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The relationship between pension funds and dividend payout : evidence from UK firms

Hassan, Nor

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THE RELATIONSHIP BETWEEN PENSION FUNDS AND DIVIDEND PAYOUT: EVIDENCE FROM UK FIRMS

NOR LAILI HASSAN

Supervised by:

PROFESSOR LYNN HODGKINSON

PROFESSOR OWAIN AP GWILYM

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List of Abbreviations

Abbreviation	*Meaning*
UK	United Kingdom
US	United States of America
ACT	Advance Corporation Tax
SIP	Statement of Investment Principle
FID	Foreign Investment Deposit
IRB	Inland Revenue Board
VIF	Variance Inflation Factor

Definition of Variables

Full sample (prior and post 1997 period):

$$Pfownit = \beta o + \beta 1\, Divit\text{-}1 + \beta 2 Sizeit + \beta 3 Growthit + \beta 4 Riskit + \beta 5 Levit + \beta 6 Abreturnit + \beta 7 Divstabit + \beta 8 Divi(t\text{-}1) X\, Dumbtxijt + e\, it \quad (3.1)$$

Sample post 1997 period:

$$Pfownit = \beta o + \beta 1 Pfowni(t\text{-}1) + \beta 2\, Divit\text{-}1 + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 98 ivstabit + e\, it \quad (3.2)$$

Variables	**Definition**
Pfown	Pension fund ownership is defined as the aggregate number of shares of stocks i owned by all pension funds in the sample at 31st December of year t, divided by the total number of shares of stock i as at 31st December of year t.
Div	Dividend variable is defined as (1) dividend yield at year t-1 which is the ratio of the firm's annual dividend at year t-1 to stock market capitalisation of the firm at year t-1; and (2) dividend to book value which is the ratio of the firm's annual dividend at year t-1 to book value of the firm at year t-1. This model uses last year's dividend rather than current dividend due to an assumption that the decision to increase or decrease the pension funds investment might take a period to take effect considering the influence of dividend payout.
Size	Firm size is proxied by log market capital.
Growth	Growth opportunity is defined as the market to book ratio.
Risk	Risk is defined as standard deviation of return of stock.
Lev	Leverage is the ratio of total debt to equity.
Abreturn	Abnormal return is the annual return on the stock in year t minus the beta return of the stock.
Divstab	Stable increases in dividend is the dummy equals 1 if the dividend per share is continuously increases for five consecutive years, otherwise 0.
Div X Dumbftx	Period dummy is for periods prior and post 1997 where the dummy equals 1 if the period is before Jul 1997 and 0 otherwise. Dividend at year t-1 multiplied by period dummy.

Notes: Subscript i in the regression index the firm and t denotes the year. The period dummy j divides the sample into two different periods.

$$\Delta Pfownit = \beta o + \beta 1 Pfowni(t-1) + \beta 2 \Delta Divi(t-1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\ it \quad (3.3)$$

Variables	Definition
ΔPfown	Change in pension funds is defined as a change of pension fund ownership at year t and year t-1.
ΔDiv	Change in dividend is defined as a change of last year's dividend. Dividend variable is defined as: (1) dividend yield; and (2) dividend to book value.
Size	Firm size is proxied by log market capital.
Growth	Growth opportunity is defined as the market to book ratio.
Profit	Profit is defined as return on equity (ROE).
Risk	Risk is defined as standard deviation of return of stock.
Lev	Leverage is the ratio of total debt to equity.
Abreturn	Abnormal return is the annual return on the stock in year t minus the beta return of the stock.
Divstab	Stable increase in dividend is the dummy equals 1 if the dividend per share is continuously increases for five consecutive years, otherwise 0.

Notes: Subscript i in the regression index the firm and t denotes the year.

$$Divit = \beta o + \beta 1\ Divi(t\text{-}1) + \beta 2 Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit\ t + \beta 7 Levit + e\ it \quad (3.10)$$

Variables	**Definition**
Div	Dividend variable is defined as: (1) dividend to book value ratio at year t which is the ratio of the firm's annual dividend at year t to book value of the firm at year t; (2) dividend per share at year t, which is the annual dividends divided by the number of shares outstanding; and (3) dividend to earnings which is the ratio of the firm's annual dividend at year t to earnings at year t or equivalently dividends per share at year t divided by earnings per share
Pfown	Pension fund ownership is defined as the aggregate number of shares of stocks i owned by all pension funds in the sample at 31st December of year t-1, divided by the total number of shares of stock i as at 31st December of year t-1.
Size	Firm size is proxied by log market capital.
Growth	Growth opportunities is defined as the market to book ratio
Profit	Profitability is defined as return on equity (ROE) which is a ratio of net income to average common stockholder's equity.
Liquidity	Liquidity is defined as current ratio which is a ratio of current assets to current liabilities.
Lev	Leverage is the ratio of total debt to equity.

Notes: Subscript i in the regression index the firm and t denotes the year.

$$\Delta Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 \Delta Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\, it \quad (3.11)$$

Variables	Definition
ΔDiv	Change in dividend is defined as a change of dividend at year t and year t-1. Dividend variable is defined as: (1) dividend to book value value; (2) dividend per share; and (3) dividend to earnings.
ΔPfown	Change of pension fund ownership as a change of last year's pension fund ownership.
Size	Firm size is proxied by log market capital.
Growth	Growth opportunities is defined as the market to book ratio.
Profit	Profitability is defined as return on equity (ROE) which is a ratio of net income to average common stockholder's equity.
Liquidity	Liquidity is defined as current ratio which is a ratio of current assets to current liabilities.
Lev	Leverage is the ratio of total debt to equity.

Notes: Subscript i in the regression index the firm and t denotes the year.

Abstract

This study examines the relationship between dividend and pension funds holdings using a sample of non-financial firms listed on the London Stock Exchange for the period of March 1997 to December 2008. March 1997 data are included since this was the only period for which ownership data was available prior to an important change in taxation. The study questions whether pension funds are attracted to firms with high dividend payouts and examines whether pension funds appear to be: (1) recipients of managerial decision making, or (2) in a position to influence decision making. Based on UK evidence, the study finds that whilst higher dividend payout does not appear to influence pension funds investment, a policy of stable increases in dividend for five consecutive years is significantly related to the level as well as changes in pension fund ownership. The result implies that whilst pension funds may not require dividend payouts for their investment purpose, they do expect stable increases in dividend if a firm does pay a dividend and are likely to increase their ownership when companies begin to follow a policy of stable increases in dividend payout. The beneficial taxation of dividends for pension funds was reduced when the tax credits available to pension funds prior to July 1997 were removed. This study finds, albeit using a limited time frame prior to this change, pension funds tended to invest in firms with a higher dividend payout rather than a low dividend payout. Further analysis suggests that pension funds may have some influence on firms' dividend policies when payout is proxied by dividend to book value. However, the relationship is not proven when the study repeats the analysis using dividend per share and dividend to earnings. Therefore, the study suggests that pension funds are merely recipients of managerial decision making and react positively to a policy of stable increases in dividend payout but they do not appear to influence firms' dividend policy. Overall, the study provides insights into potential explanations for the role of dividend policy in attracting pension fund investors, and for the relationship between pension funds and dividend payouts in UK.

Chapter 1: General Introduction to the Thesis

1.1 Introduction

One role of management is to provide information to shareholders. The dividend signalling hypothesis purports that dividend payout plays a significant role in this respect. Allen and Michaely (2002), amongst others, argue that dividends convey information about a firm's prospects, and other information not previously known to the market, while ap Gwilym (2006) points out that predicting future returns from the payout ratio is problematic. Allen, Bernardo and Welch (2000) state that institutions prefer high dividends, but give two non-signalling related reasons for this preference. Firstly, they argue that institutions may be less likely to be sued by investors for investing in high dividend-paying firms, as the Court may consider such investments more prudent; and secondly, dividends paid to institutional investors often have a relative tax advantage.

This study examines the relationship between dividend payout and pension fund holdings using a sample of non-financial firms listed on the London Stock Exchange for the period of March 1997 to December 2008. Data for March 1997 data is included since this is the only period for which ownership data was available prior to an important change in taxation regulation. The study questions whether pension funds are attracted to firms with high dividend payouts and examines whether pension funds appear to be: (1) recipients of managerial decision making; or (2) in a position to influence decision making. Based on UK (United Kingdom) evidence, the study finds that whilst higher dividend payouts does not appear to influence pension funds investment, a policy of stable increases in dividend for five consecutive years is significantly related to the level as well as changes in pension fund ownership. The result implies that whilst pension funds may not require dividend payouts for their investment purposes, they do expect stable increases in dividend if a firm do pay dividends; and are likely to increase their ownership when firms begin to follow a policy of stable increases in dividend payout. The beneficial taxation of dividends for pension funds was reduced when the tax credits available to pension funds prior to July 1997 were removed. This study finds, albeit using a limited time frame prior to this change, pension funds prefer to invest in firms with a higher dividend payout policy compared to firms a low dividend payout policy. Further analysis suggests that pension funds may have some influence on

firms' dividend policies when payout is proxied by dividend to book ratio. However, this relationship is not proven when the study repeats the analysis using dividend per share and dividend to earnings. Therefore, the study suggests that pension funds are merely recipients of managerial decision making and react positively to a policy of stable increases in dividend payout but do not appear to influence firms' dividend policy. Overall, the study provides possible explanations for the role of dividend policy in attracting pension fund investors, and for the relationship between pension funds and dividend payouts in the UK.

The study firstly concludes that pension funds tend to hold stocks in firms paying dividends rather than non-dividend paying firms; the study however, does not find, using both parametric and non-parametric tests, a preference for firms paying high dividends. Instead, pension funds invest more in lower dividend paying firms. Greinstein and Michaely (2005) also report that some institutional investors actually prefer low-dividend to high-dividend stocks. However, when the hypothesis is tested for stable and non-stable increases in dividend group of firm using both parametric and non-parametric test, the results show that pension funds might actually prefer to invest in firms paying stable increases in dividend rather than non-stable increases in dividend paying firms.

The above tests ignore any other factors which might influence pension fund ownership. Therefore, the next analysis further discusses the relationship between the variables applied in this study using regression analysis. The first hypothesis[1], stated in alternative form, examines, simply, whether pension funds tend to hold high-dividend paying stocks and disregards causality. The second hypothesis tests the causality effects on whether pension funds increase their investment following an increase in dividend payout[2]. The study rejects both hypotheses, thus concluding that dividends may not influence pension funds investment based on panel data regression analysis. However, in line with parametric and non-parametric tests reported earlier, stable increases in dividend payout is significantly and positively related to the level of pension fund ownership.

Prior to July 1997, the UK pension funds, along with other tax exempt investors, could reclaim tax credits attached to dividends; hence, £1 of net dividends, was worth £1.47, with the imputation rate was 30% for example, see Hodgkinson *et al.* (2006). Tax exempt

[1] The study uses level of this year's pension funds ownership as dependent variable and level of last year's dividend as independent variable.

[2] The study uses this year's changes of pension funds ownership as dependent variable and last year's changes of dividend as independent variable.

investors lost the right to reclaim the tax credit following the UK Finance (No.2) Act 1997. It was expected, a priori, that pension funds would have held a high proportion of stocks with a high dividend payout prior to this change in legislation, but pension fund ownership in high dividend paying stocks may have subsequently declined due to their decrease in value. Consistent with the theory (i.e. dividend clientele theory), the relationship between pension fund ownership and dividend payout is significantly more positive prior to the change in legislation. Hodgkinson *et al.*, however, report a Chief Executive Officer of a listed firm confirming that institutional investors will still require dividends following the change and especially during periods of falling stock prices when capital gains are more limited.

A previous study in the United States (US) by Baker and Wurgler (2004) suggest that payments of dividends might only be made in response to demands from investors[3]. The next stage of the study examines whether a positive relationship exists between last year's pension fund ownership and this year's dividend payout and whether firms increase their dividend payout subsequent to pension fund investment. The results show a significantly positively relationship between level of dividend payout and the previous year's level of pension fund ownership. However, the result holds only for dividend to book value as a proxy for dividend payouts but not for dividend per share and dividend to earnings. However, further test using changes of dividend shows that an increase in pension funds may not prompt a dividend increase, suggesting no pressure from pension funds to increase the dividend payout.

Overall, the study provides possible explanations for the role of dividend policy in attracting pension funds investors, and for the relationship between pension funds and dividend payouts in the UK. This remainder of this chapter is divided into three parts. The first part discusses the research questions and the objectives of the thesis; the second part discusses the motivation for the thesis and the final part describes the structure of the thesis.

[3] They suggest that managers cater to investors by paying dividends when investors put a stock price premium on dividend-payers, and by not paying when investors prefer non-payers.

1.2 Research Questions and Objectives of the Thesis

O'Brien and Bhushan (1991) state that institutional investors require information from management, both as a basis for investment decisions and to satisfy standards of fiduciary responsibility. In particular, previous researchers such as Bhattacharya (1979, 1980); John and Williams (1985); Miller and Rock (1985); and Ofer and Thakor (1987) have shown that management uses dividends to transmit information to the capital market. They argue that dividend patterns do exist, but according to Chiang et al. (2006), signalling well-being with dividends is a limited and an unclear means of signalling. They argue that there is conflicting evidence on whether dividends signal the true worth of the firms, and whether institutional investors, such as pension funds, tend to invest in high dividend paying stocks.

If dividends play a credible signalling role, management might attract pension funds to invest in their stocks by following a high dividend payout policy. However, if dividends not effective signals, pension funds may choose to use other information for their investment decisions. Given the mixed evidence on the role of dividends in signalling, this study questions whether stable increases in dividend is also important for pension fund investment purposes.

The next question to ponder upon is whether pension funds are still attracted to dividends. Short, et al. (2002) argue that institutions will prefer dividends, as they need 'predictable' cash flows on an ongoing basis to fund their activities. Assuming that pension funds prefer high dividends, this study then questions whether they invest in companies with relatively low dividend payouts and then exert pressure on or influence management to increase those dividend payouts.

In short, this research deals with the following research questions:

1. Do dividends signal the true worth of the firm and do institutional investors such as pension funds prefer to invest in high dividend paying stocks?

2. Do pension funds prefer stable increases in dividend firms for their investment purposes?

3. Assuming that pension funds prefer high dividends, do they invest in firms with relatively low dividend payouts, and then exert pressure on or influence management to increase those dividend payouts?

Based on these the research questions, the following are the objectives of the:

1. To determine whether pension funds are attracted to firms with high dividend payouts.

2. To determine whether pension funds are attracted to firms with stable increases in dividend payouts.

3. To determine whether pension funds, even if not initially attracted to high-dividend paying firms, subsequently pressure managers to change their dividend policy following their investment.

To answer the research questions, a review of the literature is undertaken to identify potential factors that might influence dividend payout. Following Grinstein and Michaely (2005) who provide a test on the US market[4], the study further develops a model of company ownership to look at the effect of dividend policy on pension fund ownership. Grinstein's and Michaely's model is enhanced by including additional variables which may be of particular concern to pension funds due to the prudent man concept. Pension funds are likely to need cash on an ongoing basis as discussed in Chapter Two (see for example, Short *et al.* 2002). Hence stable increases in dividend might be an important factor to be considered for pension funds investment decisions. In addition, the model includes a measure of leverage to reflect potential concern pension funds might have for a firm's financial risks. Finally, to address the third research question, the analysis uses a regression model to test causality and examine whether a change in pension fund ownership subsequently leads to an increase in dividend payout.

[4] The study also refers to Australian study by Graham et al. (2010).

1.3 Motivation and Significance of the Thesis

In order to attract investment from institutional investors, management might wish to choose suitable signalling tools to effectively deliver a message to investor. Previous studies[5] show that dividends might be used to signal the true worth of the firm. Several researchers[6] however have argued against this stance. Inconsistency among researchers with regard to dividend signalling, might lead pension funds to also look at other possible signals for investment purpose such as stable increases in dividend for certain period of times. By not considering dividend signalling, this does not mean that pension funds are not at all interested in high dividends. Due to the requirement for prudent investment[7], pension funds might also be interested in high dividends as an indicator of this prudence. As mentioned earlier, Allen, et al. (2000), state that one of the institutional investors' reasons for preferring dividends is that institutions are less likely to be sued by investors if their portfolios consist of firms that pay higher dividends, since the court considers these firms to be more prudent investments.

From another perspective, Short, Zhang, and Keasey (2002) argue that institutions will prefer dividends as they need 'predictable' cash flows on an ongoing basis to fund their activities. Therefore, institutional investors, such as pension funds, regardless of the tax bias, are in favour of dividends. In their theory, institutional investors cannot just rely on capital gains to fund their liabilities and, for this reason, require dividend payments. This scenario might lead institutional investors to try to influence the management to pay high dividends after they have invested in the firm. Currently, there is no conclusive evidence in the UK market with regards to institutional investors influencing firms' dividend policies. Therefore, this study will contribute to the knowledge about whether pension funds have an ability to influence firm dividend policy.

In particular, it is interesting to explore the pension funds investment practice in the UK since the tax reform in 1997. Before the tax changes in 1997, pension funds in the UK had a tax advantage due to the tax credit accompanying dividends given to tax exempt institutional investors. Pension funds in the US, however, do not get a similar advantage due

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5 For example, John and William (1985), Miller and Rock (1985), and Ambarish, John, and William (1987) suggest that managers use dividends to signal a firm's future prospects (profitability).

6 Benartzi, et al. (1997) show that there is no clear relationship between dividend changes and future earnings growth, as they conclude that dividends predict the past and not the future growth. In different views, dividend might not easy to signal firm performance as stated by Peterson (1996) that competition among firms creates noisy dividend signals.

7 Pension Act 1995.

to the different tax system applied there. According to Morgan and Thomas (1998), the **s**ignificant differences that exist between the British and American tax regimes' treatment of dividend income and capital gains is that the US operates a 'classical' company tax system whereas UK operates a partial 'imputation' company tax system. The 'classical' company tax systems, treats shareholders and corporations independently when calculating their tax liabilities. Accordingly, the profits generated by a firm are subject to a corporation tax rate, which is not taken into account when assessing the tax owed by shareholders. When a firm distributes profits by making a dividend payment, the shareholder is taxed at his marginal income tax rate whereas, when profits are retained by the firm, the value of the shareholder's equity rises and becomes subject to capital gains tax. In other words, the firms pay a flat rate of corporation tax on their profits and shareholders pay income tax on the dividend income they receive at their marginal rate of income tax. Under the classical tax system, therefore, profits are subject to double taxation, either in the form of corporation tax and income tax (in the case of distributed profits), or as corporation tax and capital gains tax (in the case of retained profits). This also means that dividends are essentially taxed twice, firstly, in the form of corporation tax on firm profits, and secondly, in the form of income tax on dividend income. An important outcome of the classical system is that both basic and high rate income taxpayers may prefer profits to be retained by the firm rather than paid out in dividends, with tax-exempt shareholders being ambivalent between dividends and retained profits.

On the other hand, under a partial imputation tax system, a corporation tax is charged on firm profits but part of the corporation tax paid is taken into account when assessing shareholders' income tax. A partial imputation system means that part of the corporate tax paid can be offset against personal tax obligations. In other words, corporate tax can be imputed against personal tax obligations on dividend income[8]. This effectively removes the double taxation of dividends that exists under the classical tax system discussed earlier. In short, when a dividend is paid out of corporate profits that have been taxed at the statutory corporate tax rate, the shareholder receives the cash dividend plus an imputation tax credit.

Morgan and Thomas (1998) state that important outcome of the UK system is that tax-exempt shareholders prefer dividends to retentions, basic rate taxpayers are ambivalent between dividend and retentions, and higher rate taxpayers prefer retentions. They also argue, since tax-exempt shareholders, such as pension funds, are the most influential investors in

[8] Please refer to Appendix 1 for an illustration of an imputation system.

many UK companies, their tax preference for dividend income is likely to result in significantly higher dividend payout ratios than would be chosen by companies in the absence of this tax bias. Therefore, the bias in the system in the UK, before the tax changes in 1997, meant that tax-exempt shareholders preferred dividends to retentions, since a £ in dividends was likely to be worth more than a £ in capital gains due to the tax credit. In the same way, Bell and Jenkinson (2002) also argue that dividends were preferred by many classes of investors before the Financial Act, 1997, because tax-exempt investors, such as pension funds, were not liable to pay either income tax or capital gains tax, but were allowed the repayment of the imputation credit (20%)[9]. However, after July 1997, the attractiveness of dividends was reduced as the government changed the tax laws in such a way that all tax credits, including those paid on dividends, were abolished. Accordingly, Bell and Jenkinson (2002) suggest that after the 1997 tax changes, pension funds in the UK and the US became identical, at least in terms of their tax treatment. A previous US study by Grinstein and Michaely (2005) on the relationship between institutional investors and dividend policies shows that institutional investors are not attracted by high dividends and are not in the position to influence the dividend policy.

Grinstein and Michaely (2005) focus on the relationship between institutional investors and dividends in the US market. This study, however, will look at the UK market to understand the relationship between dividends and institutional investors, specifically,

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[9] "On paying a cash dividend, UK firms were obliged to pay a proportion of the dividend in tax which is advance corporation tax (ACT). Subject to restrictions (principally that the dividend did not exceed UK taxable profit), the ACT could be credited against the main corporation tax charge, and thus generally only affected the timing of corporation tax payments. In addition however, UK shareholders could also claim a credit against the UK income tax due on the receipt of the dividend. In general, ACT was charged at the basic rate of income tax (20 percent for dividend income in 1997) on the grossed-up dividend (ie the cash dividend plus the ACT). Hence basic rate shareholders were deemed to have paid tax in full on any dividends received, and consequently did not have to pay any further tax. Higher rate taxpayers, whose marginal tax rate was 40 percent, had to pay additional tax. For a £100 cash dividend, they had to pay tax on the grossed-up value of £125, i.e a total of $50, but they could offset against that the £25 tax credit, leaving them with another £25 to pay".

Source: Bond S.R, Devereux, M.P., Klemm, A. (2007) The Effects of Dividend Taxes on Equity Prices: A Re-examination of the 1997 U.K. Tax Reform, IMF Working Papers, (30) 5.

pension funds. Therefore, a point worth investigating in this study is to see whether a similar pattern exists in the UK market with regard to investment practice by institutional investor such as pension funds after the tax changes in 1997. It is important to look at the UK market because of the different environment in the UK market in comparison to that of the US. ICAEW (2007) page 12[10], reports the following statement:

"UK shareholders are more collegial in their engagement than their US counterparts and in particular the UK regulatory environment permits dialogue between boards and investors by not presuming that such dialogue represents privileged disclosure which is restricted by regulation Fair disclosure in the US".

The above statement suggests that investors in the UK may have more opportunities to have discussions with the management of firms. On top of this, Hendry et al. (2007) suggest that UK investors have an advantage in the UK system, since there is a view that the UK system is relatively transparent and that most managers do manage their companies for their shareholders. With these different environments, and the position of pension funds as one of the major influential investors in the UK market[11], the current study will provide additional knowledge about dividend signalling theory and pension fund behaviour. In short, this study will add to the literature on the importance of institutional investors (in this case pension funds) and provide an insight into potential explanations for how firms pay and change their payouts over time in the UK market. Our findings should be of interest to regulators of markets with similar investment rules and to pension fund participants.

[10] Institute of Chartered Accountants in England and Wales (ICAEW, 2007). Dialogue in corporate governance. Beyond the myth of Anglo-American corporate governance. Findings. Emerging Issues. ICAEW. London.

[11] The Hampel Report (1998) states that about 60% of shares in listed UK companies are held by institutions such as pension funds, insurance companies, unit and investment trusts. The ONS (2004) reports that institutions are an important investor in the UK market, as around 80% of UK equity is held by financial institutions, primarily by insurance companies (17.2%), pension funds (15.7%) and overseas institutional investors (32.6%). Kay (2012) also highlights the important role of pension funds in UK maket.

1.4 Thesis Structure

The thesis is organized as follows:

I. Chapter Two provides a review of the related literature. Firstly, the thesis discusses the dividend signaling theory and addresses the role of dividends in signaling firm's quality. Secondly, the discussion moves on to previous work related to institutional investors, including the relationship between pension funds and dividend policy. The third section discusses the other factor which might attract institutional investors. Finally, the last section provides an overview of previous work on determinants of dividend policy.

II. Chapter Three explains the development of the hypotheses of the study and research methodology adapted for the study. Firstly, the chapter provides discussion on the development of the hypotheses of the study relates to pension funds and companies with high dividend payouts, and the potential requirements for increases in dividend. Secondly, the chapter describes the data, discusses the methodology adapted and explains the process of hypothesis testing to achieve the objectives of the study. The study uses an ownership regression model and dividend regression to test the hypotheses. The final section summarizes and concludes the chapter.

III. Chapter Four discusses findings on the effect of last year's dividends on this year's pension fund ownership. The first section provides the descriptive results of the study. The second section discusses the regression results with relation to the hypotheses on whether a positive relationship is proven between last year's dividend payout and this year's pension fund ownership, and whether a positive relationship is proven between stable increases in dividend and pension fund ownership. The third section discusses the regression results on whether pension funds increase their investment following increase in dividend payouts. The final section summarizes the results.

IV. Chapter Five discusses findings on the effect of pension fund ownership on dividend payouts. The first section provides the descriptive results of the study. The second section discusses the regression results with relation to the hypotheses on whether a positive relationship is proven between pension fund ownership and dividend payout. The third section discusses the regression results on whether pension funds increase

their investment following increase in dividend payouts. The final section summarizes the results.

V. Finally, Chapter Six concludes the thesis. This chapter provides a summary of the main results and examines to what extent these results contribute to the existing literature. This section also discusses the limitations of the thesis and provides suggestions for future research.

Chapter 2 : Literature Review

2.1 Introduction

Institutional investors play a major role in the UK market and a few researchers have argued a firm's dividend policies might be influenced by the management's relationship with institutional investors. This chapter reviews the relevant literature and emphasises the findings of previous studies. This chapter begins by discussing the role of dividend policy from a number of different perspectives, including the influence of institutional investors. The first research question addressed is whether dividends play a signalling role and attract institutional investors, including pension funds, to invest in high-dividend paying stocks. Therefore, an important focus of this chapter is the role of dividends in signalling firm information to investors. The second research question is whether or not institutional investors prefer firms with stable increase in dividend for their investment purposes. Assuming that pension funds prefer high dividends, the study addresses the next question as to whether they invest in companies with relatively low dividend payouts but then exert pressure or influence management to increase those dividend payouts. The study therefore discusses the related literature on pension funds and its characteristics to understand the nature of pension funds and investment in the UK.

Accordingly, five strands of literature are discussed. Section 2.2 presents an overview of the literature on dividend irrelevancy, dividend clienteles, agency theory and roles of dividends in reducing free cash problems; section 2.3 addresses the role of dividends in signalling information; section 2.4 discusses the role of dividends in attracting institutional investors; section 2.5 provides an overview of the UK dividends and taxes over the last fifteen years; and finally, section 2.6 discusses other factors that might attract institutional investors.

2.2 Review of Dividend Theories

According to A Dictionary of Accounting (2010)[12], dividend policy is the policy that determines the extent to which profits should be distributed in terms of dividends to shareholders. In the case where firms decide to pay a low dividend, at that point, more funds can be retained for reinvestment. The implication is that the company has to rely less on other sources of long-term funding to finance its projects. The opposite is also true when firms that pay out a high percentage of current earnings will have less retained earnings, and hence less capital to fund growth in earnings and dividends. Investors purchasing shares may expect to receive dividends as part of their investment. It is reasonable to think that a firm should give investors part of the profit. The question is how much of available cash should firms pay out as dividends, and how much should it retain and reinvest. Perhaps, the shareholders may be better off if the firm retains all profit and foregoes dividend. Some investors may prefer investing in shares of firms that pay high dividends, whereas others prefer to invest in those that pay lower dividends. Since dividends may affect a firm's investing and financing plans; therefore, managers might construct a practical dividend policy throughout the planning phase.

Many studies have been conducted to discuss the issues of dividend policy. One of the first studies on dividend policy was by Lintner (1956). Based on survey findings among US firms, Lintner built a behavioural model of dividend policy and suggested three conclusions on dividend policies. Firstly, firms generally target a specific dividend payout ratio; secondly, firms offer smooth dividend payments over time since managers trust corporations that follow a stable dividend policy that may attract investors; and finally, managers focus more on changes in dividends compared to the levels of dividends. Lintner further argues that firms also pay out dividends in accordance with their levels of earnings. Additionally, he finds that the managers will increase dividends only if they believe a permanent increase in earnings rather than short-term increase in earnings. Overall, the study concludes that dividend policy is driven by the long-run target payout ratio as well as the speed of adjustment towards the target dividends. However, recent study by Leary and Michaely (2011) suggest that the

[12] Sources from A Dictionary of Accounting. Ed. Jonathan Law and Gary Owen. Oxford University Press, 2010.

smoothing policy is not the same for all firms. While younger[13] firms smooth less, the firms that subject to agency conflict smooth more.

The dividend irrelevance theory proposed by Miller and Modgliani (1961) is not in line with Lintner's as they suggest that, in a perfect world[14], dividend distribution may not influence the value of a company as well its share price. Emery and Finnerty (1997) describe a perfect capital market as one in which there are no barriers to entry that would keep any potential suppliers or users of funds out of the market; there is perfect competition; financial assets are infinitely divisible; there are no transaction costs; no tax asymmetries; no government or other restrictions on trading; and all existing information is fully available. The irrelevance argument suggests that even though managers properly choose a dividend policy for their firms, however the chosen policy has no beneficial impact on shareholder wealth. Thus, all dividend policies are equal. However, Lintner's result is not surprising because in the real world (allowing market imperfections), the tax characteristics of investors, as well as the difference in taxation for dividends and capital gains, may sway towards tax-induced dividend clienteles[15]. According to Miller and Modigliani's propositions with regards to dividends, the price of the stock (ex-dividend) at the end of the period might decrease by about the same amount as the increase in the dividends or the firm value will not be affected for the period of ex- and post-dividends. In other words, a firm's dividend policy is unrelated to a firm's value. This is true when a higher dividend would demand more sales of stocks to increase finances for the investment programme. Based on the assumption that the future market value will continue to be unaffected by current dividends, there is no

[13] Younger firms, smaller firms, firms with low dividend yields, firms with high earnings volatility and return volatility, and firms with less analyst following and more dispersed and less accurate analyst forecasts all smooth less.

[14] The basic assumptions discussed by Miller and Modigliani (1961) in their study to explain the "perfect world" are as follows:
"In 'perfect capital markets', no buyer or seller (or issuer) of securities is large enough for his transactions to have an appreciable impact on the ruling price. All traders have equal and costless access to information about the ruling price and about all other relevant characteristics of shares. No brokerage fees, transfer taxes, or other transaction costs are incurred when securities are bought, sold, or issued, and there are no tax differentials either between distributed and undistributed profits or between dividends and capital gains. 'Rational behaviour' means that investors always prefer more wealth to less and are indifferent as to whether a given increment to their wealth takes the form of cash payments or an increase in the market value of their holdings of shares. 'Perfect certainty' implies complete assurance on the part of every investor as to the future investment program and the future profits of every corporation. Because of this assurance, there is, among other things, no need to distinguish between stocks and bonds as sources of funds at their stage of the analysis. Therefore, proceed as if there were only a single type of financial instrument which, for convenience, they refer to as shares of stock."

[15] "The clientele hypothesis suggests a relationship between firms' dividend policies and investor characteristics."

specific advantage for any one dividend policy which the firm might decide on. Thus, there is no difference for investors to choose either dividends or capital gains[16].

Tax clientele hypotheses use the market imperfection caused by differences in the taxation of dividends and capital gains to explain the dividend puzzle[17]. A previous study by Elton and Gruber (1970) supports clientele effect theory. The study investigates the ex-dividend behaviour of all stock (stocks which paid a dividend for the period April 1, 1966 to March 31, 1967) listed on the New York Stock Exchange. Elton and Gruber argue that each individual has a different marginal tax rate due to his identity. Therefore, this scenario encourages a clientele effect in a way that investors may choose to invest in firms which follow dividend policies that can meet their requirements. Accordingly, their study provides evidence that suggests stockholders in higher tax brackets show a greater preference for capital gains over dividend income, relative to those in lower tax brackets[18].

In line with Elton and Gruber's study, Black and Scholes (1974) also suggest that in practice, the clientele effect might happen. While some individual investors favour cash dividends, others, for certain tax reasons, do not prefer cash dividends. They find that a corporation might not fear the effect of its stock price when they increase its dividend. The corporation may experience temporary change of its stock price in response to a change in the dividend, because the market may believe that the change indicates something about the probable future course of earnings. If it becomes clear that the change was not made because of any change in estimated future earnings, this temporary effect should disappear. Thus, they conclude that changes of dividend policy will have no permanent effect on its stock price. Accordingly, a corporation that needs to decide on its dividend policy may simply rely on

[16] "Since the dividend policy of a firm does not affect its current price, shareholders are therefore, indifferent toward retention of net income and the payment of dividends. What shareholders gain through increased dividends, is offset exactly by the value in the end of period price of their shares. It is the availability of external financing in a world without transaction costs that makes the value of the firm independent of its dividend policy."

[17] Miller and Modigliani (1961) proposed dividend irrelevance theory that suggests in a perfect world, dividend distribution may not influence the value of a company as well its share price. However, researchers suggest different competing hypotheses as to why firms are willing to pay dividends and why investors still look for dividends (dividend puzzle). In assessing the contributions provided by researchers, Black (1976) concluded, ''The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just do not fit together".

[18] In case where dividends and capital gains are taxed at a different rate, a different preference might take place for either dividend income or capital gains. It can be argued that firms should not pay a dividend but reinvest the income to allow the investor a higher after tax income in case where the tax rate on dividend income is higher compared to capital gains.

that assumption. In case where a corporation has a continuing need for new capital, Elton and Gruber suggest that a corporation may decrease its dividends since it would be a very economical way of providing that capital. From another perspective, a corporation may decrease dividends to satisfy the majority of shareholders in case where it is believed that the majority of shareholders who initially prefers dividends for any reasons they may have to favour dividends but not anymore due to the tax disadvantages of dividends.

A study by Scholtz (1992) provides an empirical model that openly tests the dividend clientele hypothesis based on individual portfolios data extracted from the 1983 Survey of Consumer Finances in the US Market. An interview was conducted with 4,144 households representative of 84,748,382 households in the United States. The study shows that dividend clienteles seem to form as a result of investor tax characteristics. Scholtz describes that the nature of dividends, being regular payment as well as immediately liquid, provides advantage for dividends to attract investors. This is true when an investor has to at least take time and pay brokerage fees in order to convert shares of stock into cash. For smaller sales of stock, the fees might be a major proportion of the total sales since they regularly consist of a fixed component. The disadvantage of dividends is that the tax payers who have higher dividends face a higher marginal tax rate on dividends than on capital gains. Therefore, the decision whether to invest in high or low yield securities, must also be based on the transaction costs incurred while investors convert shares of stock into capital gains, since they may not solely rely on the tax advantage of capital gains. In short, the tax rate is an important basis for investors to choose their portfolio dividend yields[19]. However, they further argue that individual investors are not likely to have much information and fewer resources compared to professional managers[20]. Thus, individual investors, when making portfolio decisions, may not be too sensitive to taxation.

A study by Baker and Wurgler (2004) is also related to clientele theory and, among other findings, they suggest that dividend payments are made in response to demands from

[19] Based on US Federal Tax system, most individuals are taxed more heavily on dividends than capital gains. While the 1986 tax reform equalized the tax rates on ordinary income and realized capital gains, capital gains in general remain tax-preferred because they are taxed when realized rather than when accrued and because the basis of bequeathed assets is increased to market value at the time they are passed on, effectively eliminating capital gains taxes at death. Because dividends are relatively tax-disadvantaged, one might expect firms with high dividend payout ratios to attract investors with relatively low marginal tax rates. Similarly, high marginal tax rate investors might be expected to purchase the securities of low-dividend-yield firms, all else being equal.

[20] There may be several types of investors in a firm. These include managers of other corporations, pension funds, and non-profit institutions as well as individual investors.

investors. They suggest that managers will pay dividends when investors prefer dividend-payers, but not pay when investors prefer non-payers. Using constructed four stock price-based measures, they tested their prediction of investor demand for dividend payers. The result shows that for each measure, whenever demand is high, the non-payers are likely to initiate dividends. For some of the measures, whenever demand is low, dividend-payers have a tendency to omit dividends. Therefore, they conclude that the investor demand for dividend-payers is a motivational factor for managers to pay dividends. Accordingly, the presence of a non-neutral tax, or changes in tax regulations, will motivate firms to increase or decrease dividends or to substitute them with a share repurchase. In line with Baker and Wurgler's finding, Dhanani (2005) suggests that shareholder requirements are a significant factor when formulating dividend policies. He considers that shareholders' needs are very likely to be important given that the existence of certain tax benefits will influence the investors' preferences towards dividends or share repurchases. This scenario is also reported in a study by Rau and Vermaelen (2002), who show that high-tax individuals tend to prefer share repurchases to dividends but low-tax individuals are indifferent between the two[21].

The existence of dividend clientele was tested by Bajaj and Vijh (1990) in the US market using dividend declarations and daily returns data for the period of July 1962 to December 1987. Basically, the study anticipated yield affects the price reactions to dividend announcements in a way consistent with dividend clientele. They propose that among others, the reason that may explain the price reactions to dividend change announcements is the existence of dividend clienteles. Under this hypothesis, the price reaction to a firm's dividend change announcement is influenced by the yield preferences of the marginal investor in that firm's shares. Investors in low-yield firms, who have a relatively high aversion to dividends, will view an increase in dividends negatively, ceteris paribus, while investors in high yield firms, who place a higher value on dividends, will react positively[22]. Consequently, the market reaction to a dividend change will be related to the firm's dividend yield. Therefore they interpret this as evidence in favour of the dividend-clientele hypothesis.

[21] Rau and Vermaelen (2002) showed, in their UK study, that high-tax individuals tend to prefer share repurchases to dividends (unless the share repurchase would generate a substantial capital gains tax liability) but, ceteris paribus, they would prefer an off-market repurchase (tender offer or private purchase) to an open-market buyback.

[22] The result shows the larger price reactions to dividend changes and the clientele effect is stronger for stock that is low-priced and small-firm. Based on their sample, the average price reaction to dividend decreases is only -0.53% and -2.57% for the low-yield group and high-yield group respectively. For the increased dividend group, the corresponding averages are 0.63% and 1.53%.

Previous discussion refers to the tax hypothesis which rests on the assumption that there will be no difference between selling shares cum- and ex-dividend for marginal stockholders, and therefore, the drop in price, must in equilibrium, reflect the relative dividend and capital income tax rates of the marginal investors. However, research such as by Kalay (1982) is not in line with the tax hypothesis as he argues that traders by arbitrageurs drive stock prices on the ex-dividend day, not clienteles. The study is established on the assumption that investors who are risk-neutral and are indifferent between an equal amount of pre-tax capital gains and dividend income might be able to realize arbitrage profits through short-term trading, if the price on the ex-dividend day and the value of dividends is different. Another research by Rantapuska (2005) however, suggests that the differences in tax rates as well as arbitrage opportunities might influence the decision to trade around the ex-dividend day.

The above discussion relates dividend policies to a clientele effect. However, the accumulated evidence on the effects of dividend policies argues in favour of other theories as well. Firstly, even though Miller and Modigliani (1961) suggest that dividend policy should not have any impact on firm value under the usual perfect capital market, asymmetric information between managers and the markets may allow dividends to act as a signalling tool for managers to communicate insider's information to outsiders. Signalling theory argues that managers might signal information to investors through changes in dividends. Essentially, the management of the firm plays an important role in providing information to outsiders, and choosing different methods of signalling the company's quality is a major concern. Previous research, such as Bhattacharya (1979, 1980); John and Williams (1985); Miller and Rock (1985) and Ofer and Thakor (1987), suggest that dividends have been used by management to deliver information to the capital market. Specifically, they show that a dividend increase (decrease) is viewed as a positive (negative) signal for the firm's position in the future. Therefore, dividends can be a signalling tool to manage the information asymmetry between managers and shareholders. Section 2.3 further discusses the dividend signalling theory.

Another reason why managers pay dividends is related to agency theory. The potential conflict of interest among corporate managers and outside shareholders contribute to the development of an agency theory. Essentially, Jensen and Meckling (1976) describe an agency relationship as a contract between the principal and the agent of the company. One

party (the principal) might engage with another party (the agent) to complete some service on their behalf; for instance, the principal might give some decision making authority to the agent. Similarly, Brennan (1995b) suggests that there is no possibility for having a perfect contract for all potential action taken by an agent due to the conflict that may arise when decisions may affect both his own welfare and the welfare of the principal. This scenario, therefore, may contribute to the agency problems. A specific example of how agents can control corporate assets for their own purposes was described by Shleifer and Vishny (1997). Insiders may divert corporate assets over and be done with outright theft; through dilution of outside investors' shares, for instance, issuance of shares to insiders; excessive salaries for themselves; sales of corporate assets at favourable prices to either themselves or other corporations/entities they control; or be involved in transfer pricing with other corporations/entities they control. Furthermore, Baumol (1959) and Jensen (1986) also report evidence that insiders may use corporate assets to carry on with investment, which they can control for personal benefits; for instance, to proceed with growth or diversification, even though outside investors may not benefit from such activity. Payout policy may reduce the conflict of interest between insiders and outsiders of the firm. Rozeff (1982) suggests that payout policy possibly will provide a partial remedy when a firm faces an agency conflict between managers and shareholders. If there is a requirement to approach the capital market, then it may impose discipline (self-control) on corporate managers, thus reducing the cost to monitor them. In other words, the manager will have to issue new shares to raise additional funds to invest in new profitable opportunities when the company pays high dividends. Therefore, the agency theory expects that dividends will force managers to act in the best interests of shareholders.

Basically, Jensen and Meckling (1976) suggest that the agency relationship contributes to agency cost[23], in which agency cost refers to the value lost by the shareholders that arise from conflict of interests among shareholders (outsiders) and managers (insiders). According to Jensen and Meckling, agency costs consist of monitoring costs, bonding costs,

[23] Jensen and Meckling argue that it is reasonable to assume that the agent might not always "act in the best interests of the principal" if both parties (agent and principle) to the relationship are utility maximisers. The following statement extracted from their paper further describes their argument: "The principal can limit divergences from his interest by establishing appropriate incentives for the agent and by incurring monitoring costs designed to limit the aberrant activities, of the agent. In addition in some situations it will pay the agent to expend resources (bonding costs) to guarantee that he will not take certain actions which would harm the principal or to ensure that the principal will be compensated if he does take such actions. However, it is generally impossible for the principal or the agent, at zero cost, to ensure that the agent will make optimal decisions from the principal's viewpoint."

and residual loss. The expenditures paid to measure, observe and control the behaviour of an agent by the principal, is classified as monitoring costs. Bonding costs, on the other hand, are the costs to establish and to adhere to systems which encourage agents to act in the shareholders' best interests. It can also be a cost to compensate managers if they act for their own benefit. Finally, residual loss is the agency loss arising from the conflict of interests. Since the conflict leads to agency cost, thus Jensen and Meckling posit that dividends might be a mechanism to motivate managers to reduce the costs related to the relationship between principal and agent.

Research by Easterbrook (1984) provides further support in relation to the above discussion. Easterbrook examined the signalling effects of dividends, as well as its role in reducing agency costs. Based on the assumption that firms pay dividends with the intention to reduce agency costs among shareholders and managers, he suggests that payment of dividends[24] or share repurchases require firms to acquire capital externally so that a new project can be financed, and as a result, they have to follow the discipline of the market[25]. An illustration of this situation can be seen in Kaplan and Reishus (1990). They report that managers in companies which have dividend cuts are less likely to be appointed as outside directors for other companies, as they are viewed as poor managers; this is in line with the existence of outside directors' market which values managers and their performance. The managers of the companies where dividends are reduced (perceived as poor performers) are less likely to get hold of directorships in other companies compared to managers in companies where dividends are not reduced (perceived as better performers). Kaplan and Reishus suggest that individuals who are presumed as better managers have a tendency to become outside directors in case the ability of management and performance of the firm is correlated. In line with the role of board of directors to monitor managerial decisions, the

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[24] Easterbrook (1984) assumes that the firms which provide high dividend payment might need to signal the intention of its managers to maximize the wealth of its investors and to subject him to the monitoring of capital market. Accordingly, he also believes that this action might reduce the potential for managerial self-dealing and therefore reduce agency costs.

[25] He also argues that by paying dividends, firms with high growth opportunities may force the external capital markets, and, hence additional monitoring. He also suggests that the leverage of the firms may influence the levels of dividend payment. While low levels of leverage firm may pay low dividends, firms with high leverage may pay high dividends.
Refer Fluck (1998) and Myers (2000) that present model of dividend behaviour that suggests dividend payment is performed by managers to avoid disciplinary action by shareholders.

outside director's position is preferable for better managers[26] (as they are perceived to be better in monitoring managerial decisions). Fama (1980) once suggested that the higher a manager's value in certain markets, the higher is his own firm's performance. Although the evidence provided by Kaplan and Reishus suggests that there is a positive relationship between better performing managers and the tendency to be selected as an outside director of other firms, it may not matter a great deal. This is true when the test for relationship between top executives of a poorly performing firm and losing outside directorships that they already hold, is not significant. Further tests by Kaplan and Reisus show that poorly performing managers are six times more likely than better performing managers to lose their position as directors in their own company, compared to better performing managers who are only twice as likely to be hired as outside directors.

The agency theory is closely related to the free cash flow view. Researchers like Easterbrook (1984) and Jensen (1986), posit that the free cash flow can be removed from the hands of managers through higher dividend payment, and therefore, less money is wasted by managers; such marginal investment projects may provide negative net present value (NPV). They argue that the free cash flows availability contributes to agency problems as managers might use available free cash for their own purposes, and in that way, decrease the firm value. Jensen (1986) hypothesises that the negative NPV projects might be funded by free cash flow[27]. According to this hypothesis (over investment hypothesis), in case where a firm experiences free cash flow problems, then increases in dividend payment might reduce the amount of cash estimates by the market that has potential to be wastefully invested; thus, increasing the value of firm. In contrast, the market might view differently if dividends decrease; for instance, the more negative NPV projects will be undertaken, thus decreasing the value of firm. Based on the argument that there is tendency to invest in low-return projects by firm managers with extra free cash flows available, Jensen (1986) then suggests

[26] Kaplan and Reishus (1990) also suggest that the perception of better managers is also consistent with a "passive role", where performance of outside directors owning firms (look good) may contribute to the selection of member of board of directors in other firms.

[27] Please refer to the following illustration (Jensen; 1986) on NPV:
"NPV of a project is defined as the present value of all future cash flows produced by an investment, less the initial cost of the investment. In finance, the net present value (NPV) or net present worth (NPW)[1] of a time series of cash flows, both incoming and outgoing, is defined as the sum of the present values (PVs) of the individual cash flows. In the case when all future cash flows are incoming (such as coupons and principal of a bond) and the only outflow of cash is the purchase price, the NPV is simply the PV of future cash flows minus the purchase price (which is its own PV). NPV is a central tool in discounted cash flow (DCF) analysis, and is a standard method for using the time value of money to appraise long-term projects. Used for capital budgeting, and widely throughout economics, finance, and accounting, it measures the excess or shortfall of cash flows, in present value terms, once financing charges are met".

that the continuity of dividend payment helps to dissolve cash that might be wasted in projects without value-maximisation. Obviously, the payment of dividends, is among others, the way to reduce the extent of over-investment by managers.

Previous argument focusses on the role of dividends in controlling the firm managers with extra free cash flows available. Other than that, the availability of free cash flows allows managers to work less hard as their jobs are easier if there is a supply of free cash flow. However, in order to support the company's growth, managers may need cash because with cash, companies can hire employees, make capital expenditure, or even acquire other companies. Moreover, if the cash is retained, it may decrease a company's financial distress[28] since the company can repay debts and interest. Jensen (1986), states that managers prefer to retain earnings[29] whereas shareholders prefer cash to be distributed, especially when the company has few internal positive NPV investment opportunities. He further argues that even though dividends reduce the agency costs of free cash flow in contrast to debt, they do not bring the same legally binding obligation to make payments. Thus, dividend is not an efficient way to force managers to pay out firm's cash flows. Moreover, Jensen (1986, 1993) states that retained earnings provide advantage to managers in a way that the growth contributes a greater power base, better reputation, and is able to dominate the board of directors and gain higher remuneration to reward themselves. Due to this, the conflict of interests between the two parties continues to exist.

Overall, previous studies on dividend policy provide mixed evidence[30]. Some suggest that dividend policy is related to the dividend clientele hypothesis. Some refer to agency hypothesis but not all researchers agree with the idea that dividends can mitigate the asymmetric information problem between managers and shareholders. Finally, others suggest that dividends can provide information to outsiders, and thus can be a means of signalling used by the management of the firm. The following Figure 2.1 summarizes the relevant

[28] Wruck et. al (1990) describes financial distress as the condition in which the cash flow is not sufficient to meet current obligations. The obligations may include the debts to suppliers and employees that has not yet been paid, actual or potential compensations from legal action, and borrowing agreements that missed principal or interest payments. In short financial distress can also been concluded as a condition when promises to company's creditors are broken or honoured with difficulty and occasionally bankruptcy might be led by financial distress.

[29] Jensen (1986, 1993) states that retained earning provide advantage to managers in a way that the growth in size contribute a larger power base, better reputation, and an ability to dominate the board of directors as well as reward themselves with higher remuneration.

[30] Bhattacharya (2007) provides summary for the mixed evidence.

research findings discussed in this section. The following section discusses signalling theory in more detail:

Figure 2.1: Summary for review of dividend theories findings:

Authors (Year)	Theory	Findings
Lintner (1956)	Behavioural Model	1. Firms generally target a specific dividend payout ratio. 2. Firms offer smooth dividend payments. 3. Managers focus more on changes in dividends compared to the levels of dividends.
Miller and Modgliani (1961)	Dividend irrelevance theory	Dividend distribution may not influence the value of a company as well its share price.
Elton and Gruber (1970)	Tax clientele hypotheses	Investors may choose to invest in firms which follow dividend policies that can meet their requirements.
Black and Scholes (1974)	Tax clientele hypotheses	Supports clientele effects.
Scholtz (1992)	Tax clientele hypotheses	Dividend clienteles is a result of investor tax characteristics.
Baker and Wurgler (2004)	Tax clientele hypotheses	Dividend payments made in response of demand from investors.
Dhanani (2005)	Tax clientele hypotheses	Tax benefits will influence the investors' preferences towards dividends or share repurchases.
Bajaj and Vijh (1990)	Tax clientele hypotheses	The price reaction to a firm's dividend change announcement is influenced by the yield preferences of the marginal investor in that firm's shares.
Jensen and Meckling (1976)	Agency Theory	A product of principal and Agent relationship.
Shleifer and Vishny (1997).	Agency Theory	Insiders control corporate assets for their own purposes.
Rozeff (1982)	Agency Theory	Payout policy partial remedy for agency conflict.
Easterbrook (1984)	Signalling Theory	Firms pay dividends with the intention to reduce agency costs among shareholders and managers.
Kaplan and Reishus (1990	Signalling Theory	The role of dividends to control managers.
Jensen (1986)	Free cash flow Hypothesis	Higher dividend to remove cash from managers.

2.3 Dividend Signalling Hypothesis

The dividend signalling hypothesis purports that firms use dividends to provide information to investors. As mentioned earlier, information asymmetry can exist between outside investors and corporate managers, where managers and not investors might have information relevant to the value of the firm. Managers may therefore use a change in their dividend policy for signalling the private information and may therefore reduce the information asymmetry. Referring to the asymmetric information, Bhattacharya (1979) argues that managers signal the private information they have (for example the information related to distributional support of project cash flows) through their choice of dividends. This hypothesis suggests that, the greater the increase in expected future cash flows that managers wish to signal, the higher they will increase their dividend payout. A consequence of the hypothesis is that unexpected dividend increases (decreases) will be interpreted by investors as good (bad) news and they will trade on the basis of that news, resulting in positive (negative) price changes. This scenario suggests that the Miller and Modigliani (1961) theory discussed in the previous section might not always hold true although one of their assumptions relates to information asymmetry.

The issue on dividend signalling was highlighted by Pettit (1972). Using announcement dates for all firms that changed dividends (625 firms listed on New York Stock Exchange) from January 1964 to June 1968, the study shows that dividend changes cause significant price changes. Basically, the proposition related to dividend announcement is that the changes in share price are in similar direction with the dividend announcement. Based on that proposition, the study investigated whether the levels of dividend changes deliver significant information to participants of the market and, as a result, the dividend change announcements will be used by the market to access the value of securities. The result shows that dividend changes announcements contribute significantly to market reaction. Announcements on reduction of dividends or substantial increase in dividends both received dramatic market reaction. Therefore, the result is likely to be in line with that proposition and suggests market participants may use the implicit information that comes together with the dividend changes payment announcements[31].

[31] The market described in this study seems efficient while using the information signalled by dividend announcement.

Pettit's (1972) study is based on the assumption that the dividend changes reflect the content of information. Further, a study by Aharony and Swary (1980) suggest that the changes in share price are still significantly related to the announcement of dividends, although a firm's current earnings are already known by the market. The study used 149 industrial sample firms listed on the New York Stock Exchange. The study focused on whether dividend changes for quarter period deliver information beyond that already delivered by quarter period of earnings numbers. Using only those quarterly dividends, as well as earnings announcements that were made public on different dates within any given quarter, the study was then able to differentiate earnings announcements that come first or follow dividend announcement from those that accompany them. Overall, their findings strongly support the assumption that quarterly cash dividends deliver information that is useful beyond that provided by the corresponding numbers of quarterly earnings.

Another research on dividend signalling is reported by Hodgkinson (2002). She basically examined the influence of surplus Advance Corporation Tax (ACT)[32] and its related tax effects on the behaviour of the share price with relation to dividend and earnings' announcement. The research assumed that the effect of tax might increase the cost to provide information by means of dividends. Based on that argument, the study examined the extent of investor reaction to these costs when the earnings' surprise is either positive or negative. The result suggests that the acknowledgement of the impact of surplus ACT on dividend surprise is noticeable by investors if the earnings' surprise is positive. On the other hand, the dividends' ability in signalling the information to investors seems to offset the importance of any associated tax costs if the earnings' surprise is negative. In conclusion, the study suggests that managers, in making the financial decision for their firms, should also consider the impact of taxation, as it is evidenced as being an important factor; and ignorance of the tax effect may be risky to managers.

Discussions so far highlight the investor's perception on the role of dividend signalling using the behaviour of the share price surrounding the announcement of dividends and earnings. The next discussion examines whether dividends are subsequently related to

[32] Hodgkinson (2002) provides explanation on dividend payment as follow:
"Following a dividend payment, a company pays ACT equal to the basic rate of income tax (BRIT) multiplied by the gross dividend to Inland Revenue. If the shareholder's marginal tax rate is higher than the BRIT, the shareholder pays an additional amount to the Inland Revenue, whereas if their marginal tax rate is lower, a rebate may be claimed from the IR. If the investor's marginal tax rate is equal to BRIT no further action is required.

positive shift in earnings. Several studies[33] provide models for dividend signalling based on an assumption that managers signal the future prospects for their firms through dividends. Miller and Rock (1985), among others, argue that dividend changes will reveal managers' permanent expectation of the firms'earnings, where an increase in dividends might be interpreted as estimates of higher earnings that are permanent, while reduction in dividends might signal lower earnings in the future.

Stacescu (2006) investigated the implications of the pattern of reluctance to cut dividends off managerial behaviour to support the suggestion that "dividends have something to say about earnings". The study used US data for the period 1984 through 2003. The study classified firms into five different categories[34] in every year based on the dividend change types, i.e. (1) omission; (2) decrease; (3) no change; (4) increase; and (5) initiations/resumed payments. He suggests that increases in dividends are related to the positive significant changes in average earnings (average income before extraordinary items available for common shareholders[35] over the three years). Dividend decreases on the other hand, are related to average earnings with negative changes. Further investigation showed that the pattern around changes in dividends is in line with the idea that managers have tendency not to cut dividends[36], because investors believe that there will be no significant earnings drop for the next few years when they notice the increase in dividends. The mechanism suggested in this study provides support that information on future earnings may be delivered by dividends and, based on this signalling model, dividends may help investors to forecast earnings in the future, thus supporting the proposed idea that "dividends have something to say about earnings".

The study by Healy and Palepu (1988) also examined the relation between earnings changes and dividend announcement. Basically, they examined whether dividend changes in

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[33] For example John and William (1985), Miller and Rock (1985), William (1987), and Battacharya (1999).

[34] Statescu (2006) define the types of dividend change as follows:

1. "Omission" is the "firms that pay no dividends following a year with positive dividends".
2. "Decrease" is the firms that decrease dividends per share.
3. "No change" is the "firms that keep dividends unchanged from year-1".
4. "Increase" is the firms that increase dividends.
5. "Initiations/resumed payments" is the "firms that pay positive dividends in year 0, but did not pay dividends in year -1".

[35] Refer Compustat item 237.

[36] The study suggests that the firm managers only proceed for dividends decrease if there is a requirement to do so and they will increase the dividends if they are confident that the higher level of earnings have stabilised.

policy carry future earnings information using 131 first-time dividend payer sample firms after 10 years' gap, as well as 172 sample firms which had omitted dividends after continuously paying dividends for a minimum of ten years, and the changes in dividend policy that occurred from 1969 to 1980. They suggest four conclusions from the study, i.e. (1) significant earnings increases (decreases) for minimum one year before the announcements of dividend initiation (omission); (2) when firms initiate dividends, they might experience the increase of earnings for the year of, and for two years following, in which the increases appear to be permanent. On the other hand, omission of dividends shows decline in firms' earnings only one year before the date of dividends; (3) price reactions for abnormal stocks to initiations or omissions of dividends are associated with the changes in earnings of the firms in the year of, as well as the year after the announcement of dividends[37], and (4) the reaction of the market to changes in earnings is less compared to normal in the year after announcement of dividend initiation, at least for five years after dividend omission has been announced. Therefore, initiation of dividends and omission of dividends may act as "managers' forecast" for earnings increase or decrease in the near future. The results are in line with observations reported by Lintner, in which managers refer to past, current, and future earnings while setting up the policy of dividends.

Another US study by Kao and Wu (1994) on manager behaviour, using the data for the period 1965-1986, is also consistent with Healy and Palepu's (1988) findings. They conclude that managers seem to consider earnings that are either past, current or future while making decisions on dividend policy. Two different tests were conducted to determine the information content of dividends. The first involved a test of whether changes in dividends are related to managers' unbiased forecasts of future earnings. The second test went one step further to examine whether managers have superior information about future earnings. The study provides a generalised dividend model for direct tests of the partial adjustment and signalling hypotheses. The model specifies dividends and permanent earnings relationship. A nonlinear regression method was used to estimate the model as well as to test various hypotheses. The results indicate that the dividends convey firm's earnings information for approximately the next two years following the dividend payment, and this dividend information effect appears to be concentrated in the nearest quarter. Furthermore, the results indicate that the formation of permanent earnings expectations is consistent with the rationale

[37] After controlling the changes in prior earning as well as available information to the stock market at the moment of dividend announcement, only then they conclude that the relation exists. Therefore, initiation and omissions of dividends may contribute more information for future performance of firms' earning.

that managers have superior information to develop more precise permanent earnings estimation, and may provide adjustment for dividends in response to permanent changes in earnings.

Some studies suggest that the higher stock returns might be related to higher dividends. McManus, ap Gwilym and Thomas (2004) conducted a UK study to determine the returns and dividend yield relationship using data for the period between January 1958 through December 1997. Using the payout ratio in the empirical relationship among stock returns and dividend yields, the study found payout ratio conveys signalling information, and it is greater than that of the dividend yield to explain returns. From another perspective, dividend changes may also impact stock and bond prices. Handjinicolaou and Kalay (1984)[38] conducted a study to distinguish the relative importance of two hypotheses: (1) hypothesis on information content; and (2) hypothesis on wealth redistribution (bond price behaviour surrounding announcements of dividend). Handjinicolaou and Kalay define the "information content" as a hypothesis that suggests "dividend changes convey information about the future profitability of the firm where increases (decreases) are considered good (bad) news by the market", whereas "the wealth redistribution" is a hypothesis that suggests "unexpectedly large (small) dividends redistribute wealth from the bondholders (stockholders) to the stockholders (bondholders). The positive (negative) reaction of stock prices to unexpected dividend increases (decreases) is, therefore, at least partially a result of this wealth redistribution". The prediction proposed by information content hypothesis is that the prices of the bond might positively respond to the increase in dividends but the opposite prediction is proposed by the wealth redistribution hypothesis. The result of the study suggests that the dividend increase might not impact the prices of the bond, but respond negatively to the reduction of dividends. The findings support the informational content hypothesis regarding the value of the firm and announcement of dividends. The study concludes that the information on the future profitability of the firm might be delivered by unexpected dividend changes. While positive gains from positive information accrue for the stockholders, stockholders and bondholders might share the losses from the negative information. Another study by Dhillon and Johnson (1994)[39] also focuses on analysis of the stock, bond prices and

[38] They conducted a study in the US using a sample consisting of 255 straight bonds randomly chosen from among those traded on the NYSE, providing them with 1,967 dividend announcements over the period 1975-1976.

[39] The study conducted in US market using samples that are limited to firms with stocks and bonds traded on the New York Stock Exchange (NYSE) or American Stock Exchange (AMEX) between January 1978 and December 1987.

changes in dividends. The study reports that the large increase in dividends contributes to positive reaction in the stock market but a negative reaction of the prices in the bond market. Therefore, the study also supports the hypothesis on wealth redistribution. Even though the hypothesis on wealth redistribution is supported in this study, it does not reject the hypothesis on information content.

The above discussion relates dividends to predicted earnings. However, while earnings might allow better information to be inferred when making investment decisions, it can be argued that the earnings information might not always be correct or may be confusing, due to an earnings management problem. The issue is whether dividends might play certain role in relation to firms with earnings management. Farinha and Moreira (2009) highlight this problem using 40,000 firm-year observations samples in US market over the period 1987 to 2003. The result of the study suggests that dividend payment is significant and positively related to a set of earnings quality alternative measures. The study suggests that the firms' earnings quality can be signalled by firms' dividends in which companies that are more likely to be paying dividends are the ones that are not engaged in earnings management, and with higher dividend yields, compared to other firms that pay dividends. Besides, the finding also suggests that firms with higher quality of earnings tend to be dividend payers as well as having more generous dividend policies setting. From a different perspective, Arif et al. (2011) suggest that earnings management does not act as a signalling tool for the formulation of dividend policy[40]. Therefore the investors, with the motive of having high dividend policy, might not have to rely on earnings quality for their investment.

The above discussion shows that dividends might be a useful signalling tool for a firm's management. However, some might argue against this stance. Benartzi, Michaely, and Thaler (1997), for example, argue that the firms' future earnings forecasts might not credibly be signalled by changes in dividends, since it is just minor evidence of a positive relation between changes in dividends and the changes in future earnings. Initially, the study was designed to determine whether the announcement of dividends and its information content is related to earnings in the future; however, the study was not able to confirm the relationship. The findings suggest that the relationship is strong for the past and concurrent earnings with

[40] They study on the effect of earnings management towards dividend policy using 86 listed firms in Pakistan for the year 2004 to 2009.

changes in dividends, but not for future earnings[41]. The study further examined the changes in earnings in relation to dividend changes by comparing "dividend-increasing" firms and firms in which dividends have not changed. The result suggests that "dividend-increasing" firms are less likely to experience subsequent decreases in earnings compared to firms in which dividends have not changed even with similar growth in earnings. Since the overall result suggests that dividends reflect a growth for the past and not for the future prediction, thus, the study suggests that dividend changes might deliver information about what has happened.

More interestingly, firms can use dividends in different ways. Firstly, a study by Miller and Rock (1985) takes the view that a firm can attempt to mislead investors by cutting its investments and increasing its dividends. They constructed two-period models, in which some shareholders want to sell their shares at a certain time. The findings suggest that earnings and investments are not observable. Therefore, the bad firm can cut its investment as well as pay out dividends that are considerably high in order to pretend that they are high-earnings firms. On the other hand, a good firm has to pay high dividends which is supposedly high enough to discourage the bad firms from decreasing their investments to the same level.

The role of dividend signalling may also depend on the characteristics of the firms, for instance the size of the firm. Large firms have more tendencies to signal their information through dividends, as reported by Tse (2005), based on the UK market. Initially, Tse argues that there is no requirement for large firm to use dividends as signalling tool since investors normally have confidence in large firm's announcements as well as its forecasting. Based on that argument, the study examines the pattern of dividend payout for industrial firms listed on FTSE All Share Index for the period 1992 through 1998. The study specifically examined whether the pattern of alternative payout that was observed in practice is in line with the signalling hypothesis of dividends and to determine the characteristics of the firms that tend to signal through dividends. There are five groups of payout patterns matched to the types of dividend policy, i.e. (1) "smooth"; (2) "follow earnings"; (3) "always increase"; (4) "irregular"; and (5) "pay nothing". The "smooth" payout pattern is considered as dividend signallers, which policy has potential-signalling pattern. The other payout patterns comprising "follow earnings", "always increase", "irregular" and "pay nothing patterns" are categorised as non-dividend-signaller groups, as the policy has potential-non-signalling patterns. The findings suggest that firms are not all dividend signallers and many of the firms

[41] The role of dividends to signal future earnings seem minimal in the study.

fall into the non-dividend-signaller group. Further tests show that firms that are more likely to signal firm information through dividends, tend to be large, thus supporting the assumption that only large firms are sophisticated enough as well as trusted by investors to signal. However, the results suggest that, in reality, only large firms might be sufficiently credible and sophisticated to signal in this way, since investors do not place a great deal of trust in any kind of information provided by smaller firms, including dividend signals. Above all, their study concludes that, in contrast to the basic dividend signalling model assumption that all firm managers might signal the future prospects of the firm using dividends, in fact signalling through dividends is not universally applicable to all firms. Instead, other characteristics, such as the size of the business, are likely to influence the dividend policy.

In the same vein, Allen and Michaely (2004) suggest that the dividend payouts seem to be higher in large and mature firms with available free cash flow as well as limited growth opportunities. Fama and French (2001) and De Angelo et al. (2004) also find that large, profitable firms pay more dividends than those with more investment opportunities. Lloyd, Jahera and Page (1985) and Vogt (1994) both indicate that the ratio of dividend payouts might be explained by the size of the firms. They argue that larger firms are assumed to be matured enough in nature as well as able to approach the capital market. Accordingly, larger firms do not necessarily depend on funds generated internally since additional funds can easily be raised by larger firms, therefore enabling higher dividend payment. These scenarios might again suggest that not all firms are dividend signallers. In different perspective, Baker, Chang, Dutta and Saadi (2012) conduct a survey to determine the reasons underlying a firm's decision not to pay dividends. The survey results suggest that managers in Canadian market perceive growth opportunities, low profitability and cash constraints might influence firm's not to pay dividends.

Previous discussions focus more on the normal function of dividends as a signalling tool to indicate the real future of the firm. However, some of the firms might act differently with regards to dividend cutting; for instance, a firm cuts dividends for the period of financial distress, as reported by DeAngelo and DeAngelo (1990). They conducted a study on the adjustments for policy of dividends using eighty firms listed on the New York Stock Exchange, dealing with multiple losses during for the period 1980 through 1985. The study reports that 67 percent of firms, in the first year of financial distress, go for dividend cutting and it happens in firms in which operating performance as well as profitability are declining

for the minimum period of three years. Majority of the firms are actually coping with binding debt covenants in the same year of dividend reduction. On top of that, the study also suggests that the managers might react quickly and aggressively towards reducing firms' dividends in response to financial distress, and it happens among managers for large public firms. In short, the presence of debt covenants impact the choice of dividend policy even for the largest firms. The finding thus supports the idea that the reduction of dividends is practiced among managers to avoid violations of covenants in case where the debt covenants[42] exist within the debt contract.

The research by Ofek (1993) extends DeAngelo and DeAngelo's (1990) work but focuses on firms with short-term financial distress. They basically examined the relationship of firm's capital structure with its reaction to financial distress, using 358 sample firms in which the performance is normal for one year, but turned to very poor performance in the following year. The finding shows that the firms with high leverage have more tendencies to react to short-term distress compared to the firms with low leverage. The result suggests that firms with high leverage tend to respond financially, through dividend cuts, and they do this to avoid lengthy periods of losses.

However, it is not necessarily true to conclude that firms with no dividend cuts have no problems with performance. Who would want to signal bad news? There are limitations in the use of dividends as a signalling tool for firm performance, due to agency conflicts. Agency cost, for example, assumes that firms which are not performing, will not cut dividends voluntarily to avoid the transfer of wealth to bondholders. This scenario is documented by D'Mello and Mukherjee (2001). They determined whether the timing of decisions to reduce dividends is influenced by an agency cost that arises from the conflict between a shareholder and bondholder. They classified the firms into two categories, i.e. firms that have been forced to reduce dividends (because of binding bond covenants) and firms which voluntarily reduced dividends. The results show that those firms which do not voluntarily reduce dividends are certainly facing lower level of earnings as well as higher rate of recurrence of losses[43]. The findings suggest that the forced- and voluntary- reduction firms have different practices towards reduction of dividends. In the year where voluntary-

[42] Debt covenants are defined by researcher as "the agreements between a company and its creditors that the company should operate within certain limits and it can impose quite heavy obligations, for example a company may well be forced to sell assets in order to stay within a debt".

[43] Minimum of three years prior and subsequent to the year in which announcement of dividend reduction takes place.

reduction firms experience losses, they immediately reduce dividends. On the other hand, forced-reduction firms might not immediately reduce[44] their dividends but delay until a year after going through their first loss. In addition, the finding suggests that, the forced-reduction firms might pay out possible higher firm's value to shareholders through increase of dividends in the years prior to the dividend reduction decision. Overall, the findings support the idea that poorly performing financially-distressed firms potentially do not immediately reduce their dividends but delay it to allow for transferring of wealth from bondholders to shareholders.

Meanwhile, Bhattacharyya (2007) shows that different types of managers may use dividends in different ways. Basically, the study proposes a model that shows that compensation contracts encourage retention or investment of firms' earnings by high quality managers. On the other hand, the managers who perceive low-quality, are interested to distribute income to shareholders. The finding shows that the ratio of earnings retention and managerial compensation are positively related, whereas dividend payout ratio is evidenced to be negatively related to managerial compensation. Similar studies by Bhattacharyya and Elston (2011) and Bhattacharyya, Mawani and Morrill (2008a) (2008b), based on Germany, the US and Canada market respectively, also find that there is negative relationship between executive compensations and dividend payout ratios. Therefore, the findings obviously support the idea that dividends have a vital role in agency costs mitigation.

Finally, Peterson (1996) suggests that firms in the market are competing with each other in signalling the firms' information, thus creating noisy signals of dividends. The study is based on constructed experiment for the market environment where the function of dividends is to signal firm's earnings information. The finding shows that the role of dividends in these surroundings is not noticeable. Moreover, not only do the information asymmetries exist among managers and investors, which cannot be reduced by payment of dividends, but the competing environment might impact the information delivered by dividends. In other words, dividend signalling might not be efficient in case the agents (manager for instance) find difficulties to filter out the sources of the signalling noise.

The above reasons suggest that investors might not be able to rely on dividend signalling in a straightforward manner. A study by Goddard, McMillan and Wilson (2006) in

[44] The firms still delay the reduction of dividends even if they experienced poor past as well as anticipated future operating performance.

the UK, suggests that the prices, dividends as well as earnings have diverse relationships among them. Therefore, they suggest that a single hypothesis cannot be established to determine dividends or the signalling role of dividends for firms' earnings and the price of the shares, but the relationship seems to be similar amongst them for many cases. Therefore, both smoothing hypothesis and dividend signalling hypothesis are not applicable to explain the relationship between dividends, earnings and prices.

A few studies on corporate payout policies have highlighted the importance of share repurchases as an alternative form of payout[45]. A share repurchase is an alternative payout to a cash dividend in which firm repurchases shares of its common stock. According to Allen and Michaely (2002), share repurchases were relatively unimportant until the mid-1980s, but since then, have become an important form of payment[46]. Dann (1981) and Vermaelen (1981) both report the price of the stock increases in response to the repurchase, thus suggesting among others, the general explanations for repurchase of stock is when firm managers believe that the stock is undervalued. The later studies by Comment and Jarrell (1991) and Stephen and Weisbach (1998), on the other hand, suggest that firms might announce the share repurchase programmes due to poor performance of the stock market.

Based on the US market, Jaganathan, Stephen, and Weisbach's (2000) highlight that the difference between dividends and share repurchases is mostly focused on the tax advantages of repurchases over dividends. However, taxes should not be considered only to explain the practice involving dividends and repurchase. While dividends are presumed to grow smoothly with the business cycle, aggregate share repurchases, on the other hand, are considered more volatile. During successful periods, for example, firms might increase their repurchases relative to dividends and reduce them in case of recession. The study also proposes that the timing for payment of dividends and repurchases might matter, and also different types of firms might apply it differently. Further analysis shows that the firms with "higher operating" cash flows have a tendency to increase dividends. In contrast, firms with

[45] There were two different views with regards to dividend and share repurchase. Miller and Rock (1985) and Bhattacharya (1979) suggest that there is no distinction between dividends and repurchases (substitute) while other researchers, such as John and Williams (1985), as well as Allen et al. (2000) rely on differential taxation, suggesting that dividends and repurchase policies are different, thus cannot be directly substituted between the two.

[46] Allen and Michaely (2002) state that the Legislation introduced in the Companies Act 1981 "gave UK companies their first opportunity to repurchase their own shares, other than through redeemable preference shares. This had been common practice in the US for some time, but UK companies were, at first, somewhat circumspect. However, the 1990s saw a vast increase in repurchase activity".

"higher non-operating" cash flows might increase their repurchases. The study therefore, concludes that the payment of dividends might be preferred by managers to distribute the firm's permanent cash flows. On the other hand, firms possibly use share repurchases in paying out temporary cash flows.

Brav et al. (2005) suggest that managers are in favour of share repurchases because of the flexibility they offer in both timing of their release in the equity market and in deciding on the amount of the payout in conjunction with investment and financing decisions based on their survey and interview. Three hundred and eighty four (384) financial executives were involved in the survey, including 256 and 128 public firms and private firms, respectively. They also conducted the interview with top executives, including the firm's chief financial and executive officers as well as treasurers. The study basically examined the factors which influence the firms' decision making towards the formulation of dividend policy and share repurchase. The result suggests that there is a need to maintain the level of dividends on par with investment decisions and managers seem to avoid dividend cuts, except for extraordinary situations. Previous discussions highlight the possibility of dividend and repurchase decisions in conveying information to investors. Some of the researches discussed earlier also suggest that dividends might function as a costly credible signal in delivering information on firm value. They even assumed managers believe that that dividend signalling might separate them with their competitors. However, the survey/interview reveals that managers do not actually agree with that assumption. They suggest that the market might be of the view that the motive to cut dividends by managers is probably due to on-going and severe liquidity crises. Initially, it was assumed that the "bad" firms might not cut their dividends in order to provide good impression of firms' performance, although they expect the firms' liquidity crisis to be severe. However, the study suggests that it is possible to separate the "good" firms from 'bad" competitors, by not implementing the dividend cut since the "bad" competitors might not be able to fund the higher cost of dividend payment merely to mimic the "good" firm's policy. The finding also states that the managers agree that the flexibility nature of repurchase in comparison to dividends may allow them to alter payouts (for instance; "in response to the availability of good investment opportunities, to accommodate time-varying attempts to affect earnings per share or stock valuation, to offset stock option dilution"). Besides, the managers suggest that the capability to repurchase to simplify the process of returning capital to investors in an appropriate time, might be the main reason for increase in repurchase activities. Similarly, a study by Oswald and Young

(2008) also supports the idea that the share repurchases is more flexible compared to dividends. This is true when the share repurchases might permit a firm's management to adjust the payouts in case of firms facing unpredictably strong cash performance, and this is impossible with dividends.

Previous research findings seem to conclude that the only flexible way to distribute the surpluses of temporary cash flow is through share repurchases. However, Brennan and Thakor (1990), as well as Barclay and Smith (1988), argue that the advantage of share repurchase is limited and is not applicable for all investors, especially uninformed investors (investors who are not having relevant information). The existence of informed investors in the market might allow them to sell the overvalued stock, and as a result, uninformed investors may lose in case they tender their shares. Therefore, in case where the adverse selection costs due to share repurchase are greater than their tax advantages, uninformed investors might choose dividends over repurchases. The payment of dividends is pro-rate. Therefore, other than their tax disadvantages, the information provided by dividends seems rational. Since adverse selection problem is not an issue to informed investors, thus for tax efficient payout, they possibly favour stock repurchases compared to dividends.

Although some researchers argue that repurchase of shares is an alternative form of payout, but dividends still act as a stronger commitment device (Chiang et al., 2006). Moreover, some might argue on the role of repurchases as substitutes for dividends[47]. It is not an unusual finding since earlier research by Lintner (1956), among others, already suggests that the management of a firm tends to be more committed to maintain a stable dividend policy. Chiang et al. (2006) conducted a study to determine professional investors' perceptions of dividends, using mutual fund managers as a proxy for such investors. The authors summarise the survey with the following concluding remarks:

"What we learned from the current work and the two others that preceded it studying perception by professionals at the opposite sides of the same coin (the firm and the investor) is that:

- Investors like dividends;
- Investors like to see dividends either remain the same or increase over time;

[47] Baker, Chang, Dutta and Saadi (2012) in their survey, find that managers for non-dividend paying firms do not agree with the idea that stock repurchases are substitutes for dividends.

- Investors dislike dividend cuts, whether partial or total;
- Professional decision makers of the firm and investment funds know all that;
- Many professionals, but not all, also believe that dividends are important;
- Paying dividends by firms that are different in size and at different stages of their life cycle may be myopic in one instance, and an economically rational move in another; and
- Dividend patterns do exist; therefore signalling well-being with dividends is just a limited and unclear explanation."

Source: Chiang, K., Frankfurter, G. M., Kosedag, A., & Wood Jr, B. G. (2006). "The perception of dividends by professional investors". *Managerial Finance* , 32(1), 78

Based on the survey findings' concluding remarks, investors seem to prefer dividends for whatsoever reasons. In addition, the study also suggests that the initiation of a dividend might force the firm to continuously pay dividends in the future, because the market would respond directly to any changes in dividend payments[48].

From a different viewpoint, Ross (1977) argues that dividends can be viewed as a costly and credible signal. The point highlighted in Poterba and Summers (1985), as well as Zodrow (1991), is the existence of dividend payments in the countries in which distributions of dividends are actually tax disadvantaged. The scenarios might motivate researchers to find the possible reasons for dividend paying. Based on earlier discussion, some researchers suggest that insiders might have better information compared to outsiders (for instance: firm's investors) about future cash flows of the firm. In line with previous research, Allen and Michaely (2002) also suggest that information about the firm's prospects might be conveyed through dividend payments. Besides, the payment of dividends might deliver information that was not previously known to the market. In case where the payment of dividends is tax disadvantaged, therefore signalling through dividend payment to change market views in relation to future earnings is considered costly.

The tax-based signalling theory is established on the notion that the costs of dividend payments are higher than repurchases. Managers might purposely use dividend payments to disseminate information to the market even though it costs more compared to repurchase activities. If dividend payments are more costly than share repurchase, then why should

[48] Also see, for example, Aharony and Swary (1980), Charest (1978), Kwan (1981) and Woolridge (1983).

managers still choose dividends for signalling purpose? Information delivered by costly signalling through dividends might be perceived by investors as a good interpretation of a firm's future outlook. Looking for stronger market reaction, managers therefore proceed with payment of dividends. This situation was highlighted by John and Williams (1985), in their study. They assume that firm's shareholders might be selling some of the shares to fund their liquidity needs. Consequently, they might have to sell their shares at below the true value in case the firm is undervalued. The managers are actually able to find the true value of the firm, but not outside investors. On the other hand, in case firms pay taxed dividends, it is perceived by outside investors as good signal, thus influencing the rise of share prices. This scenario allows the shareholders to sell equity at lower price than it is supposed to be to meet their liquidity needs and also to retain the level of firm shares.

A study of the US market by Bernheim and Wantz (1995) provide findings that support the dividend signalling hypothesis. They suggest that the market reactions to the increases in dividend are more favourable in periods of higher relative tax on dividends. Basically, the result suggests a stronger positive relationship between the rates of dividend tax and the "share price response per dollar of dividends". Dividend signalling hypothesis therefore is supported by the findings. A few studies[49] also suggest that the useful information of firm's future values might be related to higher tax on dividends. They argue that the higher taxation of dividends might explain the payment of dividends in the US and this is in line with tax-based signalling models that propose the higher tax on dividends is required to make them informative about companies' values[50]. The implication is that dividend news would not be informative without it. However, Amihud (1997) provides interesting results showing that dividends are still informative in the absence of higher tax. Initially, Amihud (1997) argues that dividends should not be informative under such circumstances, before changing his conclusions on the basis of his findings. In Germany, dividends are tax-advantaged and some investor classes are taxed even lower. Therefore, they propose that dividends will not be informative there. Conversely, the results show that the changes of dividends in Germany cause stock-price reactions in the same way that they do in the US. Thus, he suggests that there must be other causes, which make dividends informative.

From a different standpoint, human behaviour and perceptions must be considered when analysing the use of dividends as a signalling tool. Gillet, Lapointe, and Raimbourg

[49] Bhattacharya, 1979; John and Williams, 1985; Bernheim, 1991; and Bernheim and Wantz, 1995

[50] See Bhattacharya (1979), John and Williams (1985), Bernheim (1991), and Bernheim and Wantz (1995).

(2008) suggest that a dividend policy established at firm's level might not be understood without worry of its reputation. This might be true since it is a reflection of people's perceptions towards the firm. They assume that the management's decision to gain a reputation is not temporary, but the commitment should be long-lasting. Since dividend increase will be interpreted as good news, the management of the firm might choose dividend policy to signal the worth of its firms' project. The implication is that, the firm should therefore continue with the same signalling policy afterwards, so as not to lose its reputation.

Another view of dividend policy comes from Dickerson, Gibson, and Tsakalotos (1998), based on their UK study. They basically determined the risk on takeover and dividend strategy. The findings, among others, suggest that a high dividends strategy can be used to avoid the possibility of takeover. As an illustration, they suggest that a firm is supposed to replace the investment of an extra £1 with payment of dividend as that is the effective defence strategy for takeover. This approach might also lower the attractiveness of takeover especially when a bid has been made and the company pays a dividend. Therefore, they suggest that UK firms may possibly use dividends in maintaining shareholder loyalty, where a financial system is characterized by an active market for corporate control.

The mixed findings discussed above question whether dividend payouts are used to signal firm quality, or whether investors actually use other indicators. Since the current study focuses on dividends and institutional investors, such as pension funds, the next section discusses both institutional investors in general and pension funds in particular before proceeding to discuss the relationship between dividends and institutional investors. The following Figure 2.2 summarizes the research findings discuss in this section.

Figure 2.2: Summary for dividend signalling hypothesis:

Authors (year)	Findings
Bhattacharya (1979)	Signal through choice of dividend: The greater the increase in expected future cash flows that managers wish to signal, the higher they will increase their dividend payout.
Pettit (1972)	Dividend changes cause significant price changes.
Aharony and Swary (1980)	Changes in share price are still significantly related to the announcement of dividends, although a firm's current earnings are already known by the market.

Hodgkinson (2002)	1. Acknowledgement of the impact of surplus ACT on dividend surprise is noticeable by investors if the earnings' surprise is positive. 2. The dividends' ability in signalling the information to investors seems to offset the importance of any associated tax costs if the earnings' surprise is negative.
Miller and Rock (1985)	1. Increase in dividends might be interpreted as estimates of higher earnings that are permanent. 2. Reduction in dividends might signal lower earnings in the future.
Stacescu (2006)	Dividends have something to say about earnings: 1. Increases in dividends are related to the positive significant changes in average earnings. 2. Dividend decreases related to average earnings with negative changes.
Healy and Palepu (1988)	Earnings changes and dividend announcement: Initiation of dividends and omission of dividends may act as "managers' forecast" for earnings increase or decrease in the near future.
Kao and Wu (1994)	Dividends convey firm's earnings information for approximately the next two years following the dividend payment.
McManus, ap Gwilym and Thomas (2004)	Payout ratio conveys signalling information, and it is greater than that of the dividend yield.
Handjinicolaou and Kalay (1984)	Hypothesis on information content Vs hypothesis on wealth redistribution (bond price behaviour): Dividend increase might not impact the prices of the bond, but respond negatively to the reduction of dividends.
Dhillon and Johnson (1994)	Large increase in dividends contributes to positive reaction in the stock market but a negative reaction of the prices in the bond market.
Farinha and Moreira (2009)	Firms' earnings quality can be signalled by firms' dividends.
Benartzi, Michaely, and Thaler (1997)	Firms' future earnings forecasts might not credibly be signalled by changes in dividends.
Tse (2005)	No requirement for large firm to use dividends as signalling tool since investors normally have confidence in large firm's announcements as well as its forecasting.
Allen and Michaely (2004)	Dividend payouts higher in large and mature firms with available free cash flow as well as limited growth opportunities.
Fama and French (2001) and De Angelo et al. (2004)	Large, profitable firms pay more dividends than those with more investment opportunities.

Chang, Dutta and Saadi (2012)	Managers perceive growth opportunities, low profitability and cash constraints might influence firm's not to pay dividends.
DeAngelo and DeAngelo (1990)	Firm cuts dividends for the period of financial distress.
Ofek (1993)	The finding shows that the firms with high leverage have more tendencies to react to short-term distress compared to the firms with low leverage firms with high leverage tend to respond financially, through dividend cuts, and they do this to avoid lengthy periods of losses.
D'Mello and Mukherjee (2001)	Poorly performing financially-distressed firms do not immediately reduce their dividends but delay it to allow for transferring of wealth from bondholders to shareholders.
Bhattacharyya (2007)	1. Ratio of earnings retention positively related to managerial compensation. 2. Dividend payout ratio negatively related to managerial compensation.
Peterson (1996)	Dividend signalling might not be efficient due to signalling noise.
Goddard, McMillan and Wilson (2006)	Single hypothesis cannot be established to determine dividends.
Jaganathan, Stephen, and Weisbach's (2000)	1. Dividends preferred by managers to distribute the firm's permanent cash flows. 2. Share repurchases to pay temporary cash flows.
Brav et al. (2005)	Managers are in favour of share repurchases because of the flexibility they offer (timing and amount).
Oswald and Young (2008)	Share repurchases is more flexible compared to dividends.
Brennan and Thakor (1990), as well as Barclay and Smith (1988)	Advantage of share repurchase is limited and is not applicable for all investors, especially uninformed investors.
Chiang et al. (2006)	Dividends still act as a stronger commitment device.
Ross (1977)	Dividends can be viewed as a costly and credible signal.
John and Williams (1985)	Costly credible signal: If firms pay taxed dividends, it is perceived by outside investors as good signal, thus influencing the rise of share prices.
Bernheim and Wantz (1995)	The market reactions to the increases in dividend are more favourable in periods of higher relative tax on dividends.
Amihud (1997)	Dividends are still informative in the absence of higher tax.
Gillet, Lapointe, and Raimbourg (2008)	Dividend policy established at firm's level might not be understood without worry of its reputation.
Dickerson, Gibson,	High dividends strategy can be used to avoid the possibility of

and Tsakalotos (1998)	takeover.

2.4 Institutional Investors

Interesting features of institutional investors were highlighted by Hand (1990). According to Hand, they are generally expected to be sophisticated investors. He defines "sophisticated investors" as traders with capability to interpret the information that is available in a correct manner. Additionally, Berenbeini (I994) suggests that institutional investors have a tendency to access the information from firms. But, the question is why in the first place, institutional investors are willing to search for that information? Wilson (1975), in his study, argued that institutional investors engage in information search activity because of the incentives due to increasing returns-to-scale in producing the information; information cost per unit of scale declines as the scale increases, while the value of information per unit does not change. Thus, compared to individual investors, institutions find production and analysis of information to be more beneficial.

Basically, institutional investors are fiduciaries who invest on behalf of others. It is possible for them to speculate other people's money and therefore require the laws to control them. Pension funds in the UK, for example, are governed by the Pensions Act 1995, under which among other responsibilities, all pension funds are required to provide a statement of investment principles (SIP). The purposes of the SIP are to give details to the members of the fund, and employers and others on the management of the fund's asset. The Hampel Report 1998 states that the institutions including pension funds, insurance companies, unit and investment trusts are holding 60 percent of listed UK firms' shares. Twenty percent of the remaining forty percent is held by individuals, while the balance is owned by overseas investors, mainly institutions. A study by ONS[51] (2004) also provides evidence that institutions in the UK market make up an important segment of investors. The conclusion is based on the fact that the financial institutions, mainly insurance companies (17.2%), pension funds (15.7%) and overseas institutional investors (32.6%) hold about 80 percent of UK

[51] Office for National Statistic (ONS) is "the UK's largest independent producer of official statistics and the recognised national statistical institute of the UK. ONS works with its customers, large and small, to fully understand their needs and keep pace with changing demands".

equity. According to the Myners Report[52] (2001), pension funds specifically, are reported as the main investors in the UK financial markets since they own twenty percent of UK's corporate equity. Since the current study focuses particularly on pension funds in the UK market, the following subsection discusses its nature and background, as well as investment practices.

2.4.1 The Nature of Pension Funds

According to the Controller of HMSO[53] (2003), pension funds in the UK are mostly organised as trusts which are "legal entities that place the responsibility for taking care of certain assets in the hands of third parties, governed by trust deeds, general trust law[54] and specific pension legislation, in particular, the Pensions Scheme Act 1993 and the Pensions Act 1995". In particular, The Pension Law Reform Committee (PLRC) (1993: S13B) states that there is a need for trustees of the UK pension funds to act as "prudent persons". The PLRC for example, suggests that they must exercise "the care and diligence that a prudent person of business would exercise in managing the affairs of others" and "conduct the business of the trust with the same care as an ordinary man of business". In other words, the responsibility of trustees for instance, to be caring in exercising the duties is reflective of the "prudent person rule". The report also suggests that the need for trustees to act as "prudent persons" is not the substitute standard applicable for professional managers but only refers to "non-professional" trustees.

Later, the role of trustees was well-defined by the Trustees Act 2000, in which the Act, among others, requires trustees to have a strategy for fund investment. In addition, they have to either seek professional advisors for investment purposes, or otherwise, the duties should be delegated to suitable agents. The Trustees Act 2000 places a particular duty of care on pension fund trustees and requires them to operate under the prudent-man principle, similar to that adopted a quarter of a century earlier by the 1974 ERISA[55] in the US. In particular, the effect of the 1995 Pensions Act was to align the statutory investment powers of trustees with the powers under trust law. Pension funds are free to invest in virtually any type

[52] The Myners Report is looking at "institutional investment in the UK and established a best practice approach to investment decision making for pension funds".

[53] Her Majesty's Stationery Office (HMSO).

[54] For example: "Trusts of Land and Appointment of Trustees Act 1996; Trustee Delegation Act 1999; Trustee Act 2000".

[55] The Employee Retirement Income Security Act of 1974 (ERISA) "is a federal law that sets minimum standards for most voluntarily established pension and health plans in private industry to provide protection for individuals in these plans".

of asset, financial or real, cash or derivative, at home or abroad. They can invest in anything and use a whole range of risk management techniques to hedge their portfolios.

The 1995 Pensions Act announced a structure of regulations that has been referred to as the Occupational Pensions Regulatory Authority (OPRA). Due to the establishment of OPRA, trustees began to be regulated under OPRA and their responsibilities were codified for the first time[56]. Based on OPRA, they are also required to provide a SIP in relation to the assets of the funds. The basis of SIP is that the trustees act to maximise the returns on their investments, subject to matching assets to liabilities. Other considerations have been introduced since July 2000. The SIP must indicate the extent (if at all) to which social, environmental and ethical aspects influence their investments.

The 1995 Pensions Act gives trustees the overall responsibility for the investment policy of the pension funds through the SIP. However, there is no specific obligation for the trustees to adopt a corporate investment policy. That is clearly stated by PLRC (1993) in which "trustees are not required to have investment or financial experience but rather, through obligation and under common law, are required to act in good faith, exercise their discretion and promote the best interests of their beneficiaries". Nevertheless, trustees are still limited by the extent to which they can place restrictions on the fund managers they appoint to invest the fund's assets. Scott (2002) suggests that trustees come from different levels of society[57]. Therefore, monitoring of public funds might not be their area of expertise. Therefore, the capability of those trustees to monitor the funds for occupational pension funds might be questionable. Even if pension funds trustees are capable enough in the related areas/positions, but they might not perform if they are not familiar with public pensions management and lack knowledge on the specific details in running a pension fund.

Bodie and Davis (2000) state that the role of pension funds, among others, is to collect funds from sponsors/beneficiaries, to pool the funds and lastly to invest the funds in providing beneficiaries future pension entitlements. There are two types of pension plans, i.e. defined contribution funds and defined benefit funds, dependent on the market and guaranteed rate of returns respectively. Defined benefit (final salary) is the scheme in which the employer provides a guaranteed pension, and is commonly defined as some proportion of

[56] Under the regulation, trustees are supposed to sign up professional advisors as well as to prepare some reports including annual reports and accounts.

[57] Pension fund trustees might be government officers, teachers, administrators, librarians, trade union members and shop floor supervisors.

the final year's earnings. The scheme also depends on employee's number of working years. Defined contribution (money purchase) is the scheme that always finances and transforms the pension funds value at retirement into an annuity[58]. The defined benefit and defined contribution funds are basically managed by trustees. The trustees are usually nominated by the employer for both types of the scheme, and they are supposed to follow advice from the actuaries[59]. Bodie and Davis (2000) also highlight that pension funds nowadays have a risk of increasing liabilities, for instance, increase in wages as well as the risk of holding the assets, and therefore contributing to volatility of returns. Therefore, the advice from the experts for pension funds investment is required for better future of pension beneficiaries.

Some of the studies suggest a few characteristics of pension funds that shape investment practice. Davis (2000) suggests that the pension funds maturity might influence the portfolio distribution of an individual pension fund. The maturity of pension investment defined in the study is "the ratio of active to retired members". The extent of liabilities[60] for immature funds (small size of pension repayment) is considerably longer than mature funds (large size of pension repayments). Other than that, the duration of liabilities might even be shorter in case a fund is closing down/winding-up. Based on the duration of liabilities which varies among firms, Blake (1994) proposes three rational investment practices to be applied by the funds: (1) Immature funds facing real liabilities are supposed to mainly invest in equities in which cash flows have a long duration; (2) Mature funds are supposed to invest in both equities and bonds (combination of investment); and (3) Funds which are winding-up are supposed to mainly invest in bonds in which cash flows have a short duration. However, understanding of pension fund investment will be complicated as once reported by Davis (2000). He states that pension funds sometimes proceed to invest according to non-financial objectives due to certain pressures, for example, from local infrastructure projects.

According to Ian (2002), the large pension funds trustees usually delegate their duties to fund managers in dealing/managing the pension funds' portfolio. Fund managers can be "in-house", employed by the funds, or external fund management houses. In order to monitor their performance, pension funds and fund managers are often evaluated according to a

[58] See Ian (2002).

[59] "Pension actuaries work with other specialists, such as pension's lawyers and administrators, to help different pension schemes meet the needs of trustees, employers and scheme members. As schemes will be affected by the investment market, and changing legislation and regulation, an actuary is on hand to provide specialist advice" (Source from: http://www.actuaries.org.uk/practice-areas/pages/pensions extracted on 12/03/2013).

[60] The duration of liabilities is defined as "average time to discounted pension payment requirement".

benchmark. According to Blake and Timmermann (2002), benchmarks that have been practiced in the UK can be divided into two types, "external asset-class" and "peer-group"[61]. Benchmark of "peer-group" is popular among pension funds and mutual funds. However, the use of customised benchmark show that the particular purposes set by specific funds is increasing in the UK. Benchmark provides guidance for the selection of assets' type and it also assist pension funds to avoid investment in some other asset's type. Blake and Timmerman however, suggest that the relative performance of pension funds against its peer-group is much more useful for the success of fund management houses in the long-run. As early as the 1970s, the performance benchmarks were already being practiced in the UK. Benchmark is perceived as an important part of the investment strategy for institutional investors. It may help fund managers to describe the trustee's expectations as well as help them to set the targets for the funds. For illustration, benchmarks might be set based on liabilities, and therefore might also change due to changes in liabilities, for example as a result of increasing maturity.

Blake and Timmerman (2002) listed the factors that might influence the benchmarks. Firstly, benchmark might be influenced by regulations, for instance the "Minimum Funding Requirement" (MFR) should be maintained by the fund. Secondly, it might be influenced by the requirement of the accounting standards, specifically designed for pension funds, for example, the "Financial Reporting Standard 17" (FRS17[62]). Finally, the trustee preferences, for example, the preference to minimise the employer contributions' volatility into a pension plan rather than minimise the average level of contributions by employer, given that, in final salary plans, the pension is funded on a balance-of-cost basis. Benchmark is important as the appropriate benchmark might monitor the fund manager. Blake and Timmerman suggest that conflict exists with relation to the benchmark in which the fund's performance might be referred to for investment decision, compared to a risk decision. But, an appropriate benchmark actually recognizes the strategic asset allocation (SAA[63]) that is a risk decision relative to the liabilities, and not expected return decision. SAA might not be interpreted as

[61] The US also uses similar benchmarks of "external asset-class" and "peer-group".

[62] FRS 17 is a Financial Reporting Standard 17 'Retirement Benefits". The Accounting Standards Board issued FRS 17 in November 2000 provide guidance for mandatory disclosure requirements for accounting periods ending on or after 22 June 2003. The purpose of the FRS 17 is to provide financial statement users with "adequate disclosure of the cost of providing retirement benefits and related gains, losses, assets and liabilities" (FRS 17, paragraph 1c). Hope (2003) suggested that the standard might potentially enhance the transparency of a company's economic obligations and improve analysts' ability in predicting future earnings and cash flow.

[63] Portfolio in long-term should be a division of major categories of investment assets for instance; equities, bonds and property.

investment decision, but it is determined mainly on maturity structure of the anticipated liability cash flows. On the other hand, selection of stock and market timing decisions are actually investment decisions, and by right, the fund manager's performance should be judged against the benchmark provided by the SAA.

Blake, Lehmann and Timmerman (1999) conducted a study which ran a systematic investigation for managed portfolios' performance across several classes of assets based on 300 or more asset holdings of pension funds in the UK. They suggest that the trustees of UK pension funds have a tendency to place a considerably high value for the service given by the fund manager. The findings also highlight that the good services as well as good personal relationships exist among fund managers and trustees might pay-off for the periods in which performance of investment is considered poor, and fund managers therefore might retain investment mandates. They also provide an illustration on the significant features of the UK experiment as follows:

1. "UK pension funds managers have a weak incentive to add value and are largely unconstrained in the way in which they attempt to do so. While the strategic asset allocation may be set by the trustees in principle, any resulting limits are so flexible as to be effectively enforced because of wide tolerance in allowable deviations of short-run from long-run assets allocations and because the strategic asset allocation itself can be renegotiated in most cases".
2. "Fund managers know that their relative performance against their peer group, rather than their absolute performance, determines their long-term survival in the industry".
3. "Over the course of mandate, most UK pension funds managers earn fees related solely to the value of assets under management and not their relative performance against either a predetermined benchmark or their peer group (i.e. there is no penalty for under-performing and no specific reward for outperforming and agreed upon benchmark)".
4. "The heavy concentration in the UK industry is likely to lead to portfolios being dominated by a small number of "house positions" in respect of asset allocations, with each fund management house's preferred position being similar to the others to reduce the risk of relative underperformance".

Source: David Blake, Bruce N. Lehmann, Allan Timmerman. Asset allocation dynamics and pension fund performance, Journal of Business, 1999, vol. 72, no.4.

Based on the above features, the UK pension fund managers may not be pressured to maintain the performance of pension funds' investment. On top of that, the UK pension funds managers not to worry over imprudent investment behaviour during the period since no substantive regulatory controls on litigation (Blake et al., 1999).

In the same vein, a recent review[64] by Professor Kay (2012)[65], specifically discussed the important role of pension funds in enhancing corporate governance, including emphasising the role of pension fund managers (i.e. asset managers[66]). The Kay Review calls on pension funds to take more responsibility in their role as shareholders; and managers to arrange more direct relationships with savers[67]. The Review requires asset managers to hold more focused portfolios and move away from investment vehicles which are currently short-term focused. Cox, Brammer and Millington (2007) argues that it is competition between fund managers for managing pension fund portfolios which shifts their focus to short-term objectives and that financial performance tends to be the dominant measurement for measuring pension fund performance. Kay (2012) also argues that there are currently incentives to intermediaries to focus on short-term gain and adds that this can damage both companies and the returns of pension funds.

Kay adds that the current regulations governing pension funds impose frequent reporting[68] requirements which will also promote short-term performance monitoring. Kay suggests that asset manager should focus more on long term thinking to ensure better returns for savers, pension funds and their sponsoring companies. Cox et al. (2007) suggests that pension funds may be more likely to adopt a long term perspective if relatively few fund managers are engaged to manage a pension fund's portfolio to reduce competition focussed on short-term performance. They also add "A particular concern is the absence of any incentive for companies to take actions that mitigate their social and environmental impacts" (p.1323). Kay also proposes that pension funds should introduce measures which would shorten the investment chain and better align interests across the chain to the long-term

[64] Professor Kay, The Kay Review of UK equity markets and long-term decision making, July 2012.

[65] In June 2011, the Secretary of State for Business, Innovation and Skills asked Professor Kay to review activity in UK equity markets and its impact on the long-term performance and governance of UK quoted companies. The final report published in July 2012.

[66] The Kay Review (2012) states that two intermediaries that importance for pension funds' investments are the assets managers and asset holders. Assets managers is the one who makes buy and sell decisions whereas the term assets holder refers to agents (i.e. pension funds trustees and insurance companies) which have delegated the responsibility for asset management; who may hold legal title to the shares but do so as agents for savers who enjoy the economic interest.

[67] The term saver or beneficiary describes the person whose money it is.

[68] Kay Review recommends that the Mandatory IMS (quarterly reporting) obligations should be removed.

interests of pensioners. The Review also recommends that more people in the investment chain should apply "fiduciary" standards; and should have a responsibility to put their clients' interest first.

Basically, the Kay Review highlights the changing role of pension funds in the UK equity market. Individuals and brokers used to play a key role in the market before 1990s. However, insurance companies and pension funds holding around half of the total after 1990s[69] (Table 2.1). These changes have resulted in the employment of professional asset managers as the key investment who buy and sell on behalf of others. As discussed above, assessing their performance using short-term measures switches their focus to the short-term rather than the long-term whereas pension fund recipients focus is on the long term. They have also taken over the tasks attributed to being a shareholder such as voting.

Table 2.1: Historical trends in beneficial ownership (percentage held)

	1963	1975	1981	1991	2001	2008	2010
Rest of the world	7	5.6	3.6	12.8	35.7	41.5	41.2
Insurance companies	10	15.9	20.5	20.8	20	13.4	8.6
Pension funds	6.4	16.8	26.7	31.3	16.1	12.8	5.1
Individuals	54	37.5	28.2	19.9	14.8	10.2	11.5
Other	22.6	24.2	21	15.2	13.4	22.1	33.6

Source: ONS (as cited in Kay Review, 2012)
Note:
i) ONS data for 2010 is not directly comparable with that of previous years due to a change in methodology.
ii) Whilst the "rest of the world" category represents a large proportion of the population, there is no identification of those holders who have traditionally been UK based but taken over by foreign competitors, yet remain based in the UK. For example, Blackrock's takeover of BGI would reclassify this assets manager as a foreign owner.

According to the Review, the asset managers are mostly, hired by:

i. other intermediaries (i.e.) asset holders such as pension funds trustees and insurance companies;
ii. other asset managers; or
iii. on the recommendation of investment consultants; or
iv. independent financial advisers

[69] "Both life insurance companies and pension funds traditionally placed funds principally in fixed interest securities, both government and corporate, and secondarily in property. From the 1960s, these institutions substantially increased their equity exposure. At the same time, the coverage of occupational pension schemes among UK employees was greatly extended. By the 1990s, UK insurance companies and pension funds were the most important holders of UK Equities, accounting for around half of the total."

Asset managers will generally provide monthly performance information to be reviewed by asset holders and will typically discuss that performance on a quarterly basis. The effectiveness of the system is arguable since past performance is not necessarily a guide for future performance. On another perspective, in line with what have been reported earlier by Blake et al. (1999), the Review also highlights that the performance of asset managers is currently measured on their performance relative to index benchmarks, or their performance relative to other asset managers in defined category (relative performance). The conflict of interest exists because pension funds savers are looking for absolute performance, which is the total return generated by a fund or portfolio, and not a relative performance. The outcome from the current system also encourages competition among asset managers to outperform each other. However, the actions cannot increase the value of firms; to enhance long-term value of investment.

A few analysts have suggested that the accumulations of money owned by everyone through various types of public employee pension funds, union pension funds, mutual funds, and other forms of "institutional investors" might even come to have a significant role in shaping corporate behaviour (Domhoff, 2013). Peter Drucker (1976, 1993) comes with the idea that pension funds could be used to control corporations (pension funds socialism) and his view led to the possibility of pension funds to participate actively in corporate governance. Clark (2000) suggests that the idea of "pension fund socialism" is an exercise in political rhetoric rather than reality. Employees who contribute to pension funds have a legal right to their pensions but hardly have any rights to vote for any stock purchased by the pension fund. On the other hand, the pension fund trustees who have no legal ownership of any stock they purchase; have a fiduciary responsibility to invest the money. Establishing "good" corporate governance is not likely to be viewed as part of their fiduciary duty, hence there is no requirement for them to exert any influence on corporate boards.

The only way shareholders can protect and enhance the value of their ownership interest is by being proactive, informed, and diligent. Domhoff (2013) argues that public pension funds have a potential to actively involve with corporate governance[70]. As fiduciaries are responsible for other people's money, there is a particular obligation of pension fund trustees and asset managers to protect and enhance the value of the ownership interest;

[70] Partners at the Wall Street investment firm of Kohlberg, Kravis, Roberts convinced the director of the pension fund in the state of Oregon to contribute major sums to their takeover projects.

however, there are consequences of the way intermediaries behave. The New York Times (Anderson, 2010) has conducted an analysis which shows that pension funds pay a lot of money to managers i.e. $17 billion in fees in which the charge fees includes 2% of the money they manage; and 20% of the profits they generate. Some of the public funds are able to achieve high returns but problems occur when many public pension funds are struggling to recover from a collapse in the value of their portfolios.

This section describes the nature of pension funds including the important role of pension funds; pension funds investment practice; and the challenges facing by pension funds. The next section discusses the role of dividends in potentially attracting institutional investors, such as pension funds. The following Figure 2.3 summarizes the findings:

Figure 2.3: Summary for institutional investor research findings:

Authors (year)	Findings
Hand (1990)	Institutional investors generally expected to be sophisticated investors (capability to interpret the information that is available in a correct manner).
Berenbeini (I994)	Institutional investors have a tendency to access the information from firms.
Wilson (1975)	Compared to individual investors, institutions find production and analysis of information to be more beneficial.
The Pension Law Reform Committee (PLRC) (1993:S13B)	There is a need for trustees of the UK pension funds to act as "prudent persons".
Davis (2000)	Pension funds maturity (the ratio of active to retired members) might influence the portfolio distribution of an individual pension fund. The extent of liabilities for immature funds is considerably longer than mature funds. Sometimes investment according to non-financial objectives due to certain pressures, for example, from local infrastructure projects.

Blake (1994)	Investment practices to be applied by the funds: (1) Immature funds facing real liabilities are supposed to mainly invest in equities in which cash flows have a long duration; (2) Mature funds are supposed to invest in both equities and bonds (combination of investment); and (3) Funds which are winding-up are supposed to mainly invest in bonds in which cash flows have a short duration.
Blake and Timmermann (2002)	Benchmarks have been practiced in the UK. UK pension funds have a tendency to place a considerably high value for the service given by the fund manager. The good services as well as good personal relationships exist among fund managers and trustees might pay-off for the periods in which performance of investment is considered poor, and fund managers therefore might retain.
The Kay Review (2012)	Encourage pension funds to take more responsibility in their role as shareholders. Requires assets managers to run more focused portfolios and move away from investment vehicles which are currently short-term focused.
Peter Drucker (1976, 1993)	Pension funds could be used to control corporations (pension funds socialism) and his view led to the possibility of pension funds to participate actively in corporate governance.

2.4.2 Dividends and Institutional Investors

The discussions in sections 2.2 and 2.3 reviewed the general functions of dividends from different perspectives. This section limits the discussion to the role of institutional investors, such as pension funds. As discussed earlier, Baker and Wurgler (2004), among others, suggest that payments of dividends might only be made to realise investors' demand. In the same way, Allen et al. (2000) argue that, among others, the motive for initiation of dividends is to attract institutional investors. They suggest two reasons why institutional investors prefer dividends. Firstly, they argue that institutions are less likely to be sued by investors if their portfolios consist of firms that pay higher dividends. It happens when the court concludes that the firms are practicing prudent investment. Secondly, institutions may not be taxed heavily on dividends, and due to relative tax advantage, dividends may attract more institutional investors. For illustration, assume that firms are the first entity to commit to payout policy. Institutional investors who observe this action then decide its investment

policy (a clientele effect). If institutions favour dividends based on the general institutional charter, "prudent person" restriction rule, and the comparative tax advantages, as a result, higher dividends might contribute to higher institutional holdings.

In the UK, prior to the tax changes in 1997, it was the period when the tax credits were still applicable to tax-exempt investors. Bond et al. (1995) suggest that the tax-exempt investors, including pension funds, are the most influential investors in many UK firms, and therefore, their tax preference for dividend income may result in significantly higher dividend payout compared to firms with an absence of this tax bias. In short, the advantage of dividends for tax-exempt investors may have created a demand for dividends.

A later UK study highlighted the preference for dividends by specific class of investors before the changes to the Financial Act, 1997. Before the tax changes took place, Bell and Jenkinson (2002) suggest that tax-exempt investors, including pension funds, were not liable to pay income tax or capital gains tax. Accordingly, they were allowed reimbursement of the imputation credit (20%). After July 1997, the attractiveness of dividends was reduced as the government removed this tax advantage. Their study examined the dividend valuation for the period before and after the tax change[71] using the ex-dividend-day behaviour of share prices. The study states that pension funds, if not the marginal investor, would anticipate no change in valuation. The argument underlying the study is that the reduction in price on the ex-dividend day might reveal the value of the dividends in relation to capital gains for the marginal investor. The study assumes that in cases where investors were not indifferent between dividends and capital gains, the prices might therefore drop "one-for-one" with the dividends. Most dividend behaviour theories expect the elimination of tax discrimination in favour of dividends reducing the drop-off ratio. Due to the tax changes, the study allows for testing the clientele effect by comparing the estimated drop-off for each yield quintile before and after July 2, 1997. The findings from Bell and Jenkinson's study provide strong support for the existence of clientele effects. Before the Financial Act 1997, the drop-off increased on average to observed dividend yield and this is consistent with the theoretical predictions. However, reductions in the drop-off after the Financial Act 1997 were largest and most significant for high-yielding firms. The study concludes that pension funds are effective marginal investors, for some firms and taxation therefore considerably affects the dividend income valuation.

[71] The changes became effective on July 2, 1997.

A study by Hodgkinson, Holland and Jackson (2006) also examined the market valuation of dividends and the tendency of investors to capture those dividends, during which time, the availability of dividend tax credit repayment to UK pension funds and UK insurance company tax exempt pension businesses was changed. The study uses data on dividend events in which ex-dividend date was for the period 1 January 1996 to 31 December 1999 for UK resident companies and the Republic of Ireland resident companies listed on the Dublin and London Stock Exchanges. The Irish data suggests that UK pension funds and UK insurance company tax exempt investors were the marginal investors in the Republic of Ireland resident companies around ex-dividend days where there was the entitlement to re-claim a dividend tax credit. However, there is little evidence that UK pension funds and UK insurance companies are tax exempt in the Republic of Ireland resident companies during any other period. The data in respect of UK resident related companies confirms the results of Bell and Jenkinson (2002), that the marginal investors were UK pension funds and UK insurance company tax exempt investors, and that the drop-off-ratio (DOR) dropped significantly following the removal of the tax credit upon UK resident related companies' dividends.

However, regardless of their tax attractiveness, it can be argued that institutional investors may still prefer firms that pay dividends. As discussed in the previous chapter, O'Brien and Bushan (1991) propose two reasons to explain the need for information by institutions: (1) as a basis for investment purposes; and (2) to satisfy the standards of fiduciary responsibility. In brief, if its beneficiaries take legal action for poor investment performance, the trustees might refer to some information to reflect their prudent investment. According to O'Brien and Bushan, fiduciaries are held to a "prudent person" standard in which they must use the care and judgment that a person of ordinary prudence and intelligence would exercise in dealing with his or her own property, under the circumstances existing at the time. Generally, fiduciaries have cited the use of analyst reports as evidence of their care and prudence. Interestingly, Del Guercio (1996) provides evidence that suggests that the stability of the dividend is one of the institutional investor's prudent investment indicators. His US study determines the role of dividends for portfolio selection. He finds that banks' portfolio choice might not be explained by dividend yield. On the other hand, it is in fact a negative indicator in portfolio choice for mutual funds. Therefore, the study proposes that dividends might not be a major factor towards portfolio choice. However, it suggests that the prudent-man rule has an important role. Since the stability of the dividends is among

prudent investment indicators, therefore, it might also be considered as an important factor in the institutional investor's portfolio selection. Recent study by Leary and Michaely (2011) provides evidence that suggest firms with greater institutional holdings smooth dividend more compared to other firms[72].

From another perspective, Short et al. (2002) explain that shareholders of institutions need funds on an on-going basis. They argue that institutions invest in equities with the intention to provide returns to fund their activities, for instance: paying pensions, paying out on insurance policies, and many others. Therefore, they suggest, the requirements by institutions for certain levels of dividends in funding their own liabilities possibly force firms to pay higher dividends at a level higher than they would otherwise have chosen, specifically during recession period and low corporate profitability. Over and above this, they draw attention to institutional investors' need for dividends, due to the fact that the actuarial value of UK pension funds is in part based on dividend income. In a similar vein, a study by Hotchkiss and Lawrence (2003) suggests that dividends are part of institutions' investment style and find that, as dividends increase, a higher proportion of the stocks are held by those institutions whose portfolios consist of high yield firms.

Focusing on the US market, a study by Grinstein and Michaely (2005) finds evidence that institutions prefer dividend-paying firms to non-dividend paying firms. However, they find that institutions do not necessarily require the dividend payout to be high and provide evidence that some institutions actually prefer low-dividend to high-dividend stocks. The findings provide clear evidence that suggest institutions prefer dividend-paying firms, even after holding risk, market to book ratio, and a host of other variables, constant. However, further tests suggest that institutions do not show any preference for firms that pay high dividends, regardless of size or market to book ratio. They also argue that, despite a potentially larger tax advantage and prudent-man restrictions, pension funds and bank trusts do not show a preference for high dividends and, therefore, they find no evidence to support the notion that a higher dividend leads to higher ownership by institutions, as some theories suggest. In particular, their results do not support the argument of Allen et al. (2000) that higher dividends attract institutions. The study does show, however, that institutional ownership is higher for repurchasing firms than for non-repurchasing firms and, unlike their evidence for dividends, they find a positive relationship between the extent of repurchasing

[72] The study is based on US Market for period 1985-2005.

and the level of institutional ownership. Their evidence indicates that when firms change their repurchasing policy, institutional holdings tend to change in the same direction. However, the overall results do not support the notion that institutions pressurise management to increase payouts, either through repurchasing or through dividends, and neither do they support the idea that an increase in institutional holdings will result in an increase in the level of repurchases. On the other hand, they find strong evidence that institutional investors increase their holdings in firms that repurchase more and in firms that increase their repurchasing activity.

The following might help to explain Grinstein and Michaely's (2005) results. General agency theories, such as that of Jensen (1986), imply that firms with a larger degree of institutional ownership, will then pay more cash, either as repurchases or as dividends, especially if they are more likely to suffer from agency problems. However, adverse selection problems might lead uninformed investors to prefer dividends to repurchases (Barclay and Smith, 1988; Brennan and Thakor, 1990). In the case of the US market, large informed shareholders do not face the same problem, and prefer share repurchases, the least costly payout for them. Since the institutions are likely to be informed, the theory implies that they prefer firms that pay out in the form of share repurchases rather than dividends. Therefore, according to Brennan and Thakor (1990), institutions will encourage management to increase their repurchasing policy.

A similar study of the Australian market, by Jun, Gallagher and Partington (2010), also shows that institutional funds prefer stocks that pay dividends and that, among dividend-paying stocks, there is no simple preference for high-dividend yields. They examined whether dividends affect Australian institutional portfolio holdings, using a sample of institutional equity funds. They used primary data drawn from the Portfolio Analytics Database, consisting of the monthly portfolio holdings (representative sample) of Australian institutional equity for the calendar years 2000 and 2001. Their results showed that institutions are overweight in dividend-paying stocks, but this is driven by the excess weight in stocks paying fully-franked[73] dividends. Both pension funds and unit trusts are overweight in stocks paying fully-franked dividends and are underweight in stocks paying unfranked dividends. The study suggests that the "tax advantage hypothesis" better explains funds'

[73] Under the imputation system, franked dividends, which are dividends paid from profits subject to Australian company tax, carry imputation tax credits. The tax credits, generally called franking credits, represent a full refund of corporate tax. The Australian recipients of franked dividends are able to reduce their income tax liability on the dividends by the amount of the imputation tax credits.

dividend choices[74] compared to the prudent-man hypothesis, as funds have a higher ownership of stocks which carry full imputation tax credits, than stocks which have partial, or zero, imputation tax credits.

Jain (2007) examines differences in the preferences of higher taxed individual investors and lower-taxed institutional investors for dividends and share repurchases using US data for the 1989–1996 period. He finds that institutional investors have a preference for low dividend yield stocks relative to high dividend yield stocks whereas non-institutional and non-insider, "individual" investors have a preference for high dividend yield stocks relative to low dividend yield stocks. He also suggests that individuals prefer dividend-paying firms whereas institutions prefer non-dividend-paying firms. He also stated that relative to individual investors, institutional investors generally prefer firms that engage in larger share repurchases.

Chen and Cheng (2006) conducted a study in a different way, to investigate the reason why institutional investments outperform the market[75]. They determined whether the performance is partially derived from the practice of using the analyst stock recommendations. Their findings showed that the quarterly change in institutional ownership is positively correlated with consensus recommendations and after controlling for other factors. The quarterly change in institutional ownership is on average 0.90 per cent higher for firms with favourable recommendations than for those with unfavourable recommendations. They also includes, among others, dividend yield as one of the control variables. The results for control variables suggest that investors increase holdings of firms with higher dividend yield, higher returns and higher growth[76].

Previous discussion focused on institutional investors in general and pension funds in particular, in relation to dividends. The next section provides an overview of UK dividends and taxes before and after the 1997 tax changes. The following Figure 2.4 summarizes the research findings discuss in this section.

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[74] Under the Australian imputation tax system, unfranked dividends are tax-disadvantaged, while franked dividends are clearly tax-advantaged for pension funds, and possibly tax-advantaged for unit trusts. Evidence that funds are attracted to franked dividends and avoid unfranked dividends is clear support for the tax hypothesis. In contrast, the prudent-man hypothesis predicts a preference for dividends that is independent of franking status.

[75] Prior studies document that institutional investors outperform the market.

[76] The results for control variables are consistent with prior studies. Institutional investors increase holdings of firms with lower return volatility, higher dividend yield, higher returns, more earnings momentum, stronger prior institutional demand, lower EP, lower BP, or higher growth.

Figure 2.4: Summary for dividend and institutional investor research findings:

Authors (year)	Findings
Allen et al. (2000)	Payment of dividends is to attract institutional investors. Why institutional investors prefer dividends? 1. Less likely to be sued by investors if their portfolios consist of firms that pay higher dividends. 2. Institutions may not be taxed heavily on dividend - attract more institutional investors.
Bond et al. (1995)	Tax preference for dividend income may result in significantly higher dividend payout compared to firms with an absence of this tax bias.
Bell and Jenkinson (2002)	Pension funds are effective marginal investors, for some firms and taxation therefore considerably affects the dividend income valuation.
Hodgkinson, Holland and Jackson (2006)	Drop-off-ratio (DOR) dropped significantly following the removal of the tax credit upon UK resident related companies' dividends.
Del Guercio (1996)	Stability of the dividend is one of the institutional investor's prudent investment indicators.
Short et al. (2002)	Institutions need funds on an on-going basis.
Grinstein and Michaely (2005)	1. Institutions prefer dividend-paying firms to non-dividend paying firms. 2. Institutions do not necessarily require the dividend payout to be high and provide. 3. Some institutions prefer low-dividend to high-dividend stocks. 4. Find no support that institutions pressurise management to increase payouts.
Jun, Gallagher and Partington (2010)	Institutional funds prefer stocks that pay dividends and that, among dividend-paying stocks, there is no simple preference for high-dividend yields.
Chen and Cheng (2006)	Institutional investors increase holdings of firms with higher dividend yield, higher returns and higher growth.

2.5 UK Dividends and Taxes for Period Before and After the 1997 Tax Changes

The UK government operates a partial "imputation" company tax system, whereas the US operates a "classical" company tax system. The "imputation" system relates to corporation tax that is charged on firm profits but part of the corporation tax paid is taken into account when assessing shareholders' income tax. On the other hand, the "classical" company tax system treats shareholders and corporations independently when calculating their tax liabilities; thus, companies are taxed separately from their shareholders. Morgan and Thomas (1998) relate the significant differences that exist between the British and American tax system to the treatment of dividend income and capital gains, in which under classical system of taxation, the profits generated by a firm are subject to a corporation tax rate, which is not taken into account when assessing the tax owed by shareholders. When a firm distributes profits by making a dividend payment, the shareholder is taxed at his marginal income tax rate whereas, when profits are retained by the firm, the value of the shareholder's equity rises and becomes subject to capital gains tax. This system requires: (1) the firms to pay a corporation tax at flat rate on their profits; and (2) the shareholders to pay income tax on the dividend income they receive at their marginal rate of income tax. Under the classical system of taxation, the profits are therefore, subject to double taxation, either in the form of corporation tax and income tax[77], or as corporation tax and capital gains tax[78]. This also means that dividends, are in fact taxed twice, firstly, in the form of corporation tax on firm profits, and secondly, in the form of income tax on dividend income. Morgan and Thomas therefore conclude that the important outcome of the classical system is that both basic and high rate income tax payers may prefer profits to be retained by the firm rather than paid out in dividends, while the tax-exempt shareholders are ambivalent between dividends and retained profits.

Cannavan, Finn and Gray (2004) highlight that many developed countries operate some form of dividend imputation. Some countries, such as the UK, France, Italy, Canada and Ireland, operate partial imputation systems, whereas many others, including Australia, New Zealand, Mexico, Finland, and Norway, operate full imputation systems. A partial imputation system means that part of the corporation tax paid can be offset against personal

[77] Income tax is particularly for distributed profits.
[78] Capital gain is particularly for retained profits.

tax obligations, while in a full imputation system, all of the corporation tax paid can be offset against personal tax obligations. Under a dividend imputation tax system, corporate tax can be imputed against personal tax obligations on dividend income[79]. This effectively removes the double taxation of dividends which exists under the classical tax system discussed earlier. When a dividend is paid out of corporate profits that have been taxed at the statutory corporate tax rate, the shareholder receives the cash dividend plus an imputation tax credit. This tax credit can be used to offset personal income tax obligations.

Morgan and Thomas (1998) state that income tax rates have been significantly higher than the rate of tax on capital gains, in both the US and the UK, which under the classical system, has the effect of producing a "tax penalty" on dividend income. However, they argue that, since 1973, the UK has operated on an 'imputation' basis, aimed at reducing the disproportionate tax burden associated with dividend income; under this system, as described above, part of a company's tax liability is imputed to its shareholders, and treated as a prepayment of their income tax on dividends. An important outcome of the UK system is that tax-exempt shareholders prefer dividends to retentions; basic rate taxpayers are ambivalent between the two; and higher rate taxpayers prefer retentions. They also argue, since tax-exempt shareholders, including pension funds, are the most influential investors in many UK companies, therefore their tax preference for dividend income might result in significantly higher dividend payout ratios than would be chosen by companies in the absence of this tax bias. According to Rau and Vermaelen (2002), in the UK, high taxpaying individuals tend to prefer share repurchases to dividends (unless the share repurchase would generate substantial capital gains taxes) but, ceteris paribus, they would prefer an off-market repurchase (tender offer or private purchase) to an open-market buyback. However, low taxpaying individuals are indifferent to both dividends and share repurchases.

Given the scope of this thesis, the next section mainly discusses the impacts of the tax changes on the dividend and share repurchase preferences of tax-exempt shareholders. The tax and regulatory environment in the UK has changed dramatically over the last fifteen years and the following section further discusses the changes. The period is divided into two different parts: the period prior to July 1997; and the period after July 1997.

[79] Please refer to Appendix 1 for an illustration of an imputation system.

2.5.1 Period Prior to July 1997

Oswald and Young (2004) state that the UK has operated a partial imputation system of corporate taxation since 1973. Under this system, the income tax is deemed to have been partly deducted at source from distributions received by shareholders. As discussed earlier, an alternative approach was adopted with the intention to alleviate "double taxation", taking into account part or all of the corporate tax paid in calculating the personal income tax owed on dividend receipts. The imputed tax arises in the form of a credit that is able to be set against the income tax liability of shareholders on dividend income, which can be refunded in cases where the shareholder is tax exempt. The UK firms are allowed to pay corporation tax in two instalments during this period. Firstly, the ACT was assessed based on the amount distributed to shareholders, either through dividends or share repurchases. Secondly, mainstream corporation tax was payable approximately nine months after the end of the accounting period and firms could net-off the ACT already paid.

Hodgkinson (2002) describes the details of ACT in her paper in which a company that pays dividends actually pays ACT equal to BRIT multiplied by the gross dividends to the Inland Revenue Board (IRB). Hodgkinson provides a few illustrations with regards to the shareholder marginal tax rate. Firstly, in cases where the marginal tax rate for shareholder is higher than the BRIT, then the shareholder pays an additional amount to the IRB. Secondly, when the marginal tax rate for shareholders is lower, shareholders therefore, are entitled for rebate, which can be claimed from the IRB. Lastly, when marginal tax rate for investors is the same as the BRIT, no action is required. The study also suggests that whenever the taxable profits are equal to or higher than the gross dividends paid, the company may then deduct the ACT paid from their corporate tax liability. However, the maximum ACT offset is limited to the company's taxable profits multiplied by the BRIT, if they are lower. Surplus ACT actually refers to any ACT that is not offset[80]. Therefore, in cases where the company carries ACT forward, the delay in reclaiming the surplus ACT decreases the present value of the claim. Moreover, in case a high dividend is continued and the company has a finite life, the claim to surplus ACT may expire.

Share repurchases are one of the alternatives to dividend payments, through which companies can distribute their cash, as discussed in the previous section. Share repurchases were legalized in the UK through the Companies Act in 1981, but various regulatory bodies

[80] Refer Appendix 1 for further explanation on how surplus ACT arises.

have put restrictions on buy-back activity. The London Stock Exchange, for example, specifies certain limitations in order to avoid the manipulation of stock prices. In addition, the UK Companies Act, requires firms in financing its share repurchase should limit the amount to only profit available for distribution, otherwise the proceeds from a new shares issuance. This restriction was established by the Act to avoid causing damage to creditors. From another perspective, the UK is more concerned about insider trading than the US. Based on the Model Code[81], shares buy-back transaction cannot be realised by firms in periods where directors and officers are disallowed for trading off the company's shares. The UK regulators might require cancellation of all repurchased shares due to pre-emption rights of shareholders. Therefore, the flexibility of share repurchases might be limited in the UK market.

According to Rau and Vermaelen (2002), in the period prior to September 1994, all open-market share repurchases were unattractive for pension funds in comparison to dividends and repurchase tender offers (off-market share repurchase)[82]. Share repurchase is categorized as open market share repurchase when the sellers are not aware that they are selling shares to the company. In this case, the profit will be taxed as a capital gains tax. Therefore, tax credit cannot be claimed. On the other hand, the share repurchase is considered as off-market when the sellers are aware that they are selling the shares to the company. Under this case, there is no capital gains tax and therefore the tax credit is available for off-market share repurchase. Rau and Vermaelen further argue that the high-tax rate will lead to a preference for repurchase due to tax credit being available for off-market share repurchases, whereas the low-tax rate will result in preference for dividends. Off-market is attractive due to the tax credit given by the government. The investors also can earn arbitrage profits through that system[83]. To prevent the problem from occurring, the UK government has implemented rules to protect it, for example, the Inland Revenue will not allow a tax credit if it can show that the pension funds tendered the shares only for the tax credit. Therefore, the

[81] "This code imposes restrictions on dealing in the securities of a listed company beyond those imposed by law. Its purpose is to ensure that persons discharging managerial responsibilities do not abuse, and do not place themselves under suspicion of abusing, inside information that they may be thought to have, especially in periods leading up to an announcement of the company's results". (The statement as stated in Financial Services and Markets Act (FSA) Handbook).

[82] Rau and Vermaelen provide illustration on off-market share repurchase.

[83] The IRB will not grant a tax credit if it can show that the pension fund tendered shares only to obtain a tax credit. The same is true for private transactions in that the selling institution has to convince the Inland that it is It is not simply selling the shares to the company in order to obtain a tax credit. This means that share repurchases will be a very unattractive transaction for a company unless it repurchases the stock at a premium.

problem with repurchase is that there is no guarantee of tax credit. Due to that, the pension funds prefer dividends to share repurchases, whether off- or on-market.

Prior to September 1994[84], all open-market share repurchases were unattractive for pension funds relative to dividends and repurchase tender offers. In September 1994, investment banks invented the "agency buy-back", an innovative open-market repurchase mechanism that increased the tax attractiveness of stock repurchases in the open market. The introduction of agency buy-backs gave shareholders the option to sell their shares to a broker acting as the company's agent. Agency buy-backs were often completed in a few hours while normal open-market repurchases normally involved several small transactions over a period of several months. The agency buy-back appears to have been a repurchase in which all parties were able to participate. This is the easiest way to convince the IRB, where the anti-avoidance rules did not apply and hence, they were entitled to a tax credit. During the period, the agency buy-back was considered much more attractive than other off-market mechanisms.

In October 1996[85], the tax treatment on share repurchases was modified for tax-exempt investors, for example, pension funds, so that the investors might not recover any tax credit related to the element of distribution for off-market repurchase. During this period, for pension funds, all off-market and on-market repurchases were equally unattractive. The tax authorities abolished the loophole, making all open-market shares repurchase programmes tax inefficient again. When the tax credit given to tax-exempt pension funds was abolished, dividends became more the profitable way to return the cash to shareholders.

The period of September 1994 to October 1996[86], was the period in which some firm might have had more ACT surplus arising from dividends but were not able to offset against corporation tax due to maximum ACT offset limit requirement in the UK. Basically, the offset amount should be limited to tax payable on profit earned. However, the sources of income limited the UK operations and not the foreign income. Some of the firms in the UK generated more of its corporate income from operations outside of the UK and thus, were not entitled to offset the substantial ACT charge. Therefore, the introduction of Foreign Income

[84] Refer Rau and Vermaelen (2002) and Oswald and Young (2004).
[85] Refer Rau and Vermaelen (2002) and Oswald and Young (2004).
[86] Refer Rau and Vermaelen (2002) and Oswald and Young (2004).

Dividend (FID) was a partial[87] solution to reduce this problem. From the moment of FID implementation, the firms were then able of offset ACT with taxable profits derived from overseas. As a result, the firms with a high proportion of foreign earnings enjoyed reduction of tax on dividend payment.

2.5.2 Period After July 1997

In the July 1997 Budget, the abolishment of repayable dividend tax credits to pension funds became effective. The government changed the tax laws in such a way that pension funds, as in US, were indifferent to both dividends and share buy-backs. All tax credits, including those paid to dividends, were abolished. From that date onwards, institutions that had been categorised as "tax-exempt" were no longer allowed to claim tax credits. Rau and Vermaelen (2002) state that this scheme was primarily for the purpose of closing a loophole that allowed tax exempt institutional investors to reclaim tax credits on share reacquisition[88]. They further argue that, after this, pension funds became indifferent to both dividends and share repurchases, as was the case in the US. Oswald and Young (2004) also suggest that institutional investors' strong preferences for dividends declined following the abolition. The attractiveness of share repurchase rose again.

On November 25 1997, the then UK Chancellor, Gordon Brown, issued a pre-budget statement outlining a series of proposed reforms to the corporate tax system (Inland Revenue, 1997). Among others, a proposal to abolish ACT on qualifying distributions was also discussed. Effective from April 5 1999, the ACT was formally abolished for UK firms and, since July 1999, large[89] UK firms have been required to pay tax in equal quarterly instalments. The UK government introduced legislation stating that surplus ACT balances in the post-ACT regime should be used in a similar way and at a similar rate to under the old regime. The mechanism is known as 'shadow ACT'. Under this system, conventional payout methods, such as dividends and share repurchases, may still remain relatively unattractive to

[87] "This scheme is considered a partial solution as it did little to alleviate ACT problems for firms with low UK earnings and substantial accumulated cash surpluses and also because tax-exempt pension funds were unable to reclaim the tax credit on FIDs".

[88] "The tax treatment on share repurchases was modified for tax-exempt investors such as pension funds so that the investors could no longer recover any tax credit associated with the distribution element of an off-market repurchase. During this period, for pension funds, all off-market and on-market repurchases were equally unattractive".

[89] Large firms refer to those with profits in excess of £1.5 million.

firms with large surplus ACT carry-forwards. Oswald and Young (2004) conducted a study on changes in payout policies following the abolition of ACT. They observed an increase in the level of such payouts in the post-ACT regime. The results suggest that, following the abolition of ACT, the proportion of operating cash flow paid out in dividends by loss-making firms and low-profit firms increased substantially; that regular dividend payments responded positively to the abolition of ACT; and that the largest increases occurred among firms for which the agency costs of recurring surplus cash flows were highest. Aggregate dividends showed a modest increase in the post-ACT period despite the substantial erosions in corporate profitability, and this is consistent with the view that eliminating ACT helped reduce the tax costs of paying dividends for firms with low earnings. The following Figure 2.5 provides a summary of the tax changes in the UK over the last 15 years:

Figure 2.5: Summary of the changes in UK taxes over the last fifteen years[90]

Period	Particulars
Prior to September 1994	Since 1973, the UK has operated a partial imputation system of corporate taxation. Firms paid corporation tax in two instalments: 1. Advance corporation tax (ACT)[91] 2. Mainstream corporation tax All open-market share repurchases were unattractive to pension funds (relative to dividends and repurchase tender offers).

[90] The "summary of the changes in UK taxes over the last fifteen years" is based on illustration provided by Oswald and Young (2002) and Rau and Vermaelen (2002).

[91] Companies could then reduce their tax liability by deducting an amount representing profits distributed from their taxable profits. Many companies however, were unable to deduct the ACT as their taxable profits were less than amount distributed. Dividends paid by companies facing problems with surplus ACT were subject to taxation not dissimilar to the classical tax system.

September 1994 until October 1996	The UK introduced a partial solution[92] with respect to dividend payments, in the form of the Foreign Income Dividend (FID) scheme. This scheme enabled firms to set-off the ACT arising from dividends against overseas taxable profits. Investment banks invented the "agency buy-back", an innovative open-market repurchase mechanism[93].
October 1996 until July 1997	The tax authorities abolished the tax credit given to tax-exempt pension funds. By doing this, it abolished the loophole[94] and therefore made all open-market share repurchase programmes tax inefficient again. Dividends became a more profitable way of returning cash to shareholders.
July 1997 until April 1999	The UK abolished repayable dividend tax credits for tax-exempt pension funds. Institutional investors' strong preferences for dividends declined following the abolition as pension funds, as in the US, became indifferent between dividends and share buy-backs. As all tax credits, including those paid on dividends, were abolished, the attractiveness of share repurchases rose again.
After 1999	ACT was formally abolished for UK firms. From July 1999 onwards, large UK firms have been required to pay tax in equal quarterly instalments. Surplus ACT balances in the post-ACT regime have to be used in a similar way and at a similar rate to under the old regime.

Focusing on the UK evidence, the changes in the UK taxes and regulations show the importance of dividend and share repurchase issues, especially for tax-exempt shareholders,

[92] In the case of firms for which the majority of their corporate income was derived from foreign operations, firms would have a substantial ACT charge but little or no mainstream corporation tax against which to offset it. So, a partial solution was introduced with respect to dividend payments in the form of the FID scheme. This scheme enabled firms to set-off the ACT arising from dividends against their overseas taxable profits, thereby reducing the tax cost of paying dividends for firms with a high proportion of foreign earnings. This scheme is considered a partial solution as it did little to alleviate ACT problems to low UK earnings firms and substantial accumulated cash surpluses and also because pension funds were unable to reclaim the tax credit on FIDs.

[93] It increased the tax attractiveness of stock repurchases in the open market.

[94] The tax treatment on share repurchases was modified for tax-exempt investors such as pension funds so that the investors could no longer recover any tax credit associated with the distribution element of an off-market repurchase. During this period, for pension funds, all off-market and on-market repurchases were equally unattractive.

including pension funds. Benito and Young (2002) states in their study, that omitting dividend payments among quoted UK firms shows an increasing trend. Abolishment of pension funds tax credit for the payment of dividends (July 1997) as well as ACT in 1999 obviously had some impact on corporate taxation sources of income and therefore, might be a potential reason for the firms to omit dividends. Rau and Vermaelen (2002) state that the fact that corporate payout policies are sensitive to tax law changes in the UK which seems to be inconsistent with the fact that, after the US tax reforms, buy-back activity did not decrease, as stated by Bagwell and Shoven (1989). However, the results for both studies agree on the idea that the treatment of tax for the specific/important investors might influence firm's dividend policies. Pension funds, in this case, determine the firm's dividend policy, not the individual investor. On the other hand, Ferris et al. (2006) argue that, although the UK tax law changed in 1997, making high-dividend-yielding firms less attractive, they fail to find support for an independent tax effect on firm payout practices. Moreover, Auerbach and Hassett (2002) state that mature firms may continue to distribute dividends although the tax system reduced the attractiveness of dividendd. This is true when the mature firms may continue funding their investment over earnings retention and pay dividends as well. Additionally, some studies, for example Benito and Young (2002), and Ferris et al. (2006), suggest that firms might not easily substitute repurchases for dividends, based on the UK evidence.

The contradictory evidence questions the role of dividends in attracting institutional investors. If dividends are not a good signal of a firm's quality, perhaps other information is used. The following section discusses other potential information that could be used by institutional investors for investment decisions.

2.6 Other Determinants of Institutional Investment

Previous studies by Shefrin and Statman (1995), as well as Lakonishok, Scheifler, and Vishny (1994), describe the investment practice of institutional investors. They suggest that institutional investors have a preference for "glamour stocks"[95]. There might be a reason why they choose glamour stocks instead of other stocks. The motive for the investment might be related to prudent investment (to be seen as prudent). Lakonishok, et al. (1994) define glamour stocks as those with low ratios of "book-to-market", "earnings-to-price", and "cash

[95] Both studies highlight the fact that institutional investors do not perform well in their investments as they choose glamour stocks without considering objective risk characteristics.

flow-to-price" and "high growth in sales". Lakonishok, et al. (1994), as well as Shefrin and Statman (1995) also suggest that investment by institutional investors might relate to the size and "book-to-market returns". Another potential measure that could interest institutional investors is the stability of the dividends as discussed earlier in Chapter Two by Lintner (1956) and Del Guercio 1996)[96]. Britain (1964, 1966) as well as Fama and Babiak (1968) revaluated the Lintner's mathematical model and the findings support the view that firm managers have a preference for a stable dividend policy. Similarly, the firm managers might not increase dividends to a level in which they will not be able to sustain. Even though the study does not focus on institutional investors including pension funds in specific, but the need for dividend stability in that study may provide a potential explanation for institutional investment practice.

Ambarish, John and Williams (1987) provide a model to determine the level of dividends and investment used by "high-value" firms to distinguish themselves from firms having "low-value". The study concludes that firms which adopt stable dividend policy have a possibility to provide information about their true value to investors. The finding also suggests that this characteristic may be suitable in differentiating "high-value" firms with their "lower-value" counterparts with temporarily high payout levels. From a different perspective, Gombola and Liu (1993) examined the stability of dividends as a potential signalling tool as well as lower business risk indicator. The study suggests that the behaviour of high-yield dividend stock (US stocks) returns might be different, thus it might not be necessarily classified as homogeneous. Generally, the high-yield stock with a relatively stable dividend pattern exhibits returns behaviour which is different compared to high-yield stock with dividend policy which is relatively more volatile. Even though the study does not directly provide evidence that dividend stability influences institutional investment, it does highlight the importance of a stable pattern of dividend payments.

The above discussion provides evidence of the fact that investors might use other measures of quality for their investment practices. Apart from that, institutional investors may use different practices for investment compared to other investors, specifically individual investors. The following Figure 2.6 summarizes the research findings discuss in this section:

[96] Del Guercio (1996) shows that, while he cannot prove that dividends is a matter for portfolio selection, the stability of the dividend is proven to be an important indicator of prudent investment.

Figure 2.6: Summary for other determinant of institutional investment

Author (year)	Findings
Shefrin and Statman (1995); and Scheifler and Vishny (1994)	Institutional investors have a preference for "glamour stocks".
Lakonishok, et al. (1994)	Glamour stocks are defined as: 1. Low ratios of book-to-market 2. Low ratios of earnings-to-price; and 3. High growth in sales
Lintner (1956)	Managers might view investors as individuals/organisations that favour firms with stable dividend policies and, accordingly, they have a tendency to smooth dividend payments.
Fama and Babiak (1968)	Firm managers have a preference for a stable dividend policy.
Gombola and Liu (1993)	High-yield stock with a relatively stable dividend pattern exhibits returns behaviour which is different compared to high-yield stock with dividend policy which is relatively more volatile.

2.7 Conclusion

This chapter firstly discusses the relevant theories of dividends including dividend irrelevancy, dividend clientele, agency theory, dividend signaling and free cash flow theory of dividend. Secondly, the study provides literature on dividend signaling. Some of the researcher support that dividend can play as a tool for signaling purpose. However, some of the researcher argues that signaling through dividend is limited. The mixed finding discussed in this chapter questions whether dividend payouts are useful signal. Since the study focuses on dividends and institutional investors such as pension funds, this chapter discusses both institutional investors in general and pension funds in particular, with dividends. Institutional investor including pension funds is the major investor in UK Market and they are actually fiduciaries who invest on behalf of others. Therefore, pension funds UK pension funds are governed by respective laws among other to avoid a potential problem including speculating other people's money. Pension funds as tax exempt investor have gone through many tax changes in relation to dividend and share repurchase. Some of the changes may affect the preference for dividend or share repurchase. The contradictory evidence questions the role of

dividends in attracting institutional investors. The next chapter discusses the development of hypothesis in this study.

Chapter 3 : Hypotheses Development and Research Method

3.1 Introduction

The study questions whether dividends signal information and whether institutional investors, including pension funds, invest in firms based on this information. The study further argues that even if pension funds do not appear to be influenced initially by high dividends, they subsequently exert pressure on management to increase dividend payouts. This chapter explains the research design and hypotheses development of the study. Section 3.2 summarises the hypothesis development of the study. Firstly, the study provides details on pension funds and firms with high dividend payouts and explains the development of hypothesis 1(a), 1(b) and 1(c). Secondly, the study discusses the effect of pension funds on dividend and explains the development of hypothesis 2(a) and 2(b). Section 3.3 discusses the data collection process followed by the model and hypotheses testing in Section 3.4. The study provides explanation on data analysis in Section 3.5 and Section 3.6 concludes the chapter.

3.2 Hypotheses Development

As discussed earlier, the management of a firm may choose dividend payouts to signal good message in order to attract investment from investors such as pension funds. Allen and Michaely (2002), for example, argue that dividends convey information about the firm's prospects, and other information not previously known to the market. Benartzi, et al. (1997), however, shows that there is no clear relationship between dividend changes and future earnings growth and conclude that dividends predict the past and not future growth. Peterson (1996) also suggests that competition among firms creates noisy dividend signals. Inconsistency among researchers questions whether dividend payouts are effective signals. Dividend taxation might hinder the use of dividend payouts as a signalling tool (for example, see Hodgkinson, 2002); or attract dividend clienteles. Prior to 1997, the UK pension funds received a tax credit for their dividends which created a bias towards a preference for dividends, which was subsequently reduced (for example see Bell and Jenkinson, 2002). The

hypotheses, stated in their alternative forms, are presented in Figure 3.1 and explained further in the subsequent sections.

Figure 3.1: Summary of hypotheses, stated in their alternative form

Hypothesis 1a, 1b and 1c (section 3.2.1)

Hypothesis 1a: There is a positive relationship between last year's dividend payout and this year's pension fund ownership.

Full sample (period prior and post 1997):

$$Pfownit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 Sizeit + \beta 3 Growthit + \beta 4 Riskit + \beta 5 Levit + \beta 6 Abreturnit + \beta 7 Divstabit + \beta 8 Divi(t\text{-}1) X\, Dumbtxijt + e\, it \quad (3.1)$$

Sample period post 1997:

$$Pfownit = \beta o + \beta 1 Pfowni(t\text{-}1) + \beta 2\, Divi(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\, it \quad (3.2)$$

Hypothesis 1b: Pension funds increase their investment following increase in dividend payout.

$$\Delta Pfownit = \beta o + \beta 1 Pfowni(t\text{-}1) + \beta 2\, \Delta Divi(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\, it \quad (3.3)$$

Hypothesis 1c: There is a positive relationship between stable increases in dividend and pension fund ownership (Equation (3.1); (3.2); and (3.2)).

No evidence to support

Evidence to support

Implication	Implication
Management wishing to attract pension funds must use alternative devices to signal	Management wishing to attract pension funds should choose high dividend payouts policy to retain investment

Hypothesis 2a and 2b (section 3.2.3)

Hypothesis 2a: There is a positive relationship between last year's pension fund ownership and this year's dividend payout.

$$Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\, it \quad (3.10)$$

Hypothesis 2b: Firms increase their dividends subsequent to increase in pension funds investment.

$$\Delta Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 \Delta pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\, it \quad (3.11)$$

No evidence to support

Implication

Management can choose an optimal dividend payouts policy but must continue to focus on other factors, identified or otherwise, to retain pension funds investment

Evidence to support

Implication

Management wishing to retain institutional investors should increase dividend payouts and also continue to focus on other factors to retain pension funds investment

3.2.1 Pension Fund Investment Practices and Dividend Payouts

The dividend signalling hypothesis purports that firms use dividends to provide information to investors. Previous studies on dividend signalling, however, suggest mixed results. Whilst Aharony & Swary (1980); and Asquith & Mullins (1983) suggest that dividend changes are positively related to stock returns in the days near the dividend change announcement, others including Bernheim & Wantz (1995); Healy & Palepu (1988); Kao & Wu (1994); and Nissim & Ziv (2001) find an association between dividend increases and future profitability. DeAngelo et al. (1996) and Benartzi et al.(1997), however, do not find support for the dividend signalling hypothesis. These mixed findings question the signalling role of dividend.

Bhattacharya (1979) argues that managers use changes in dividends as a way to signal private information and reduce the information asymmetry that may exist between outside investors and corporate managers. Information asymmetry may be less of an issue, for pension funds as they are likely to be well informed. Amihud and Li (2002) suggest that institutions are more informed than other investors; Michaely and Shaw (1994), argue that institutional investors are sometimes privy to corporate information that individual investors do not have[97]. Therefore, the role of dividends for signalling may be less obvious for pension funds. Nevertheless pension funds may still be wary of firms who cut dividends. Chiang et al. (2006) suggest that investors like dividends to remain the same or increase over time. In short, they suggest that investors do not like dividend cuts, whether partial or total.

A high dividend payout might still be preferred by pension funds for tax or prudence reasons which could be achieved by either investing in high-dividend paying firms or by exerting pressure on management to increase dividend payout after investment. The first hypothesis, stated in its alternative form, examines whether pension funds tend to prefer high-dividend paying firms.

Hypothesis 1a: There is a positive relationship between last year's dividend payout and this year's pension fund ownership

Hypothesis 1b: Pension funds increase their investment following increase in dividend payout

[97] Holland and Doran (1998) argue that the private meetings with companies are a vital source of competitive 'knowledge advantage' for institutional investors.

As mentioned earlier in Chapter Two, Bond et al. (1995) suggest that the tax-exempt investors, including pension funds, are the most influential investors in many UK firms, and therefore, their tax preference for dividend income may result in significantly higher dividend payout compared to firms with an absence of this tax bias. In short, the advantage of dividends for tax-exempt investors may have created a demand for dividends. The tax-exempt investors, including pension funds, were not liable to pay income tax or capital gains tax before the tax changes took place in July 1997[98]. For that reason, they were allowed reimbursement of the imputation credit (20%). However, after July 1997, the attractiveness of dividends was reduced as the government removed the tax advantage. Therefore, the study assumes that the relationship between dividend payouts and pension funds is stronger in the period prior to the 1997 tax changes.

Even if a positive relationship between dividend payout and pension funds ownership is found, the next hypothesis questions whether or not pension funds refer to the stable increases in dividend in their investment decisions. Previous studies suggested that the stability of dividends plays an important role in portfolio selection[99]. Stability of dividends was already discussed in 1956 by Lintner in which he developed a quantitative model to test the stability of the dividend policy. He shows that firms pursue a stable dividend policy and gradually increase dividends given the target payout ratio. Many scholars have examined the stability of dividends[100] based on this model. The current study however, questions whether stable increases in dividend per share may attract pension funds investment. Based on a survey finding, Chiang et al. (2006) suggests that the initiation of a dividend might force the firm to continuously pay dividends in the future, because the market would respond directly to any changes in dividend payments[101]. Therefore, stable increases in dividend potentially influence investors including pension funds. The next hypothesis, stated in its alternative form, examines whether pension funds tend to prefer firms with stable increases in dividend policy.

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[98] Bell and Jenkinson (2002).

[99] Del Guercio (1996) argues that whilst the level of dividend payout does not play a significant role in portfolio selection stability of dividend payout is important. Ambarish, John and Williams (1987) also highlight the importance of dividend stability in portfolio selection.

[100] Refer Brittain (1964, 1966), Fama and Babiak (1968), Fama (1974), Adaoglu (2000), Aivazian et al. (2003a) Stacescu (2006),and Al-Yahyae, Palm and Walter (2010).

[101] Also see, for example, Aharony and Swary (1980), Charest (1978), Kwan (1981) and Woolridge (1983).

Hypothesis 1c: There is a positive relationship between stable increases in dividend and pension fund ownership

A positive relationship between dividend payout and pension funds ownership could be achieved either by pension funds investing in high dividend paying firms or by exerting pressure on management to increase their dividend payout subsequent to investment. Assuming pension funds prefer high dividends, the next section questions whether pension funds exert pressure on management to increase their dividend payout.

3.2.2 Dividend Payout and Pension Fund Ownership

Short et al. (2002) argue that institutions prefer dividends as they need "predictable" cash flows on an ongoing basis to fund their activities. Institutional requirements for certain levels of dividends to meet their own liabilities may force firms to pay out dividends at higher levels than they would actually prefer. As mentioned earlier, institutions, such as pension funds[102], are important investors in the UK market. In addition, investors in the UK have more opportunities to have discussions with the managers of firms[103]. Thus, if institutional investors need dividend income, perhaps their position as major investors, combined with opportunities to meet the appropriate personnel of firms, may allow them to exert influence. The next hypotheses, again stated in alternative forms questions the relationship between pension funds investment and a firm's dividend payout.

Hypothesis 2a: There is a positive relationship between last year's pension fund ownership and this year's dividend payout

Hypothesis 2b: Firms increase their dividends subsequent to increase in pension fund investments

[102] The ONS (2004) reports that institutions are important investors in the UK market, as around 80% of UK equity is held by financial institutions, primarily by insurance companies (17.2%), pension funds (15.7%) and overseas institutional investors (32.6%).

[103] ICAEM (2007, p. 12) reports the following statement:
"UK shareholders are more collegial in their engagement than their US counterparts and in particular the UK regulatory environment permits dialogue between boards and investors by not presuming that such dialogue represents privileged disclosure which is restricted by regulation Fair disclosure in the US".

This section explains the hypotheses development of the study. Firstly, the study highlights the conflicting evidence on whether dividends signal the true worth of the firm and whether pension funds tend to invest in high dividend paying stocks. If dividends play a role as signalling mechanism, they may well attract pension funds to invest in stocks. Some studies argue that institutions prefer dividends regardless of whether they act as a signalling tool and any tax bias, as they need cash flow on anon going basis to fund their activities. The study then questions whether pension funds invest in firms where they can exert pressure to increase dividend payout. The results of these two hypothesis can guide firms on the need to increase their dividend payout if pension funds are to be retained. On the other hand, if it appears that pension funds are attracted to firms that are already paying high dividends, managers may wish to ensure they maintain their dividend payout to retain existing pension funds investors and attract new pension funds as investors. The following section discusses the data collection for the study.

3.3 Data Collection

This study uses data extracted from Thomson One Banker based on the sample of non-financial firms listed on the London Stock Exchange for the period of March 1997 to December 2008. The month of March 1997 data is included since this is the only period for which data on pension fund ownership is available prior to an important change in tax legislation. As discussed in Chapter Two, the abolition of repayable dividend tax credits to tax-exempt pension funds became effective in the July 1997 Budget, and from that date onwards, tax-exempt institutions could not reclaim the tax credit payable on dividend income. Accordingly, Oswald and Young (2004) suggest that institutional investors' strong preferences for dividends declined following the abolition. This implies that the decision for pension fund investment, as well as managers' decisions about their dividend policies, might be different. Therefore, the inclusion of the March 1997 data is important in order to compare the difference between the periods before and after the tax change.

The study includes only firms for which all data is available. Accordingly, firms are excluded from the sample selection if missing data is reported by Thomson One Banker. One of the reasons for omissions is due to changes in firms' accounting year ends. For illustration, say a firm year-end is initially 31 September but the firm subsequently changed its year-end to 31 December, Thomson One Banker will report the value of as "N/A" (not applicable) for

the year of the change. In addition, observations are omitted from the current study for the following reasons:

* The study uses monthly share prices to calculate the standard deviation value and abnormal returns. If the share price is missing for certain months, neither the standard deviation value nor the abnormal returns can be computed; hence; observations with missing share prices are omitted.

* The measure for stable increases in dividend requires five year's dividend per share history. If this is not available the observation is omitted.

The following section describes the model and hypotheses testing, as well as defines the variables used in the study. The data are described in detail in Chapter Four.

3.4 Model and Hypotheses Testing

Section 3.2 discusses the development of the hypotheses. This section describes and explains the process of hypothesis testing. The first part tests the difference in the level of pension fund ownership between the sub-samples of dividend paying and non-dividend paying firms. The second part compares the difference in the level of pension fund ownership between high-dividend and low-dividend paying firms using both t-test and non-parametric test. The third part compares the difference in the level of pension fund ownership between stable increases in dividend and non-stable increases in dividend using both t-test and non-parametric test. The fourth and fifth part further discusses the tests on the relationship between dividends and pension fund ownership and whether pension fund exert pressure on management to increase dividend payout following investment or whether an existing high level of dividends is a necessary condition to attract pension funds investors.

Thomson defines pension funds as a qualified retirement plan set up by a corporation, labour union, government, or other organisation for its employees. The pension funds included in the database tend to be large with enough assets to be worthy of having their own dedicated staff. Several pension funds are state pensions. There are two types of pension funds[104]: first, the "Corporation Pension Fund", a pension fund for the employees of a public corporation that has an in-house investment department and the department may be managing

[104] Sourced from Thomson Reuters Customer Support.

a certain percentage of the company's pension fund assets in-house or the entire pension funds[105]; and second the "Government Pension Fund" which is a pension fund for government workers and is a government organisation such as a state, a city or a labour union that has an in-house investment department. The department may also be managing a certain percentage of the company's pension fund assets in-house or the entire pension fund.

3.4.1 Do Pension Funds Prefer Firms that Pay Dividends?

Total pension fund ownership is calculated, for each individual company, from March 1997 until December 2008 on a yearly basis. Thomson One Banker tracks ownership above 0.015% of outstanding shares and if the holding of an investor is less than that, then it does not track it[106]. The threshold differs from one country to another and the 0.015% threshold is applicable to UK stocks only. Thus, pension funds holdings which are less than 0.015%, might not be included in the calculation of total pension fund ownership. It is likely, however, that their exclusion will not greatly affect the current study since investors holding a very small percentage of ownership are unlikely to influence dividend policy. Some investors that hold more than the threshold may also be missing if they did not file on time or otherwise comply with requirements.

The study utilises a number of sub-samples. Firstly, firms are separated into two categories depending on whether or not they pay dividends. To test the difference in the level of pension fund ownership between dividend paying and non-dividend paying firms, the study firstly uses a t-test. The expectation is that dividend paying firms will attract more pension fund ownership than non-dividend paying firms. The t-test validity relies on three assumptions and, generally, the t-test is not valid if any one of these assumptions is violated. The first assumption is that the samples are drawn from normally distributed populations with unknown parameters. The second assumption is that the two samples are independent in the sense that they are drawn from different populations and/or the elements of one sample are not related to those of the other sample. The third assumption is that the population variances of the two groups are equal. In case any of these assumptions is violated, the study uses a non-parametric test, the Mann-Whitney test. The non-parametric test does not rely on these

[105] They actually manage assets, and do not solely use an external management service.
[106] Thomson One Banker source it ownership data through UK Registers, RNS, and Aggregated Mutual Funds.

assumptions discussed above. The next section examines whether the level of dividends is a factor influencing pension fund ownership.

3.4.2 Do Pension Funds Prefer High-Dividend Paying Firms?

The dividend-paying firms are further divided into two categories; low-dividend and high-dividend firms. The measure of dividends used to categorise the firms is based on the dividend yield as it is the commonly used measure in dividend signalling studies. Dividend yield is defined as the ratio of the firm's annual dividend to stock market capitalisation of the firm, or the annual dividend per share divided by the share price. Firms are classified in to the high or low category depending on whether their dividend yield is higher or lower than the median dividend yield for the sample. The level of pension fund ownership between the two groups is again tested using both a t-test and a non-parametric test.

3.4.3 Do Pension Fund Prefer Stable Increases in Dividend Firms?

The firms are now divided into two categories, stable increases in dividend and non-stable increases in dividend firms. A company is considered to have a stable increases in dividend policy when its dividend per share (adjusted for stock splits, for example) has increased over the last five years[107]. A firm that continuously increases its dividend per share during the last five years is considered as having a stable increases in dividend policy. However, if a firm's dividend per share has remained the same, decreased or fluctuated over the last five years, the firm is considered to have a non-stable increases in dividend policy. A dummy variable is chosen for this purpose, where the dummy equals 1 for stable increases in dividend and 0 otherwise. The level of pension fund ownership between the two groups is again tested using both the t-test and a non-parametric test.

[107] Ap Gwilym, et al. (2000) and Gombola and Liu (1993) assume that the period of five years was considered a long enough periods for a firm's dividend policy to become well established.

3.4.4 Does Pension Fund Ownership Follow an Increase in Dividends?

Following Grinstein and Michaely (2005), the study uses a regression model of company ownership to look at the effect of dividend policy on pension fund ownership. The focus in the current paper, however, is limited to pension funds, whereas Grinstein and Michaely's focus was institutional investors, which included pension funds[108]. According to Murphy and Van Nuys (1994), pension funds are the single largest group of institutional investors that are relatively both socially and politically visible as compared to other areas of the institutional investment market. Therefore, focusing on pension funds rather than institutional investors in totality will shed light on whether those characteristics influence their investment choices. Grinstein and Michaely (2005) examined the US market whereas the current study provides evidence of pension funds behaviour in the UK. Grinstein and Michaely's model is adapted by including additional variables of interest which are potentially of particular concern to pension funds due to the prudent man concept discussed earlier. The expectation is that pension funds will prefer a stable increases in dividend payout. Hence, the current study includes a stable increases in dividend variable, and relatively low leverage measured as the ratio of debt to equity. Pension funds are likely to need cash on an on-going basis as discussed in Chapter Two[109]; hence, the stable increases in dividend might be an important factor for pension funds' investment decisions. The leverage variable reflects the potential concern for risk which might be faced by pension funds.

In addition to comparing the mean and median pension fund ownership of high and low dividend paying firms using t-test and non-parametric test, regression analysis is used to test the hypotheses on: (1) whether a positive relationship exists between last year's dividend payout and this year's pension fund ownership; (2) whether pension funds increase their investment following an increase in dividend payout and (3) whether a positive relationship exist between stable increases in dividend and pension funds ownership. The following model, adapted from the model in Grinstein and Michaely (2005), is used to test the hypotheses:

[108] The Grinstein and Michaely (2005) model also includes pension fund ownership in their test.
[109] Refer to Short, et al. (2002).

Full sample (prior and post 1997 period):

$$Pfownit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 Sizeit + \beta 3 Growthit + \beta 4 Riskit + \beta 5 Levit + \beta 6 Abreturnit + \beta 7 Divstabit + \beta 8 Divi(t\text{-}1) X\, Dumbtxijt + e\, it \quad (3.1)$$

Sample post 1997 period:

$$Pfownit = \beta o + \beta 1 Pfowni(t\text{-}1) + \beta 2\, Divi(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\, it \quad (3.2)$$

$$\Delta Pfownit = \beta o + \beta 1 Pfowni(t\text{-}1) + \beta 2\, \Delta Divi(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\, it \quad (3.3)$$

The study firstly includes full sample firms including prior and post 1997 period to test the effect of the tax changes on dividend. The inclusion of sample firms for the prior to 1997 period allows the variable, "dividends prior to 1997 period" *(Divit-1X Dumbtxij*) to be tested (Equation (3.1)). However, the inclusion of the sample firms does not allow the study to include the lag of pension fund ownership, i.e. the original model of the study. The pension fund ownership data provided by Thomson One Banker is only for the period March 1997 onwards. Therefore, last year's ownership data for period prior to 1997 is not applicable, thus limiting generalisation of the results of the study. Ignoring the tax effects, the study then excludes the prior to 1997 period and uses the Equation (3.2) to test the hypotheses of the study. Equation (3.3) tests whether the changes in dividends influence the changes in pension funds to establish the causality effect among the variables. The following paragraphs (Figure 3.2) provide a summary as well as full description of the variables used in the study.

Figure 3.2: Definition of variables for Equations (3.1); (3.2) and (3.3)

Variables	Definition
Pfown	Pension fund ownership is defined as the aggregate number of shares of stocks i owned by all pension funds in the sample at 31st December of year t, divided by the total number of shares of stock i as at 31st December of year t.
ΔPfown	Change in pension funds is defined as a change of pension fund ownership at year t and year t-1.
Div	Dividend variable is defined as (1) dividend yield at year t-1 which is the ratio of the firm's annual dividends at year t-1 to stock market capitalisation of the firm at year t-1; and (2) dividend to book value which is the ratio of the firm's annual dividends at year t-1 to book value of the firm at year t-1. This model uses last year's dividend rather than current dividend due to an assumption that the decision to increase or decrease the pension funds investment might take time to take effect considering the influence of dividend payout.
ΔDiv	Change in dividends is defined as a change of prior year's dividend. Dividend variable is defined as: (1) dividend yield; and (2) dividend to book value.
Size	Firm size is proxied by log market capital.
Growth	Growth opportunity is defined as the market to book ratio.
Risk	Risk is defined as standard deviation of return of stocks.
Lev	Leverage is the ratio of total debt to equity.
Abreturn	Abnormal return is the annual returns on the stock in year t minus the beta returns of the stock.
Divstab	Stable increases in dividend - the dummy equals 1 if the dividend per share continuously increases for five consecutive years, otherwise 0.
Div X Dumbftx	Dividend at year t-1 multiplied by "dummy prior 1997 tax changes". Dummy prior 1997 tax changes equals 1 for prior 1997 period and 0 otherwise.

The adaptations are as follows:

1. The current study uses market capitalisation to represent the size of the firm rather than sales.
2. The current study uses standard deviation of annual rate of returns on investment rather than beta to represent risk of the firm.
3. The current study includes two extra variables, stable increases in dividend (Divstab) and the leverage (Lev), as additional variables.
4. Similar to the Grinstein and Michaely's model, other variables included are the market to book ratio to represent the growth opportunities (Growth); the annual returns on the stock in year t minus the beta returns of the stock, which denotes abnormal return (Abreturn).

3.4.4.1 Pension Fund Ownership

Pension fund ownership is defined as the aggregate number of shares of stocks i owned by all pension funds in the sample as at 31st December of year t, divided by the total number of shares of stock i as at 31st December of year t. Assuming that current pension fund ownership is a function of previous year's ownership, the lag of pension funds is included in the model. The current study uses the level of pension funds in equation (3.1) and (3.2); and changes of pension funds in equation 3.3. A change of pension funds is defined as a change of pension fund ownership at year t minus the pension fund ownership at year t-1.

3.4.4.2 Dividend

The dividend variable is defined as dividend yield which is the ratio of the firm's annual dividends to stock market capitalisation of the firm, or equivalently, dividend per share divided by the share price. Jun, Gallagher and Partington (2010); and Chen and Cheng (2006) also use dividend yield as a proxy for dividends. Grinstein and Michaely (2005) use dividend to book value in their model to avoid the influence of market price of stock on the dividend variable. The current study also repeats the analysis using the same definition to better understand the pension funds investment. This model uses last year's dividend rather than current dividend due to an assumption that the decision to increase or decrease the pension funds investment might take a period of time to take effect considering the influence of

dividend payout. A positive relationship is expected between dividend and pension funds investment.

3.4.4.3 Size

Rationally, large firms relate to mature and established firms, and institutional investors, including pension funds, may invest in large firms to be considered a prudent investment. The inclusion of this variable in the model is to determine whether or not size influences pension funds investment. The current study uses market capitalisation as a proxy for size following Jun et al. (2011) instead of using sales, as in the original Greinstein and Michaely's model. A positive relationship is expected between size and pension funds investment.

3.4.4.4 Growth

Previous research (refer Lakonishok, et al., 1994; Del Guercio,1996; and Chen and Cheng, 2006) suggest that institutional investors invest more in higher growth stocks measured by market to book ratio. Chen and Cheng (2006) also report that investors increase holdings of firms with higher dividend yield, higher returns and higher growth[110]. The current study uses market to book ratio as a proxy for growth opportunities. A positive relationship is expected between growth and pension funds investment.

3.4.4.5 Risk

The inclusion of the risk of the stock as a variable questions whether institutional investors prefer low or high risk firms. Douglas and John (1997), in their book, suggest that investment is considered risky because of the uncertainty about the future returns and the possibility of large negative returns. However, investment decisions must be made before the outcome is known. The prudent man concept might encourage institutional investors to invest in firms with low risks, thus lowering their risk portfolio. On the other hand, pension funds may be prepared to accept higher risks in return for higher expected returns and may thus be attracted

[110] The results for control variables are consistent with prior studies. Institutional investors increase holdings of firms with lower return volatility, higher dividend yield, higher returns, more earnings momentum, stronger prior institutional demand, lower EP, lower BP, or higher growth.

to firms with high risks. O'Brien and Bushan (1990), Creedy (1994) and Badrinath et al. (1989) suggest that risk (proxied by beta) is positively and significantly related to institutional ownership. In short, the findings suggest that institutions accept higher risk firms, presumably with the hope of high compensating returns. Eakins, Stansell and Weirtheim (1998), however, argue that the hypothesis that institutions prefer higher risk firms is not consistent with the notion that institutions are motivated to appear prudent[111]. Eakins, Stansell and Weirtheim also examined the relationship between beta and institutional investment and their initial findings suggest that institutional investors seek high beta stocks and avoid low beta stocks. However, when they further tested for nonlinearities, their results suggest that the relationship between institutional investment and beta is not linear as institutions appear to avoid the stocks with very low and very high betas.

The current study however, uses standard deviation instead of beta to measure risk due to the following reasons. Firstly, standard deviation measures the risk of individual stocks, while beta measures the risk of the market as a whole; secondly, standard deviation measures total risks while beta measures total volatility: and thirdly, standard deviation measures both systematic and unsystematic risks while beta measures the risks investors are compensated for. The current study focuses on pension funds rather than all institutional investors and it might be expected that the prudent man concept is stronger for pension funds. Therefore, the study includes this variable to further understand the role of risks in pension fund investments.

According to Kolb (1992) standard deviation can be defined as "a measure of the dispersion of returns from their mean and the greater the chance of getting a result far away from the mean, the greater the risk of a particular investment". In simple words, standard deviation measures the investment returns' volatility (risk) compared to the average returns, also known as historical volatility. Standard deviation is calculated as the square root of variance for the individual firms as follows:

$$s = \sqrt{\frac{\sum_{k=1}^{n}(r_k - r_{expected})^2}{n-1}} \qquad (3.4)$$

[111] O'Brien and Bushan (1991) suggest that institutions require information, both as the basis for investment decisions and to satisfy the standards of fiduciary responsibility. In brief, if they are sued by beneficiaries for poor investment performance, fiduciaries are held to a 'prudent person' standard, which means that they must exercise the care and judgment that a person of ordinary prudence and intelligence would exercise in dealing with his or her own property, under the circumstances existing at the time.

Where, s is standard deviation, r_k is specific returns, $r_{expected}$ is expected returns and n is number of returns. To calculate the standard deviation, firstly, the study calculates the monthly returns for the individual firms using the formula below:

$$\frac{P_t - P_{t-1}}{P_{t-1}} \quad (3.5)$$

Where, P_t is the price at month i and P_{t-1} is the price for the previous month. The next step is to calculate the average monthly returns on investment (n=12 months) for each individual firm year. Based on the above formula, the study then calculates the standard deviation for each firm year. A negative relationship is expected between risk and pension fund investment.

3.4.4.6 Leverage

Grinstein and Michaely (2005) do not consider leverage as a factor that influences institutional ownership, but high leverage might be a concern for pension funds as it increases the risk of bankruptcy. Hence, a variable measuring leverage is included in the current study and is represented by the ratio of total debt to equity. A negative relationship is expected between leverage and pension funds investment.

3.4.4.7 Abnormal return

Pension funds may be attracted to invest in firms with a history of past high returns in the expectation that these may continue; hence, abnormal returns, is included as a variable in the regression analysis to capture this. The beta computed above is used to calculate the yearly abnormal return. An abnormal return can be defined as a return that differs from what might otherwise have been expected given a company's beta and the market returns. An abnormal return can be positive or negative depending on whether the stock has outperformed (positive) or underperformed (negative) to expectations. The abnormal return variable for each company is calculated as follows:

$$Ab_{i,t} = R_{i,t} - E(R_{i,t}) \quad (3.6)$$

Where, $R_{i,t}$ is the yearly returns of stock *i*, and E($R_{i,t}$) is the yearly returns on the LSE all stock index. The study collects the yearly returns percentage for both the stock and the market as follows:

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} \tag{3.7}$$

Where, P_t is the price at year i and P_{t-1} is the price for the previous year. Based on the above formula, the study then calculates the returns for the individual stocks ($R_{i,t}$), and the LSE all stock index. The expected return (E($R_{i,t}$)) is calculated by multiplying the beta of the stock and LSE all stock index return.

Grinstein and Michaely (2005) also include an abnormal return variable in their study. It might be expected that pension funds will be attracted to high abnormal return stocks. In an efficient market, however, the random walk hypothesis suggests that there is no reason why high returns will continue. Pension funds might have identified the possibility of high returns prior to their occurrence, invest and thus enjoy the high returns and subsequently retain their ownership. It is expected that there is a positive relationship between abnormal return and pension fund investment.

3.4.4.8 Stability Increases in Dividend

As discussed, pension funds are subject to the prudent man concept and may thus require a stable flow of funds via a stable dividend payout. Hence, this study questions whether dividend stability encourages pension fund ownership. However, the current study focuses on the stability increases in dividend rather than dividend stability. Grinstein and Michaely (2005) do not consider the role of stable increase in dividend in encouraging pension fund ownership. Del Guercio (1996) shows that, while he cannot prove that dividends play a significant role in portfolio selection, the stability of the dividend is proven to be an important indicator of prudent investment. Del Guercio (1996) provides evidence that suggests the stability of dividends is one of the institutional investor's prudent investment indicators. His US study examined the role of dividends in portfolio selection. He found that dividend yield has no power in explaining banks' portfolio choices and is actually a negative indicator in

mutual funds' portfolio choices. Therefore, his study argues that dividends do not play a major role in portfolio choice. However, he suggests that the prudent-man rule does play an important role. Since the stability of the dividends is a prudent investment indicator, it is considered an important factor in the institutional investor's portfolio selection. Therefore the current study questions whether pension funds seek firms with stable increases in dividend policies for investment and thus includes a stable increases in dividend variable in the model.

Ap Gwilym, et al. (2000) calculates dividend stability on a monthly basis, using the previous 60 months of dividend data. They use two different definitions of stability in their study. The first measure of stability is the standard deviation of a stock's dividend yield and the next is an extension of the work of Gombola and Liu (1993). The illustrations for calculating the dividend stability reported in Ap Gwilym et al.'s study are as follows:

(1) Standard deviation of a stock's dividend yield:

$$ST1t=\sqrt{\frac{\sum_{T=t-1}^{t-60}(DYT-DTa)^2}{59}} \quad (3.8)$$

Where, ST1t represents the standard deviation of the dividend yield, DYT represents the dividend yield in month T and DTa is the average dividend yield of the stock over the period between the current month t-1 and the month t-60.

(2) Extension of Gombola and Liu (1993)

$$ST2t=\sqrt{\frac{\sum_{i=1}^{n}(Di-Di-12)^2}{Dat}} \quad (3.9)$$

Where, for all Di<Di-12, where ST2t is the stability of a stock in month t, Di is the sum of the regular dividend payments arising in the previous 12 months, n is the number of times the condition Di<Di-12 is satisfied in the 60 months prior to t, and Dat refers to the average annual dividend payment between months t and t-59 inclusive. In this model, they assume that the period of five years is considered a long enough period for a firm's dividend policy to become well established.

However, both measures of stability are not applied in the current study. Pension funds may need a constant flow of dividends to meet, for example, its own current liabilities[112]; thus, constant increase of dividend per share is expected to be more important. The definition of stable increases in dividend is in line with Lintner (1956) who suggests management of the firm should focus on the change in dividends rather than amount of dividends. The current study assumes that the firms are considered to have a stable increases in dividend policy when a firm's dividend per share (adjusted for stock splits, for example) has increased over the last five years. The current study compares five continuous years following Ap Gwilym et al. (2000) and Gombola and Liu (1993) to assume the dividend policy[113] is well established. A dummy variable is chosen for this purpose where the dummy equals 1 if there is stable increases in dividend and 0 otherwise. The current study questions whether firms that have increased dividends for the last five years may attract pension funds investment. Therefore, a firm that has increased its dividend per share during the last five years is considered as adapting stable increases in dividend policy. However, if a firm's dividend per share has remained the same, decreased or fluctuated over the last five years, the firm is considered to have a non-stable increases in dividend policy. The following Figure 3.3 illustrates the steps for coding the firm as having stable increases in dividend policy. Let us say the dividend per share for firm A, B, C, D, E and F for five years period is as follows:

Figure 3.3: Code of stable increases in dividend

Firm	Dividend per share					Category	Code
	Year 5	Year 4	Year3	Year2	Year1		
*A	0	0	0	0	0	Non-stable	0
B	1	2	2	1	0	Non- stable	0
C	2	2	3	4	5	Non- stable	0
D	1	1	1	1	1	Non-stable	0
E	2	2	2	1	1	Non-stable	0
F	5	4	3	2	1	Stable	1

* Non-paying dividend firms is also considered as non-stable dividend firm

[112] Short et al. (2002) argue that institutions prefer dividends as they need 'predictable' cash flows on an ongoing basis to fund their activities. Accordingly, they stated that institutions invest in equities in order to provide returns to fund their activities, such as paying pensions, paying out on insurance policies and many others.

[113] Ap Gwilym, et al. (2000) and Gombola and Liu (1993) assume that the period of five years was considered a long enough periods for a firm's dividend policy to become well established.

Dividend per share is the amount of dividends that a stockholder will receive for each share of stock held. It is estimated using the total cash dividends divided by the total shares outstanding. The dividend per share data is adjusted for stock splits, so that the data is comparable between years. It is expected that a positive relationship exists between stable increases in dividend and pension funds investment.

3.4.4.9 Dividends for Prior 1997 Period

Pension funds, as discussed in Chapter Two along with other tax exempt investors, were able to reclaim tax credits attached to dividends, prior to July 1997. For that reason, pension funds would have held a high proportion of stocks with a high dividend payout prior to this change in legislation. Therefore, the current study expects tax-exempt shareholders, including pension funds, to have preferred dividends to retentions before the 1997 tax changes. Firstly, the current study defines "dummy prior 1997 tax changes" equals 1 if the period is before Jul 1997 and 0 otherwise. To test whether dividends for prior 1997 period influence pension funds investment, the current study multiplies the dividend yield with the dummy prior and post 1997 tax changes. It is expected that there is a positive relationship between "dividend X dummy prior 1997 tax changes" and pension fund investment. However, this variable is only applicable and tested in Model 1 (dependent variable is the level of dividends) and not in model 2 (the dependent variable is a change in pension fund ownership) since the change in pension fund ownership data is not available for period prior 1997.

It is well understood that correlation is not causation as causality brings up the relationship between the effects and the causes (Green 2012). In other words, causality exists when one set of events is a direct consequence of another set of events. The equation (3.1) and (3.2) tests the first hypothesis which questions whether there is a relationship between pension fund ownership and dividend payout but does not imply causality. The equation (3.3) however tests the direct consequences between "changes in last year's pension fund ownership" and "changes in this year dividend payout". This model may establish the causality effect among the events in which a positively significant relationship between the variables may suggest that pension funds increase investment following an increase in dividends.

3.4.5 Does Pension Fund Ownership Precede an Increase in Dividends?

This section describes the process used to test the hypotheses 2(a) and 2(b). Hypothesis 2(b) questions causality on whether firms increase their dividend payout subsequent to pension fund investments. The rest of this section explains the model equation and defines each of the variables used in the equation (Figure 3.4).

$$Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\, it \quad (3.10)$$

$$\Delta Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 \Delta Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\, it \quad (3.11)$$

Figure 3.4: Definition of variables for Equations (3.10) and (3.11)

Variables	Definition
Div	Dividend variable is defined as: (1) dividend to book value at year t which is the ratio of the firm's annual dividends at year t to book value of the firm at year t; (2) dividend per share at year t, which is the annual dividends divided by the number of shares outstanding; and (3) dividend to earnings which is the ratio of the firm's annual dividend at year t to earnings at year t or equivalently dividends per share at year t divided by earnings per share.
ΔDiv	Change in dividend is defined as a change of dividends at year t and year t-1. Dividend variable is defined as: (1) dividend to book value; (2) dividend per share; and (3) dividend to earnings.
Pfown	Pension fund ownership is defined as the aggregate number of shares of stocks i owned by all pension funds in the sample at 31st December of year t-1, divided by the total number of shares of stock i as at 31st December of year t-1.
ΔPfown	Change of pension fund ownership is a change of last year's pension fund ownership.
Size	Firm size is proxied by log market capital.
Growth	Growth opportunities is defined as the market to book ratio.
Profit	Profitability is defined as return on equity (ROE) which is a ratio of net income to average common stockholders' equity.

Variables	Definition
Liquidity	Liquidity is defined as current ratio which is the ratio of current assets to current liabilities.
Lev	Leverage is the ratio of total debt to equity.

Notes: Subscript i in the regression index the firm and t denotes the year.

The adaptations are as follows:

1. The current study uses market capitalisation to represent the size of the firm rather than sales.
2. The current study includes three extra variables: profitability; liquidity; and leverage, since these variables have been widely used in dividend studies, but excludes the variables: risk (beta) and abnormal return.
3. Similar to the Grinstein and Michaely's model, another variable included is the market to book ratio to represent growth opportunities.

Previous studies show that a firm dividend policy might be related to its characteristics, including size, growth opportunities, profitability, liquidity and leverage. The size of the firm, profitability and growth opportunities are the significant factors related to dividend payout[114]. Larger firms tend to be more mature and thus have easier access to the capital markets, which reduces their dependency on internally generated funding, thus allowing for higher dividend-payout ratios[115]. In the same way, it is assumed that firms with higher profits have a tendency to pay higher dividends. On the other hand, the higher the growth opportunities available to a firm the lower will be the dividend payout. Allen and Michaely (2004) suggest that the dividend payout seems to be higher for firms with freely available cash flow as well as limited growth opportunities. Fama and French (2001) and De Angelo et al. (2004) also find that large, profitable firms pay more dividends than those with more investment opportunities. The survey by Baker et al. (2012) suggests that managers are of the opinion that growth opportunities, low profitability and cash constraints might influence firms not to pay dividends.

Other factors, including liquidity and leverage, have the potential to influence dividend policy. Theoretically, liquidity also matters in establishing the dividend policy,

[114] Allen and Michaely, 2004); Fama and French, 2001; and De Angelo et al. (2004) find that large firms pay more dividends.
[115] Lloyd et al. (1985) and Vogt (1994).

because dividends represent cash outflow. The more available the cash flow, the greater is the firm's ability to pay dividends[116]. Leverage, on the other hand, describes how a firm finances its growth internally (through retained earnings); or externally (through debt or equity issuances). Previous studies report negative relationship between leverage and dividend payout[117].The following sections further discuss the variables used in the study to further understand its relationship with dividend payout.

3.4.5.1 Dividend

The current study uses level of dividends in equation (3.10) and changes in dividend in equation (3.11) as dependent variable. Equation (3.10) establishes the relationship between pension funds and level of dividends. As causality is examined, the level of dividends is replaced by changes of dividends in equation (3.11). The model tests in part, whether the changes in dividends in year t, are influenced by changes of pension fund ownership in year (t-1). If the management increases the dividends following an increase in the last year's pension fund ownership, this might suggest that pension funds have the capacity to exert pressure on management to increase dividend payout, thus lending support for Hypothesis 2b. The current study uses changes of last year's pension fund ownership rather than changes in this year ownership as it is expected to take a period of time for pension funds to exert power on management to increase dividend payout.[118] The changes in dividend defined as the changes in dividend in year t minus the dividend changes in year (t-1).

Following Greinstein and Michaely (2005), one (1) year lag of pension funds is applied in the model. The lagged divided variable is incorporated in the model to show the need for management to follow a stable dividend policy. Management may allow the prior dividend policy to influence the current dividend policy to be established. Therefore, the inclusion of the lag may prevent the auto-correlation of dependent variable. Lintner (1956) suggests that past dividends are the primary determinants of changes' in dividends paid out.

[116] DeAngelo et al. (2004) suggests that there is positive relationship between liquidity and dividend payouts behaviour.

[117] Jensen, Donald and Zorn (1992); and Asif, Rasool and Kamal (2001).

[118] The time it takes institutions to respond to changes in payout might be different from the time it takes institutions to affect change firm's payout policy. Institutions react fast to news and that information in the beginning of a quarter can affect institutional holdings at the end of that quarter (e.g., Sias, Starks, and Titman (2001)). On the other hand, it might take and institution some time to sell a large portion of its shares if the market is not liquid enough. They expect that institutional holdings will have a slower effect on payout policy, since it takes time for institutions to affect a board's decision making.

Additionally, he reports that the management should focus on the change in the dividends rather than the amount. As dividend payout is now the dependent variable, it is essential to include the firm characteristics which might influence dividend payout.

3.4.5.2 Size

Lloyd et al. (1985) and Vogt (1994) argue that firm size plays a role in explaining the dividend-payout ratio of firms. They document that larger firms tend to be more mature and thus have easier access to the capital markets, which reduces their dependency on internally generated funding, thus allowing for higher dividend-payout ratios. In the same way, Allen and Michaely (2004) state that firms with the highest dividend payout tend to be large, mature firms with a lots of free cash flow and few growth opportunities. According to those arguments and potential agency problems as discussed in the literature review, the current study expects that the issues of signalling to be more important for larger firms suggesting that such firms may be less likely to reduce dividends. A recent research by Rafique (2012) also reports that firm's size has a significant relationship with dividend payout[119]. A positive relationship is expected between firm size and dividend payout.

3.4.5.3 Growth

Growth is another variable included in the model and is proxied by a company's market to book value. Rozeff (1982) suggests that the dividend payout is a significantly negative function of a company's past and expected future growth of sales. Chen et al. (1999) find that growth is negatively and highly significantly related to dividend policy. From another perspective, La Porta et al (2000) find that in countries with better protection for minority shareholders, fast growing firms tend to pay lower dividends than slow growth firms. They suggest that legally protected shareholders are willing to wait for their dividends when the company has access to other investment opportunities. A negative relationship is expected between growth and dividend yield.

[119] Rafique (2012) conducted research in the Pakistan market using six independent variables including earnings, firm size, growth, profitability, corporate tax and financial leverage. He found that only corporate tax and size influence the dividend payouts.

3.4.5.4 Profitability

The inclusion of profitability as an independent variable in the model is based on the assumption that "the higher the profits generated, the higher the dividend payout". Conversely, if profits are low, dividend payout should be low as well. Fama and French (2001) suggest that profitability is an important factor in establishing the firm's dividend policy. Jensen et al. (1992) also report that profitability has a positive effect on the dividend payout of US firms. A research by Jakob and Johannes (2008) find high ROE influences the dividend payers in the Danish market. Similarly, Harada and Nguyen (2011) also report that the increases in profitability tend to increase the likelihood of dividend increases in the Japanese market. Previous research has used either ROA or ROE as a proxy for profitability. ROE measures profitability from the common stockholders' point of view in which the ratio shows how many pound of net income are earned for each pound invested by the owners. ROE is computed by dividing the net income to average common stockholders' equity. The current study uses ROE as a proxy for profitability and positive relationship is expected between ROE and dividend payout.

3.4.5.5 Liquidity

One of the issues discussed in previous research relates to the free cash flow view. The payment of dividends, is among others, the way to reduce the extent of over-investment by managers (refer Easterbrook, 1984 and Jensen, 1986). In addition, the ability to pay dividends relies mostly on cash flow or liquidity. Liquidity ratios measure the short term ability of the firm to pay its maturing obligations and to meet unexpected needs for cash. Therefore, the liquidity variable is included in the model assuming the ability to pay dividends is related to the firm's liquidity. DeAngelo et al. (2004) suggest that there is a positive relationship between liquidity and dividend payout behaviour. This study uses current ratio as a proxy for liquidity. Current ratio is defined as the ratio of current assets to current liabilities. A positive relationship is expected between liquidity and dividend payout.

3.4.5.6 Leverage

Leverage describes how firm's finance their growth internally (through retained earnings) or externally (through debt or equity issuances) and is represented in the current study by the

ratio of debt to equity. A company that is highly leveraged has more debt obligations and interests to pay. Jensen (1986) therefore suggests that debt could serve as a substitute for dividends to reduce agency problems. A highly leveraged firm will be expected to change its dividend policy in line with its performance and this should reduce the importance of dividends in alleviating agency problems. Jensen, Donald and Zorn (1992) report a negative relationship between leverage and dividend payout. A study by Asif, Rasool and Kamal (2001) also suggests that financial leverage has a negative impact on dividend payout, indicating less dividend payments by high-debt firms and likewise, a negative relationship is expected in the current study.

3.5 Data Analysis

The study uses panel data regression analysis to test all the hypotheses. Specific test are carried out to test the regression assumptions, including linearity, normality, homoscedasticity and auto-correlation. The Hausman test is conducted to choose between the fixed effects and random effects model (the Hausman test is further discussed in Chapters 4 and 5). The study reports the results based on robust cluster standard errors of the panel regression analysis used to cater the problem of outliers, heteroskedasticity and autocorrelation using Stata 10 package. Ramsey test also conducted to examine the problem of omitted variables in the model. The fixed effects panel regression analysis may reduce the problem of omitted variables in the model. Panel data regression analysis might not be suitable if the dependent variable has a censoring value (for example, firms with zero pension fund ownership). Panel Tobit regression analysis is more preferable in case of data with censoring value (Green 2012). Tobit[120] analysis is designed to improve estimates when there is either left or right censoring. In this case, left censoring occurs as the minimum value of the dependent variable (e.g.: pension fund ownership) is equal to 0. However, the Tobit regression analysis is designed for random effects model. In other words, there is no command for a conditional fixed effects s model in Stata, as there does not exist, a sufficient statistic allowing the fixed effects to be conditioned out of the likelihood. Additionally, there is no robust test provided by Stata for Tobit regression analysis. The study therefore proceeds the analysis using panel data regression analysis but with sub-sample firms "with pension fund ownership" for Equation (3.1); and Equation (3.2) and sub-sample firms "dividend

[120] The Tobit model is a statistical model proposed by James Tobin (1958) to describe the relationship between a non-negative dependent variable and an independent variable (or vector).

paying firms" for Equation (3.10). The analysis using panel data regression analysis is also applied for Equation (3.3) and Equation (3.11).

3.6 Conclusion

This chapter discuss the hypotheses development of the study. The first hypothesis questions whether a positive relationship exists between last year's dividend payout and this year's pension fund ownership. Focusing on the same issue, the second hypothesis questions whether pension funds increase their investment following an increase in dividend payout. The third hypothesis questions whether stable increases in dividend influence the pension funds investment. Assuming that pension funds prefer high dividends; the fourth hypothesis questions whether the positive relationship exists between last year's pension funds ownership and this year's dividend payout. The fifth hypothesis questions a similar issue, i.e., whether firms increase their dividend payout following increase in pension fund ownership. The study run the regression analysis separately for Equation (3.1); Equation (3.2); and Equation (3.3) using different proxies of dividends: (1) dividend yield; and (2) dividend to book value to better understand the relationship between the variables in the study. The study also runs the regression analysis separately for Equation (3.10); and Equation (3.11) using different proxies of dividends including dividend per share, dividend to book value and dividend to earnings. The following chapter discusses the results of the study.

Chapter 4 : Findings on the Effect of Dividends on Pension Fund Ownership

4.1 Introduction

The previous chapter discusses the methodology adapted for the study. This chapter discusses the findings on the role of dividends in attracting pension funds as investors. Chapter Five discusses the findings on the role of pension funds in relation to a firm's dividend payout. The research findings are presented in this chapter and divided into three sections. The first section provides descriptive statistics for the study. The second section examines, using a simple t-test, whether the level of pension fund ownership is significantly higher for: (1) dividend-paying firms; (2) high dividend yield firms; and (3) stable increases in dividend. The third section discusses the regression analysis to examine whether a positive association exists between last year's dividends and this year's pension fund ownership. The study firstly discusses the analysis using full sample of firms, considering both prior and post 1997 tax changes. The removal of the tax credit after July 1997 reduced the value of dividends to pension funds as they were no longer able to reclaim the tax credit. Unfortunately, ownership data is only available for a short period prior to this change, but the study considers it useful to examine whether the change in taxation impacted pension fund ownership. The study acknowledged that the limited time period means the results cannot be generalised. Secondly, ignoring the issue of tax effects, the study repeats the analysis, excluding the period prior 1997 tax changes. Thirdly, the study discusses the regression analysis to examine whether pension funds increase their investments following an increase in dividend payout. The result is discussed based on the analysis on the following sub-sample firms: (1) full sample firms with pension fund ownership; and (2) dividend paying firms with pension fund ownership. The rationale of repeating the analysis using different sample firms is to enable the study to further understand the nature of pension fund ownership within specific groups. This also allows for comparison with the result of the t-test and non-parametric test discussed in the study. The last section summarises and concludes the results presented in Chapter Four.

4.2 Sample Description and Sample Statistics

This section presents the descriptive statistics for the sample of non-financial firms listed on the London Stock Exchange for the period of March 1997 to December 2008. The first part of this section provides the bar charts to summarise the sample distribution used in this study. The second part provides details of the sample selection for each of the years during the period of analysis. The study then divides firms into two different periods prior to July 1997 referred to as "prior 1997" and the period after July 1997 referred to as "post 1997". As mentioned in the previous chapter, the inclusion of the March 1997 data is important in order to compare the differences between the periods before and after the tax change[121]. A chi-square (X^2) statistic is conducted and discussed to investigate whether a significantly higher percentage of dividend paying firms having pension funds as investors[122].

The sample firms are classified into five groups: dividend paying firms; non-dividend paying firms; firm with pension fund ownership; firms without pension fund ownership and all samples. Bar charts are used to summarise the sample distribution for these five groups and also for the period prior 1997 and post 1997. The following Figure 4.1 and Table 4.1 shows that the number of firms varies throughout the year due to the use of unbalanced data selection as the study uses only those firms for which all the data is available. The first chart[123] shows that the majority of the firms in the study sample are the dividend paying firms. The percentage of dividend paying firms to total firms reduces with time. March 1997 appears to have the highest percentage of dividend paying firms at 89% whereas 2008 has the lowest with 60% of firms paying dividends. The second chart[124] shows the distribution ratio for firms with and without pension funds; surprisingly, the period with the highest percentage of firms without pension fund ownership is March 1997, where 68% of firms do not have pension funds as investors.

[121] As mentioned in Chapter Three, the March 1997 data are included since this was the last period available to capture an important change in taxation. The abolition of repayable dividend tax credits to tax-exempt pension funds became effective in the July 1997 Budget and from that date onwards, tax-exempt institutions could not reclaim the tax credit payable on dividend income.

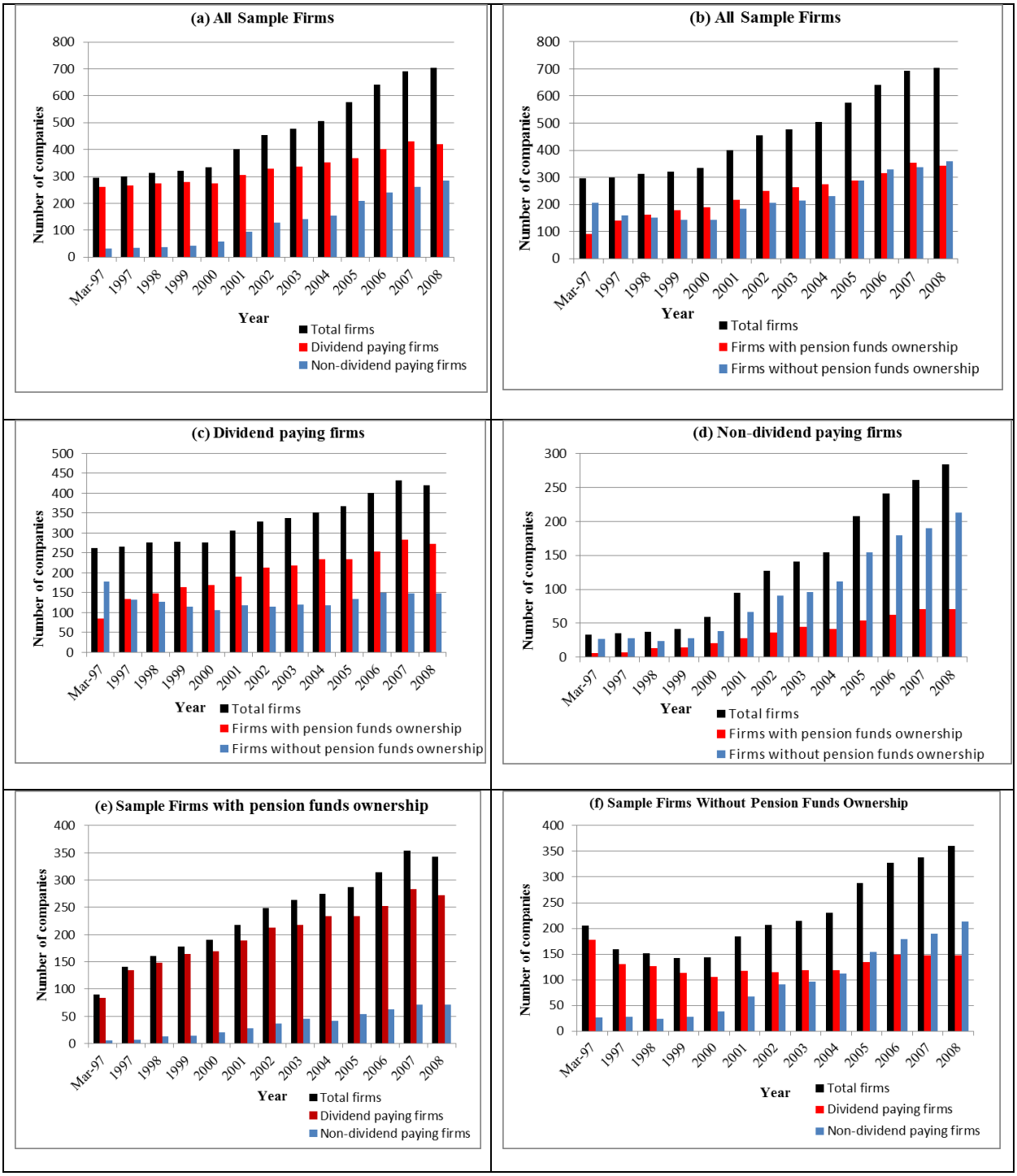
[122] According to Zikmund (2003), the chi-square statistics is a test that statistically determines significances in analysis of the frequency distributions and it allows the study to test for differences in two groups' distributions across categories.

[123] Chart (a).

[124] Chart (b).

To further understand the characteristics of the sample firms, both dividend and non-dividend paying firms are further divided into firms with and without pension fund ownership. The bar charts (c) and (d) summarise the distribution sample for firms with and without pension fund ownership, respectively based on the sub-samples of dividend and non-dividend paying firms. Generally, dividend paying firms, tend to comprise more firms with pension fund ownership than without, except for March 1997. In contrast, the non-dividend paying sample tends to comprise more firms that do not have pension funds as owners. Bar charts (e) and (f) summarise the sample distribution based on firms with and without pension fund ownership groups. Both groups are now further divided into dividend and non-dividend paying firms. The firms with pension fund ownership comprise more firms that pay dividends than firms that do not. The pattern is quite similar for the group of firms without pension fund ownership except for the period after 2005 where more firms in this group pay no dividends.

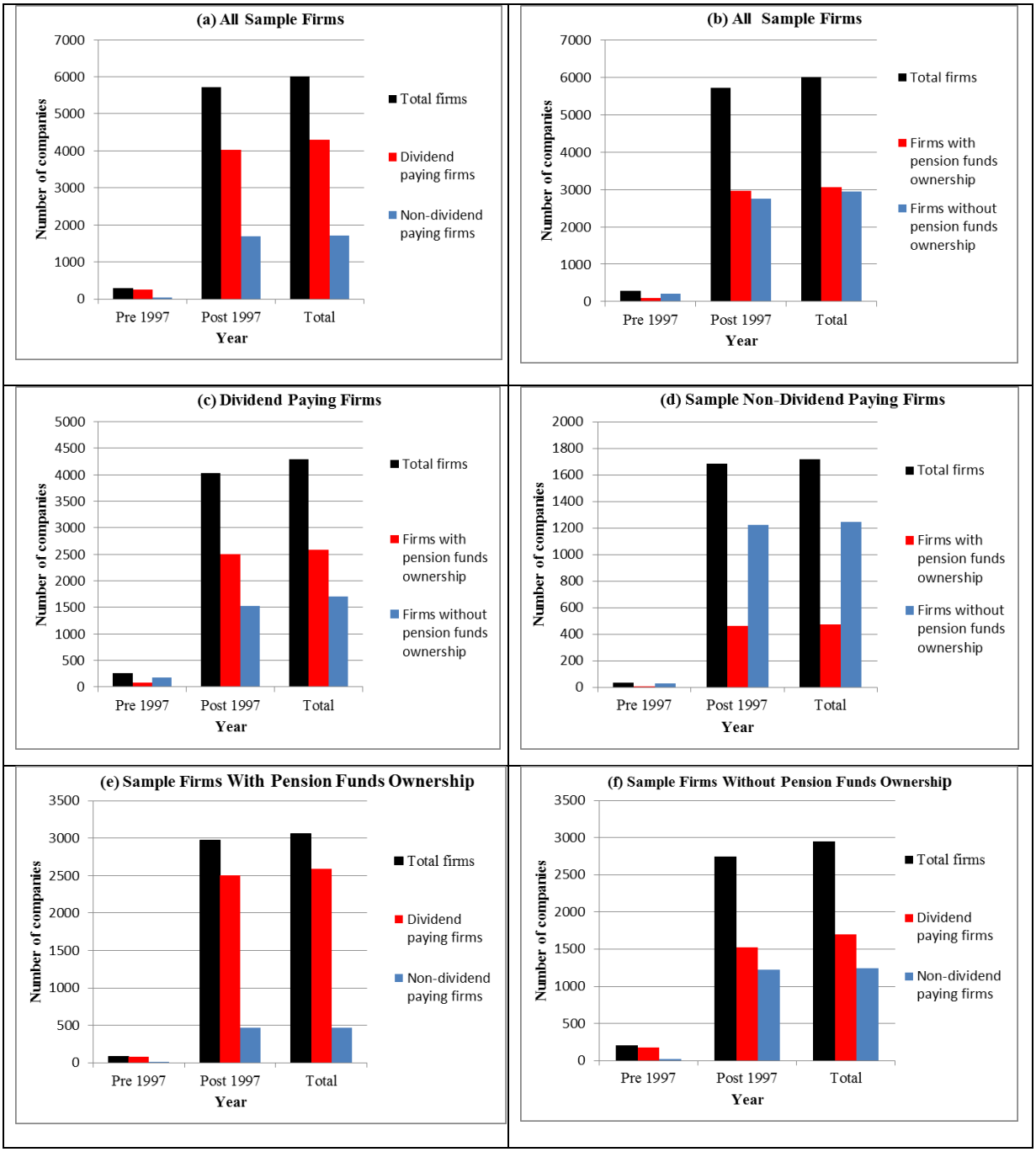
Figure 4.1: Sample distribution



Whilst the above bar charts display the sample based on all sample firms and year-by-year analysis, the next bar charts (Figure 4.2) present the sample distribution according to the period prior to and post 1997. March 1997 is the only year representing the period prior to the 1997 tax changes. The rest of the firm years are considered as post 1997 period.

Obviously, both periods comprise firms that pay dividends. For post 1997, the bar chart shows strong evidence that pension funds tend to invest in dividend paying firms (Chart (c)). Conversely, for the sample of non-dividend paying firms (Chart (d)) more than half of the firms do not have pension fund investors.

Figure 4.2: Sample distribution for period prior 1997 and post 1997



The previous discussion provides a pictorial representation of the sample distribution across the years 1997 to 2008. The next section discusses the result of the test examining whether firms with and without pension fund ownership are equally distributed among dividend paying and non-dividend paying firms. To further investigates whether distributions of categorical variables dividend paying firms and non-dividend paying firm are different from one another, the study provides a chi-square (X^2) statistic. As stated earlier, the chi-square statistic is a test that statistically determines significances in analysis of the frequency distributions and it allows the study to test for differences in two groups' distributions across categories. Thus, the chi-square test is used to examine whether there is a difference between the percentage of firms with pension ownership and firms without pension fund ownership depending on whether the firm pays dividends. The results are reported on a year-by-year basis.

As expected from the bar charts, the null hypothesis of equal distribution is rejected at the 1% level (chi-square test with one degree of freedom (df=1) and has a critical value of more than 3.841 at a 5% level of significance) for all years except 1997[125]. Hence, there is evidence that pension funds invest in dividend paying firms rather than non-dividend paying firms. The null hypothesis for 1998 is only rejected at the 10% level.

[125] In this case, according to Zikmund (2003, page 512), " it is necessary to compare the computed chi-square value with the critical chi-square values associated with the 0.05 probability level with one degree of freedom". In Appendix 2, the critical chi-square value is 3.84. Since the calculated chi-square is larger than the tabular chi-square, the null hypothesis (firms with and without pension funds ownership should be equally distributed among dividend paying firms and non-dividend paying firms) is rejected.

Table 4.1: Sample firms according to dividend payment status: Year by year analysis

Ho: Pension fund ownership is equally distributed between dividend and non-dividend paying companies

Year	Categories	Dividend paying firms		Non- dividend paying firms		Total		
		No	%	No	%	No	%	
2008	with pension fund	272	64.92	71	25.00	343	48.79	
	without pension fund	147	35.08	213	75.00	360	51.21	
	Total	419	59.60	284	40.40	703	100	107.94***
2007	with pension fund	283	65.66	71	27.20	354	51.16	
	without pension fund	148	34.34	190	72.80	338	48.84	
	Total	431	62.28	261	37.72	692	100	96.22***
2006	with pension fund	252	62.84	62	25.73	314	48.91	
	without pension fund	149	37.16	179	74.27	328	51.09	
	Total	401	62.46	241	37.54	642	100	82.99***
2005	with pension fund	233	63.49	54	25.96	287	49.91	
	without pension fund	134	36.51	154	74.04	288	50.09	
	Total	367	63.83	208	36.17	575	100	74.78***
2004	with pension fund	233	66.38	42	27.27	275	54.46	
	without pension fund	118	33.62	112	72.73	230	45.54	
	Total	351	69.50	154	30.50	505	100	66.01***
2003	with pension fund	218	64.69	45	31.91	263	55.02	
	without pension fund	119	35.31	96	68.09	215	44.98	
	Total	337	70.50	141	29.50	478	100	43.14***
2002	with pension fund	213	64.94	36	28.35	249	54.73	
	without pension fund	115	35.06	91	71.65	206	45.27	
	Total	328	72.09	127	27.91	455	100	49.48***
2001	with pension fund	189	61.76	28	29.47	217	54.11	
	without pension fund	117	38.24	67	70.53	184	45.89	
	Total	306	76.31	95	23.69	401	100	30.44***
2000	with pension fund	169	61.45	21	35.59	190	56.89	
	without pension fund	106	38.55	38	64.41	144	43.11	
	Total	275	82.34	59	17.66	334	100	13.25***
1999	with pension fund	164	58.99	14	33.33	178	55.63	
	without pension fund	114	41.01	28	66.67	142	44.38	
	Total	278	86.88	42	13.13	320	100	9.73***
1998	with pension fund	148	53.82	13	35.14	161	51.60	
	without pension fund	127	46.18	24	64.86	151	48.40	
	Total	275	88.14	37	11.86	312	100	4.56*
1997	with pension fund	134	50.57	7	20.00	141	47.00	
	without pension fund	131	49.43	28	80.00	159	53.00	
	Total	265	88.33	35	11.67	300	100	11.60***
Mar-97	with pension fund	84	32.06	6	18.18	90	30.51	
	without pension fund	178	67.94	27	81.82	205	69.49	
	Total	262	88.81	33	11.19	295	100	2.66
Total	with pension fund	2592	60.35	470	27.37	3062	50.93	
	without pension fund	1703	39.65	1247	72.63	2950	49.07	
	Total	4295	71.44	1717	28.56	6012	100	533.73***

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

The previous section discusses the year-by-year chi-square analysis. The following Table 4.2 reports the chi-square test for the distribution sample prior 1997 and post 1997[126]. The null hypothesis for the chi-square test proposes that firms with and without pension fund ownership, should be equally distributed among dividend paying and non-dividend paying firms. The result shows that the value of the chi-square test with one degrees of freedom (df=1) for the period post 1997 is more than 3.841 (p=0.05)[127]; this suggests that the null hypothesis is again rejected.

Table 4.2: Sample firms according to dividend paying status: Prior vs post 1997

This table reports the number of sample firms selected for UK non-financial firms listed on London Stock Exchange for period prior 1997 and post 1997. The sample firms are divided into two groups that are dividend paying firms and non-dividend paying firms and for each individual group, it further divided into firms with and without pension fund ownership. This table provides a chi-square (X^2) test that tests the null hypothesis as follows:

Ho: The firm with and without pension fund ownership should be equally distributed among dividend paying and non-dividend paying firms

Year	Categories	Dividend paying firms		Non- dividend paying firms		Total		
		No.	%	No.	%	No.	%	
Post 1997	with pension fund	2508	62.19	464	27.55	2972	51.99	
	without pension fund	1525	37.81	1220	72.45	2745	48.01	
	Total	4033	70.54	1684	29.46	5717	100	570.87***
Prior 1997	with pension fund	84	32.06	6	18.18	90	30.51	
	without pension fund	178	67.94	27	81.82	205	69.49	
	Total	262	88.81	33	11.19	295	100	2.66
Total	with pension fund	2592	60.35	470	27.37	3062	50.93	
	without pension fund	1703	39.65	1247	72.63	2950	49.07	
	Total	4295	71.44	1717	28.56	6012	100	533.73***

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

[126] The study divides firms into two different periods, i.e. period before July 1997 (prior 1997) and the period after July 1997 (post 1997). The inclusion of the March 1997 data is important in order to compare the differences between the periods before and after the tax change.

[127] In this case, according to Zikmund (2003, page 512), " it is necessary to compare the computed chi-square value with the critical chi-square values associated with the 0.05 probability level with 1 degree of freedom". In the Appendix 2, the critical chi-square value is 3.84. Since the calculated chi-square is larger than the tabular chi-square, the null hypothesis (The firm with and without pension funds ownership should be equally distributed among dividend paying firm and non-dividend paying firms) is rejected.

The next section highlights the sample firms' characteristics including mean, median, standard deviation, and minimum and maximum values for a number of variables.

4.2.1 Sample Characteristics

All continuous measures such as mean, median, standard deviation, and minimum and maximum values are analysed to describe the characteristic of the sample. Table 4.3 shows the descriptive statistics for the continuous variables utilised in this study. Of the sample of 6,012 observations, the mean for pension fund ownership is 0.9% with minimum and maximum values of zero and 7.1% respectively. The majority of the firms (66%) in the sample have pension fund ownership of less than 0.9%. The mean for dividend yield is 2.6 with minimum and maximum values of 0 and 34 respectively. There are more firms (55%) with a dividend yield of less than the mean (2.6) compared to firms with a greater than the mean dividend yield. In a similar vein, there are more firms (55%) with a lower than the mean for past year dividends. The mean value for size, proxied by market capitalisation[128], is £1,486 million, with minimum and maximum values of £0.112 million and £213,749 million, respectively. The spread of firms by size is skewed however, with the majority of the firms (88%) are less than the mean market capitalisation value. The current study uses log market capital to normalise the size variable. Other variables which are also skewed are growth (market to book ratio), risk (standard deviation) and leverage (debt to equity) with 67%, 61% and 67% of companies being less than the mean, respectively.

[128] Current study uses log market capital in the model.

Table 4.3: Summary of mean, standard deviation, minimum and maximum value

This table provide summary for the mean, standard deviation, minimum and maximum value of variables used in the study.

	Total sample	Mean	Standard deviation	Min	Max	% firms (≤mean)	% firms (>mean)
Ownership	6012	0.927	1.327	0.000	7.140	34.15	65.85
Past year dividend	5717	0.970	1.447	0.000	13.770	44.82	55.18
Dividend yield	6012	2.558	2.473	0.000	34.483	45.39	54.61
Size	6012	1486.375	7357.865	0.112	213749.3	12.33	87.67
Growth	6012	2.547	12.341	-356.272	352.679	32.96	67.04
Risk	6012	11.704	15.698	-49.223	196.023	38.67	61.33
Leverage	6012	51.689	256.547	-5294.118	5275.472	32.67	67.33
Abnormal return	6012	0.044	0.541	-1.330	5.617	41.92	58.08

To examine whether pension funds prefer: (1) dividend paying firms to non-dividend paying firms; (2) high-dividend firms to low-dividend firms; and (3) stable increases in dividend firms to non-stable increases dividend firms, the next section discusses the tests for differences between the groups.

4.3 Test for Differences Among Firms Based on Dividend Group

4.3.1 Introduction

This section uses both parametric and nonparametric tests to examine whether UK pension funds invest more in: (1) dividend paying firms; (2) high dividend paying firms; and (3) stable increases in dividend paying firms. First, a t-test with an assumption of normal distribution is performed to examine the differences in means for the respective groups. Second, a non-parametric test, which does not require the normality assumption, is conducted to investigate the sensitivity of the findings.

4.3.2 Test for Differences Between Dividend Paying Firms and Non-Dividend Paying Firms

The first hypothesis, stated in alternative form, examines whether there is a positive relationship between last year's dividend payout and this year's pension fund ownership. In short, Hypothesis 1 questions whether pension funds are attracted to firms with high dividend payout. The second hypothesis tests whether pension funds increase their investment following increase in dividend payout. The third hypothesis questions whether pension funds are attracted to firms with stable increase in dividend policy. The next section further discusses the test for that hypothesis. This section however, commences with a discussion for testing whether pension funds are likely to invest in firms that pay: (1) dividends; (2) high dividends; and (3) stable increases in dividend, regardless whether the high dividends are in place prior or subsequent to investment.

This section firstly discusses the result for the t-tests[129], comparing means of the pension fund ownership variable for the sub-samples of dividend paying and non-dividend paying firms. Dividend paying firms are separated from the non-dividend paying firms, with the dividend paying firms coded as 1 and the non-dividend paying firms as 0. The study uses unbalanced data and this type of data does not cause any problems with a t-test[130]. To test the mean difference between two independent samples, three assumptions should be checked. Generally, the t-test is not valid if any one of these assumptions is violated. The first assumption is that the samples are drawn from normally distributed populations with unknown parameters. The second assumption is that that the two samples are independent in the sense that they are drawn from different populations and/or the elements of one sample are not related to those of the other sample. The third assumption is that the population variances of the two groups are equal.

To test for the first assumption, the study uses the Shapiro-Francia[131] for normality test. The p value for ownership is at $p<.05$, thus suggesting the null hypothesis of normality is rejected. However, according to the Central Limit Theorem, as a sample size increases, the

[129] According to Zikmund (2003) the t-test is a technique used to test the hypothesis that the mean scores on some interval scaled variable are significantly different for two independent samples or groups.
[130] Source from www.indiana.edu/~statmath/stat/all/ttest/ttest1.html.
[131] In statistics, the Shapiro–Francia test tests the null hypothesis that a sample x_1, ..., x_n come from a normally distributed population. The statistic was developed by Shapiro and Francia (1972) and Royston (1983) and the recommended sample sizes for the Shapiro-Francia test range from 5 to 5,000.

distribution of sample means of size n, randomly selected, approaches a normal distribution (Zikmund 2003). Therefore, the study assumes that whilst the tests suggest the normality assumption is violated (p>.05) as the study uses a large sample of data the violation is noted but no further action is taken[132]. The study assumes that the second assumption is also not violated as the elements of one sample are not related to those of the other sample. The third assumption however, must be checked using the F test to examine whether the two populations have the same variance. Equal variance across samples is called homogeneity of variances. Some statistical tests, for example, the analysis of variance, assume that variances are equal across groups or samples. The current study uses the Bartlett's test[133] to verify the third assumption. The results are presented in Table 4.4 and show that the chi-square test statistic is significant at p<.05, thus the null hypothesis is rejected, suggesting that the samples do not have an equal variance. Since the assumption of equal variances is violated, then the next step is to compute the adjusted t statistic using individual sample standard deviations rather than a pooled standard deviation using Satterthwaite's approximations of the degrees of freedom[134]. It is also necessary to use the Cochran-Cox (SAS), or Welch (STATA) approximations of the degrees of freedom.

Table 4.4: Test for equal variance (dividend and non-dividend paying firms)

This table reports the Bartlett's test for equal variance for dividend paying firms and non-dividend paying firms.

Ho: The sample has equal variances

Sources	SS	Df	MS	F	Prob>F
Between groups	680.355	1	680.356	412.83	0.000
Within groups	9904.718	6010	1.648		
Total	10585.073	6011	1.761		
Bartlett's test for equal variance: Chi2(1) =347.04					Prob>chi2=0.000

[132] Kleinbaum et al. (2008), page 15, state that whenever sample size (n) is moderately large, sample means has approximately a normal distribution, regardless of the distribution of the underlying variable.

[133] As suggested by Snedecor and Cochran (1983), Bartlett's test is used to test if *k* samples are from populations with equal variances. Some statistical tests, for example, the analysis of variance, assume that variances are equal across groups or samples. Therefore, the Bartlett's test can be used to verify that assumption. Bartlett's test is sensitive to departures from normality, i.e., if the samples come from non-normal distributions, then Bartlett's test may simply be testing for non-normality. The Levene test and Brown–Forsythe test are alternatives to the Bartlett's test that are less sensitive to departures from normality.

[134] Satterthwaite's approximation of the degree of freedom is commonly used.

As mentioned earlier, this section discusses whether pension funds are likely to invest in firms that pay dividends. After checking for the validity of the assumptions discussed earlier, the current study now proceeds, using an unequal variance of the t-test, to examine whether the mean pension fund ownership is similar for dividend paying and non-dividend paying firms. Table 4.5 shows that there is a significant difference between the sub-samples of dividend paying and non dividend-paying firms at $p < .05$, thus the null hypothesis of no difference is rejected. The result suggests that dividend paying firms and non-dividend paying firms significantly differ in their ratio of pension fund ownership. The mean pension funds holding (1.14%) for the dividend paying sub-sample is significantly higher than the non-dividend paying sub-sample (0.4%). Consequently, the results suggest that pension funds are likely to invest in firms that pay dividends. The result is in line with a previous study by Greinstein and Michaely (2005) which suggests that pension funds in the US are more likely to invest in firms which pay dividends. However, their result is based on non-parametric test. The following section discusses the non-parametric test which does not require the normality assumption to investigate the sensitivity of the findings.

Table 4.5: Unequal variance t-test (dividend and non-dividend paying firms)

This table reports the test for a difference in group mean pension fund ownership for the dividend and non-dividend paying sub-samples using an unequal variance t-test.

Ho: There is no difference for mean pension funds holding between dividend paying and non-dividend paying

Group	Observation	Mean pension funds holding	Standard Error	Standard Deviation
Non-dividend paying firms	1717	0.395	0.023	0.936
Dividend paying firms	4295	1.140	0.021	1.399
Combined	6012	0.927	0.017	1.327
Diff		-0.745	0.031	
Satterthwaite's the degree of freedom =4661.57 t = -23.963 P=0.000[135]				

[135] This is the two-tailed p-value in which the probability of observing a greater absolute value of t under the null hypothesis. If the p-value is less than the pre-specified alpha level (usually .05 or .01) the study will conclude that mean difference between Non-dividend paying firm and Dividend paying firms is statistically significantly different from zero. Since the p-value for the difference between the group is lower than 0.05 so the study concludes that the mean difference is statistically significantly different from 0.

The study repeats the test of no difference in mean pension fund ownership using a non-parametric test. Non-parametric analysis does not require the dependent variable to be normally distributed. The current study uses Wilcoxon-Mann-Whitney analysis to conduct the non-parametric test and the result is reported in Table 4.6. The result shows that there is a statistically significant difference between the underlying distributions of the pension fund ownership ratio for the non-dividend paying firms and the dividend paying firms sub-samples ($z = -23.614$, $p = 0.000$). To determine which group has the higher rank, the study compares the actual rank sums to the expected rank sums. The result shows that the actual rank sums for the dividend paying group (14,260,894) are higher compared to the non-dividend paying group (3,814,184). Thus, the results suggest that dividend paying firms and non-dividend paying firms significantly differ in their ratio of pension fund ownership, suggesting the dividend paying group has a higher percentage of pension fund ownership than non-dividend paying firms.

Table 4.6: Non parametric test (dividend and non-dividend paying firms)

This table provides the results for the nonparametric test using Wilcoxon rank sum Man-Whitney test for the dividend and non-dividend paying firms sub-samples.

Ho: There is no difference between the underlying distribution of the ownership of dividend paying and non-dividend paying firms

Group	Observation	Rank sum	Expected
Non-dividend paying firms	1717	3,814,184	5,162,161
Dividend paying firms	4295	14,260,894	12,912,918
Combined	6012	18,075,078	18,075,078
Z	-23.614		
P	0.000		

In conclusion, the results of non-parametric test are consistent with the t-test result reported earlier suggesting that pension funds prefer dividend-paying firms to non-dividend paying firms. The results also support the findingss reported by Grinstein and Michaely (2005) in the US market where they provide evidence that institutions prefer dividend-paying firms to non-dividend paying firms. Jun, Gallagher and Partington (2011) also provide similar

evidence in the Australian market where their findings suggest institutional funds prefer stocks that pay dividends. In short, the results suggest that pension funds tend to invest in firms which pay dividends. As mentioned earlier, a few reasons may explain pension funds preferring dividend paying firms, such as dividend signalling, prudent investment (to satisfy the standards of fiduciary responsibility) and the need for stability of cash to support their liabilities.

Whilst the above analysis suggests pension funds prefer to invest in firms that pay dividends rather than in those that do not, the following section examines whether pension funds prefer to invest in firms that pay high-dividends.

4.3.3 Test for Differences Between High-Dividend Paying Firms and Low-Dividend Paying Firms

This section discusses the next analysis to examine whether pension funds prefer high-dividend paying firms to low-dividend paying firms. The study uses parametric and non-parametric analysis based on the sample of firms which pay dividends. The firms are now divided into low and high-dividend firms. Firstly, a t-test is performed to examine whether firms that belong to the high-dividend group have higher institutional holdings than firms belonging to the low-dividend group. The same steps are conducted and discussed as before and then a t-test is conducted. The three assumptions related to using the t-test are first checked. The definition of a high-dividend firm is one which has a dividend yield greater than the median and the rest are categorised as low-dividend firms. The study does not use the mean of dividends since the sample mean is sensitive to extreme values.

As mentioned earlier, the t-test is not valid if any one of the three assumptions is violated[136]. The first assumption is normality and the study relies on the Central Limit Theorem that suggests a large sample of data should approach normality[137]. The study also assumes that the two samples are independent in the sense that they are drawn from different populations and/or the elements of one sample are not related to those of the other sample.

[136] Generally, the t-test is not valid if any one of these assumptions is violated. The first assumption is that the samples are drawn from normally distributed populations with unknown parameters. The second assumption is that that the two samples are independent in the sense that they are drawn from different populations and/or the elements of one sample are not related to those of the other sample. The third assumption is that the population variances of the two groups are equal.

[137] The Central Limit Theorem says that when the sample is large, in practice, there is no need to worry too much about the normality assumption.

The next step is to determine whether the variance for the samples selected is equal across high and low-dividend paying firms using the Bartlett's test for equal variance. The results of the Bartlett's test are presented in Table 4.7. The result shows that the Bartlett's chi-square statistic cannot reject the null hypothesis of equal variance at 0.05 levels. Therefore it is appropriate to use the equal option for the t-test, which calculates Saatterthwaite's approximation of degrees of freedom.

Table 4.7: Test for equal variance (high and low-dividend paying firms)

This table reports the Bartlett's test for equal variance for high dividend yield and low dividend yield firms.

Sources	SS	Df	MS	F	Prob>F
Between groups	12.814	1	12.814	6.56	0.011
Within groups	8387.916	4293	1.954		
Total	8400.730	4294	1.956		
Bartlett's test for equal variance: Chi2(1)	0.0027				
P	0.958				

As discussed earlier, the treatment for taxing dividends changed in the UK in 1997. Prior to the change, tax-exempt investors, including pension funds, were not liable to pay either income tax or capital gains tax, but were allowed the repayment of the imputation credit. Bell and Jenkinson (2002) suggest that dividends were preferred by many classes of investors (including pension funds) before the Financial Act, 1997. However, after July 1997, the attractiveness of dividends reduced as the government changed the policy, such that tax credits paid on dividends were abolished. Following the change in taxation rules, one might argue that the dividends should no longer attract pension funds investment. However, due to dividend signalling theory and the prudent man concept, the current study expects pension funds to continue to invest in high-dividend paying firms.

Table 4.8 summarises the results for equal variance t-test where the high-dividend group appears to have lower levels of pension fund ownership (1.0857%) than the low-dividend group (1.195%). The null hypothesis of equal pension fund ownership is rejected at the 5% level of confidence. The result shows that there is significant difference in pension fund ownership between high and low-dividend paying firms. This initial finding suggests that pension funds are not necessarily attracted to high-dividend paying firms. The results are

also in a similar direction to those reported for the US market (Greinstein, 2005) and the Australian market (Jun et al., 2011). Based on the US market, Greinstein (2005) finds evidence that institutions prefer dividend-paying firms to non-dividend paying firms but they do not necessarily require the dividend payout to be high. Jun et al. (2011) also provide similar evidence in the Australian market where they suggest that institutional funds prefer stocks that pay dividends and, among dividend-paying stocks, there is no simple preference for high dividend yields. The next section discusses the non-parametric analysis to test the same hypothesis.

Table 4.8: Unequal variance t-test (high and low-dividend paying firms)

This table reports the test for differences in mean pension fund ownership (mean) for low-dividend yield compared to high-dividend yield firms using the equal variance t-test.

Ho: There is no difference for mean pension funds holding between low-dividend paying firms and high-dividend paying firms

Group	Observation	Mean pension funds holding	Standard Error	Standard Deviation
Low-dividend firms	2148	1.195	0.030	1.397
High-dividend firms	2147	1.085	0.030	1.399
Combined	4295	1.140	0.021	1.399
Diff		0.109	0.043	

Satterthwaite's the degree of freedom = 4293
t = 2.5609
P=0.011[138]

Greinstein and Michaely (2005) also use a non-parametric test to examine whether institutional investors invest more in high-dividend paying firms. The results, as reported in Table 4.9, suggest that there is a statistically significant difference between the underlying distributions of the pension fund ownership ratio of low-dividend and the high-dividend paying firms (z = 4.152, p = 0.000). The test compares the actual rank sums to the expected rank sums. The low-dividend group rank sum is higher than expected. On the other hand, the rank sum for the high-dividend group ranks is lower than expected. Thus, the study

[138] This is the two-tailed p-value in which the probability of observing a greater absolute value of t under the null hypothesis. The p-value is less than the pre-specified alpha level (usually .05 or .01), hence the study concludes that mean difference between High-dividend paying firm and low-dividend paying firms is statistically significantly different from zero.

concludes that the low-dividend group has the higher rank of pension fund ownership compared to the high-dividend group. In short, this suggests that pension fund ownership is higher in the low-dividend group. The result is similar with the one reported by Greinstein and Michaely (2005) and the parametric tests that suggest institutions may prefer low-dividend to high-dividend stocks. The dividend signalling hypothesis purports that firms use dividends to provide information to investors. If pension fund investors rely on dividends for investment purposes, the effects would suggest a preference for high-dividend paying firms. However, the result does not support the dividend signalling theory. The result may be due to the impact of the abolition of tax credit given to pension funds for the post 1997 period which was expected to reduce the attractiveness of dividend payout for pension funds.

Table 4.9: Non-parametric test (high and low-dividend paying firms)

This table provide results for the non-parametric test using Wilcoxon-Mann-Whitney test.

Ho: The low-dividend paying firms and high-dividend paying firms were drawn from the same population

		Dividend	
Group	Observation	Rank sum	Expected
Low-dividend paying firms	2148	4,756,775	4,613,904
High-dividend paying firms	2147	4,468,885	4,611,756
Combined	4295	9,225,660	9,225,660
Z		3.631	
P		0.000	

4.3.4 Test for Differences Between Stable Increase in Dividend Paying Firms and Non-Stable Increase in Dividend Paying Firms

Previous analysis suggests that pension funds may prefer dividend paying firms than non-dividend paying firms but they do not prefer high-dividend paying firms. The study then questions whether pension funds prefer to invest in firms with stable increases in dividend policy. This section provides discussion on the analysis of whether pension funds prefer firms with stable increases in dividend than firms with non-stable increase in dividend using parametric and non-parametric tests. The definition of a firm with stable increase in dividends is one which has stable increases in dividend per share for five consecutive years. The same

steps are conducted and discussed as before and a t-test is conducted. The result shows that the Bartlett's chi-square statistic (Table 4.10) rejects the null hypothesis of equal variance at 0.05 levels. Therefore it is appropriate to use the unequal option for the t-test, which calculates Saatterthwaite's approximation of the degrees of freedom.

Table 4.10: Test for equal variance (stable and non-stable increases in dividend)

This table reports the Bartlett's test for equal variance for stable and non-stable dividend policy

Sources	SS	Df	MS	F	Prob>F
Between groups	963.543	1	963.543	601.87	0.000
Within groups	9621.530	6010	1.601		
Total	10,585.073	6011	1.761		
Bartlett's test for equal variance: Chi2(1)	130.95				
P	0.000				

After checking for the validity of the assumptions discussed earlier, the current study now proceeds using an unequal variance of the t-test to examine whether the mean pension fund ownership is similar for stable increases in dividend paying firms and non-stable increases in dividend paying firms. Table 4.11 shows that there is a significant difference between the groups at $p < .05$; thus the null hypothesis of no difference is rejected. The result suggests that stable and non-stable increases in dividend paying firms significantly differ in their ratio of pension fund ownership, where the mean pension funds holding (1.542%) for the stable increases in dividend paying sample is significantly higher than the non-stable stable increases in dividend paying sample (0.667%). Consequently, the initial finding suggests that pension funds are likely to invest in firms that follow stable increases in dividends. The result is in the same direction as the one reported by Del Guercio (1996) which suggests that the stability of dividends is proven to be an important indicator of prudent investment. From another perspective, if pension funds need cash to fund their liabilities, the decision to invest in firms with stable increases in dividend might help them to have stable cash in hand[139]. The next section discusses the non-parametric analysis to test the same hypothesis.

[139] Short et al. (2002) suggest institutions will prefer dividends as they need "predictable" cash flows on anon going basis to fund their activities.

Table 4.11: Unequal variance t-test (stable and non-stable increases in dividend)

This table reports the test for differences in mean pension fund ownership for stable increases and non-stable increase dividend firms using unequal variance t-test.

Ho: There is no difference for mean pension funds holding between stable and non-stable dividend firms.

Group	Observation	Mean pension funds holding	Standard Error	Standard Deviation
Non-stable increases in dividend firms	4222	0.667	0.018	1.171
Stable increases in dividend firms	1790	1.542	0.035	1.463
Combined	6012	0.927	0.017	1.327
Diff		-0.876	0.039	

Satterthwaite's the degree of freedom = 2805.84
t = -22.45
P=0.000[140]

The results for non-parametric test (Table 4.12) suggest that there is a statistically significant difference between the underlying distributions of the pension fund ownership ratio of non-stable increase in dividend and stable increase in dividend paying firms (z = -26.323, p = 0.000). The test compares the actual rank sums to the expected rank sums where the stable increases in dividend group rank sums is higher than expected. On the other hand, the rank sums for the non-stable increase in dividend group is lower than expected. Thus, the study may conclude that the stable increases in dividend paying firms has the higher rank of pension fund ownership compared to non-stable increase in dividend paying firms. In short, this suggests that pension fund ownership is higher in the stable increase in dividend paying firms. The dividend signalling hypothesis purports that firms use dividends to provide information to investors. If pension fund investors rely on the information provided by stable increase in dividend for their investment purposes, the effects would suggest a preference for stable increases in dividend policy firms.

[140] This is the two-tailed p-value in which the probability of observing a greater absolute value of t under the null hypothesis. The p-value is less than the pre-specified alpha level (usually .05 or .01), hence the study concludes that mean difference between High-dividend paying firm and low-dividend paying firms is statistically significantly different from zero.

Table 4.12: Non parametric test (stable and non-stable increases in dividend)

This table provide results for the non-parametric test using Wilcoxon-Mann-Whitney test.

Ho: The non-stable dividend paying firms and stable dividend paying firms were drawn from the same population

Group	Observation	Rank sum	Expected
Non-stable paying firms	4222	11,172,258	12,693,443
Stable dividend paying firms	1790	6,902,820.5	5,381,635
Combined	6012	18,075,078	18,075,078
Z		-26.323	
P		0.000	

4.3.5 Summary of the Findings

The first part of this section examines whether pension funds tend to invest in dividend paying firms. Both t-test and non-parametric test suggest that pension funds tend to invest in dividend paying firms. The second part determines whether pension funds are attracted to high-dividend paying firms. Both results suggest that there is a difference between low and high-dividend paying firms in relation to pension fund ownership. However, the high-dividend group appears to have lower levels of pension fund ownership than the low-dividend group. In short, the results suggest that pension funds prefer to invest in low-dividend paying firms. The last part of the section compares the stable increases in dividend paying firms and non-stable increases in dividend paying firms with relation to pension fund ownership. The result for both t-test and non-parametric test suggest that pension funds prefer stable increases in dividend paying firms than non-stable increases in dividend paying firms. The next section further discusses the relationship between the variables using regression analysis.

4.4 Effect of Dividends on Pension fund ownership

4.4.1 Introduction

The studies by Grinstein and Michaely (2005) in the US market; and by Jun et al. (2011) in the Australian market, suggest that institutional funds prefer stocks that pay dividends, and among dividend-paying stocks, there is no simple preference for high dividends. This section discusses the analysis carried out to further understand the relationship between the variables. The following section firstly discusses the underlying assumptions of regression analysis to better understand the nature of regression analysis. Secondly, the study discusses the analysis to examine the relationship between level of dividend and level of pension fund ownership. Thirdly, the study discusses the analysis on whether pension funds increase their investment following increase in dividend payout. The last section summarises the findings.

4.4.2 Assumption of Linear Regression Analysis

According to Kleinbum et al. (2008), there are five statistical assumptions for a multiple regression model; existence, independence, linearity, homoscedasticity and normality. The first assumption is existence, where for a specific combination of values of the independent variables X1, X2,…Xk, Y is a (univariate) random variable with a certain probability distribution having finite mean and variance.

The second assumption is independence where the Y observations are statistically independent of one another. In other words, the errors associated with one observation are not correlated with the errors of any other observation (autocorrelation). The assumption is appropriate in many, but not all situations. The violation of this assumption is when different observations are made on the same individual at different times. The problem of autocorrelation may exist in the current study due to observation of firms at different time periods. When Y values are not independent, special methods can be used to find the best-fitting model and to make valid statistical inferences. The current study runs and reports robust cluster standard errors analysis since the analysis can overcome both heteroskedasticity (violation of homoscedasticity) and autocorrelation problem.

The third assumption is linearity of the regression model, where the model in the current study specifies a linear relationship between Y and X1….Xk. In simple words, it is when a relationship between the predictors and the outcome variable is linear.

The fourth assumption is homoscedasticity in which the variance of Y is the same for any fixed combination of X1, X2, …Xk. Heteroskedasticity is an example of violation of this assumption, where the distribution of Y at X1 has considerably more spread than the distribution of Y at X2. Basically, mild departures do not have significant adverse effects on the results. Therefore, the problems of heteroskedasticity, need to be considered only when the data shows very obvious and significant departures from homogeneity. The current study, uses robust cluster analysis to cater for both heteroskedasticity and autocorrelation problem. Stata includes this option referred to as Huber/White estimator or sandwich estimators of variance. According to Baum (2008), when heteroskedasticity is present, robust standard errors tend to be more trustworthy. Robust cluster standard errors estimator has the same form of Newey-West test to control for both heteroskedasticity and autocorrelation. Therefore, robust cluster estimator is used in the current study.

The last assumption is normal distribution, where for any fixed combination value of X1, X2, …Xk, the variable Y is normally distributed. If the normality assumption is not badly violated, the conclusions reached by a regression analysis in which normality is assumed will generally be reliable and accurate. According to Kleinbum et al. (2008), the normality assumption is not necessary for the least squares fitting of the regression model, but it is required in general for inference making.

In addition, there are questions that can arise during the analysis which is of great concern to data analysts although it is not formally stated as assumptions of regression. Green (2012) states that the omission of relevant variables is one of the specification errors that one might make in constructing the regression model. The current study tests for omitted variables since the test is important as it is assumed that the error term and the independent variables in the model are not correlated. Fixed effects model is to reduce the problem of omitted variable bias. The study also tests for the collinearity problem (multicollinearity). Multicollinearity refers to the predictors that are highly linearly related, thus causing problems in estimating the regression coefficients. Therefore, the study performs the test and discusses the existence of multicollinearity problem.

4.4.3 The Relationship Between Dividend Payout and Pension Fund Ownership

This section discusses the result of the first and the third hypotheses testing using an ownership model. The first hypothesis, stated in alternative form, examines whether a positive relationship exists between last year's dividend payout and this year's pension fund ownership; the third hypothesis, stated in alternative form, examines whether a positive relationship exists between stable increases in dividend and pension fund ownership. The study defines dividends as: (1) dividend yield; and (2) dividend to book value. The dividend yield depends on market price of the stock and therefore, out of management control; whereas the dividend to book value is not affected by the market price.

The dependent variable for the model Equation (3.1) and (3.2) is the level of pension fund ownership. As discussed earlier, linearity, among others, is the major assumption for linear regression analysis. The inclusion of firms without pension fund ownership (pension fund ownership = 0) in the model however, may violate the linearity assumption. The study therefore runs the analysis only for the sub-sample firms with pension fund ownership. Basically, Tobit analysis may overcome the problem since it is designed to improve estimates when there is either left or right censoring. In this case, left censoring occurs when the minimum value of the dependent variable (pension fund ownership) is equal to 0. However, the result provided by Tobit analysis is sensitive to assumption of homoscedasticity (Baum, 2008, page 266). The study therefore does not proceed with Tobit regression analysis as the robust standard errors are not available for that analysis. Alternatively, the study can use the log transformation of dependent variable. However, the study has to add some values to the original data (the log transformation cannot be done for zero (0) value), before the log transformation can be done. Thus, the study may face a problem in interpreting the results. The study therefore runs the analysis based on sub-sample firms with pension fund ownership in this model. In other words, the study limits the scope to this group only, and thus cannot be generalised.

The study firstly discusses the analysis of equation (3.1), using dividend yield as a proxy for dividend payout. Basically, the fixed effects panel data regression analysis model may not be the most efficient model to run because random effects will give better p-values as they are a more efficient estimator (Green, 2012). Therefore, the researcher may use random effects if it is statistically justifiable to do so. The generally accepted way of choosing between fixed and random effects is running a Hausman test. According to Green

(2012), the Hausman test is designed to detect violation of the random effects modelling assumption. The current study performs a Hausman test on panel data to determine whether to choose random effects or fixed effects model for the analysis. The Hausman test tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. If the p-value is insignificant (Prob>chi2 larger than 0.05) then it is safe to use random effects. The insignificant p-value (chi-square=12.65, p>.05) for the current study, however, suggests that the random fixed effects model should be used. The current study also runs the Breusch-Pagan Lagrange Multiplier test to tests whether to choose pool OLS or random effect model. The result from the analysis however reject the hypothesis (chi-square at 2608.79, p<.05) meaning that pooled OLS is not the appropriate model.

As discussed earlier the regression analysis relies on a few assumptions, including the assumption on homoscedasticity and independence. The study therefore reports the robust cluster result to overcome those problems[141]. The result of non-robust model is also reported for comparison purposes. The study also repeats the analysis for Equation (3.1) and (3.2) using "dividend paying firms with pension funds ownership" sub-sample to have a better understanding of pension funds investment practice. The study assumes that the decision to increase or to retain an investment might be different when a firm has already committed to its dividend policy. The test for normality using Shapiro Wilk test shows that the normality assumption is violated at (z=11.84, p<.05)[142]. However, no further action is taken since the study relies on the Central Limit Theorem that suggests a large sample of data should approach normality. The result on omitted variables based on Ramsey test shows that the null hypothesis of no omitted variables cannot be rejected at (F=2.15, p>.05), thus concluding that the model applied has no problem of omitted variables.

It is important to test the multicollinearity problem in regression to assume that the predictor variables are not correlated with each other. A situation in which two or more independent variables in a multiple regression model are highly linearly related is called multicollinearity. According to Baum (2006, p. 85), "if two variables are perfectly collinear, only one of those variables can be included in the model and the estimated coefficient is the sum of the two coefficients of the original variables". Accordingly, the problem arises for multivariate analysis if two explanatory variables are highly correlated with each other due to

[141] Robust cluster analysis is run in Stata 10 package. The Newey test is an alternative to robust cluster analysis.
[142] Refer to the graph of normality on Appendix 3.

the fact that both variables are explaining almost the same variability in the outcome. Collinearity or multicollinearity increases the standard errors of the coefficients and increased standard errors means that coefficients for some independent variables may be found not to be significantly different from 0, whereas without multicollinearity and with lower standard errors, these same coefficients might have been found to be significant. Therefore, one of a pair of highly correlated variables might be excluded before conducting multivariable analysis. Firstly, it is useful to test the correlation between explanatory variables looking for high pairwise correlations (near collinearity). This is not sufficient to conclude whether they pose problems. Therefore, the next step to follow is by referring to the variance inflation factor (VIF) to further discuss the multicollinearity problem. The problem is said to exist when the tolerance value (1/VIF) is less than 0.01, and VIF is more than 10 (Hair, et al. (2006); and Pallant, (2007)). The following paragraph further discusses both steps to detect multicollinearity problems.

According to Zikmund (2003), correlation analysis determines the extent to which changes in the value of an attribute are associated with changes in another attribute. In short, it defines the relationship between the two variables and the correlation coefficients can range from -1.00 to +1.00. A value of -1.00 represents a perfect negative association while a value of +1.00 represents a perfect positive association. A value of 0.00 represents a lack of association. If the correlation coefficient value moves towards 0, the relationship between the two variables is becoming weaker. Pallant (2007) describes two types of correlation analysis, i.e., Pearson correlation and Spearman Rho correlation. Pearson correlation analysis is used to investigate the relationship between two continuous[143] variables that are normally distributed. Spearman Rho correlation is a non-parametric[144] analysis that is used to investigate associations between dichotomous[145] variables.

[143] Continuous variable is a quantitative variable that is continuous or having no infinite number of attributes. The term "continuous" refers to numeric values that can be ordered sequentially.

[144] Non-parametric methods are most appropriate when the sample sizes are small. When the data set is large (e.g., n > 100), it often makes little sense to use non-parametric statistics. Elementary Concepts briefly discuss the idea of the central limit theorem. When the samples become very large, then the sample means will follow the normal distribution even if the respective variable is not normally distributed in the population, or is not measured very well.

[145] Dichotomous variable categorises data into two groups, such as high-dividend paying firms versus low-dividend paying firms, stable increases in dividend firms versus non-stable increases in dividend firms. It is also known as dummy variable.

Table 4.13 reports the correlation test for continuous variables[146]. Hair et al. (2006) argue that variables where the correlation coefficient is higher than 0.7 are considered highly correlated. The Table reports a medium correlation between growth and leverage (0.571), suggesting that the higher growth firms are more likely to have higher debt to equity. The growth firms may proceed for debt financing to fund their projects or activities, thus increasing their debt to equity. The result also exhibits a positive correlation of 0.277 between the risk variable and abnormal returns suggesting that firms with higher risk are more likely to have higher abnormal return. A positive correlation of 0.115 is identified between firm size and pension fund ownership variables suggesting pension funds are more likely to invest in large firms. The Table also exhibits lower correlations (between 0 and 3.0) for the other variables.

Table 4.13: Correlation test for variables in Equation (3.1)

This table provides summary for the result of correlation test for variables in Equation (3.1)

	Variables	1	2	3	4	5	6	7	8
1	Ownership	1							
2	Dividend	0.070	1						
3	Size	0.115	0.011	1					
4	Growth	-0.014	-0.044	0.053	1				
5	Risk	-0.084	-0.064	-0.063	0.004	1			
6	Leverage	-0.001	0.035	0.048	0.571	-0.008	1.000		
7	Abnormal return	-0.018	0.044	0.073	0.049	0.277	0.018	1	
8	Dividend X dummy before tax changes	0.095	0.048	0.025	0.010	-0.050	-0.001	-0.014	1

To further test the existence of multicollinearity problems, the study refer to tolerance value and VIF. The results as reported in Table 4.14 show that the tolerance value (1/VIF) for all variables is more than 0.01 and the VIF is less than 10. The study therefore assumes that there is no evidence of the existence of high multicollinearity between the independent variables. The current study is more concerned with the high correlation between growth (proxied by market to book value) and leverage (0.571). However, separate analysis is not

[146] For quantitative variables, correlation is tested by Pearson correlation coefficient and the association between a categorical and a continuous variable can be assessed by t-test.

conducted since the problem of multicollinearity is not detected in this study. The next part discusses the results of the regression analysis.

Table 4.14: Multicollinearity test for variables in Equation (3.1)

Variable	VIF	1/VIF
Last year's dividend	1.10	0.908
Size	1.02	0.982
Growth	1.50	0.667
Risk	1.11	0.899
Leverage	1.49	0.669
Abnormal return	1.10	0.909
Stable increases in dividend	1.10	0.907
Dividend X dummy before tax changes	1.01	0.995
Mean	1.18	

The following Table 4.15 reports the result of the study based on Equation (3.1) [147] using full sample including period prior to 1997 tax changes. This model excludes lag of pension fund ownership since the data is not available before March 1997. Even, with limited data due to the one year time period, the study still proceeds with the analysis to see the effect of the tax changes on dividends in relation to pension fund ownership. The first hypothesis (Hypothesis 1a), stated in alternative form, examines whether a positive relationship exists between last year's dividend payout and this year's pension fund ownership. Previous research, such as Hotchkiss and Lawrence (2003), suggest that pension funds need dividends because they are part of an institutions' investment style; they find that as dividends increase, a higher proportion of the stocks are held by those institutions. On the other hand, studies by Grinstein and Michaely (2005) for the US market and Jun et al. (2011) for the Australian market both suggest that institutional funds prefer stocks that pay dividends, but among dividend-paying stocks, there is no simple preference for high-dividend stocks. In line with the study by Greinstein and Michaely, the results for full sample period (prior and post1997) do not provide support of a positive relationship between the level of dividends a firm pays and pension fund ownership. This also refutes the evidence presented earlier in this study

[147] The current study uses random effects panel regression analysis for this sample as the result of Hausman test (chi-squares=12.65, p>.05) suggest that the null hypothesis of the difference in coefficient is not systematic cannot be rejected, thus random effect can be used for further analysis.

based on comparison of means for high and low dividend paying firms[148]. The study then repeats the analysis using "dividend paying firms with pension fund ownership" sub-sample. The study shows similar result suggesting that dividend payout is insignificantly related to pension fund ownership.

The unfavourable change in taxation for pension funds in July 1997 and subsequent studies, such as Bell and Jenkinson (2002), suggest the incentive for pension funds to invest in high-dividend paying companies should have been greater prior to July 1997 and hence the relationship between dividend and pension fund ownership was expected to be stronger in the period prior to the 1997 tax changes[149]. Based on sample firms with pension fund ownership, the analysis shows that a significantly positive coefficient is observed for dividend multiplied by dummy variable which takes the value of one (1) prior to July 1997. This suggests that pension funds prefer to invest in firms with higher dividends prior to July 1997. A similar result is reported when the study repeats the analysis using "dividend paying firms with pension fund ownership" sub-sample. However, the result cannot be generalised due to limited sample because the study uses a relatively small sample available before the 1997 tax changes. The positive relationship between dividend payout for period prior 1997 and pension fund ownership supports the dividend clientele hypothesis. In other words, the result implies that the higher the dividend in the period in which the tax credit is still applicable, the higher the pension fund ownership. Even though the result may support the tax effect (tax-clientele hypothesis); the result may also be influenced by other factors, including the prudent man charter.

The evidence strongly suggests that higher dividends might not be a reason to encourage pension funds to invest. However, the potential of signalling role of dividends in pension funds investment is still questionable. The result shows that a coefficient (0.353) for stable increases in dividend is significantly different from zero ($p<.05$), suggesting a positive relationship between the stable increases in dividend and pension fund ownership. As discussed earlier, the current study defines stable increases in dividend as an increasing of firm's dividends per share (adjusted for stock splits, for example) for the last five years. The significantly positive relationship between the variable suggests that firms which increase dividend for the last five years may attract pension funds investment. Del Guercio (1996)

[148] The t-test discussed earlier suggests that pension funds prefer dividend paying firms, but among dividend paying firms, they prefer firms with low levels of dividend payouts.
[149] Refer Bell and Jenkinson (2002) and Hodgkinson (2002).

argues that dividend does not play a major role in portfolio choice. However, he suggests that the prudent-man rule does play an important role. Since the stability of dividend is proven to be an important indicator of prudent investment, thus it is considered an important factor in the institutional investor's portfolio selection. In line with that, the current study suggests that the stable increase in dividend may influence pension funds investment practice. Allen et al. (2000) suggest among others, one motive for making dividend payments is to attract institutional investor and one of the reasons why institutions invest in firms that pay higher dividends is that they are less likely to be sued by investors if their portfolios consist of that type of firm, since the court considers these firms more prudent investments. Therefore, the possible explanation for why pension funds in the UK look for stable increase in dividend firms might be due to prudent investment.

Another possible explanation might be related to the issue as discussed by Short et al. (2002). They suggest institutions prefer dividends as they need 'predictable' cash flows on anon going basis to fund their activities. They initially invest in equities in order to provide returns to fund their activities, such as funding pensions, paying out on insurance policies and many others. It is reasonable for institutional investors, including pension funds in the UK, to invest in firms that follow stable increases in dividend in order to increase the likelihood of a stable cash flow stream to support and fund their liabilities. The UK pension funds, as discussed earlier in Chapter Two, might aim for investment income (dividends) to ensure that over the long-term, and after allowing for all future income, the scheme will have enough money to meet the costs of the payments to be made. As mentioned earlier, pension funds might need cash to fund their liabilities and therefore need stable cash in hand[150].

Del Guercio (1996); Lakonishok, et al. (1994); and Shefrin and Statman (1995) suggest that investment by institutional investors could be related to size. As mentioned earlier, pension funds have possibilities to invest in large firms since large firms refers to matured and established firms, and investing in such firms might be viewed as a prudent investment. However, the result shows that the size variable is not related to pension fund ownership for subsample firms with pension fund ownership. However, a significantly negative relationship is found when the study repeats the analysis using "dividend paying firms with pension fund ownership" sub-sample. The study therefore suggests that pension

[150] Short et al. (2002) suggest institutions will prefer dividends as they need "predictable" cash flows on an ongoing basis to fund their activities.

funds may have tendency to invest in small-sized firms if the firms are already committed for dividend payout.

The study reports weak evidence on the negative relationship between risk variable proxied by a standard deviation of return to pension fund ownership (coefficient=-0.003, $p<.05$), implying that pension funds might be keen to invest in lower risk firms, in line with the prudent investment concept. The other variables, including growth, risk and abnormal returns are not significantly related to pension fund ownership.

Table 4.15: The effect of last year's dividends yield on this year's pension fund ownership based on full sample firms (post 1997 and prior 1997)

This table reports the results of panel data regression analysis based on full sample firms (post 1997 + prior 1997)

$$Pfownit = \beta o + \beta 1\, Divi(t-1) + \beta 2 Sizeit + \beta 3 Growthit + \beta 4 Riskit + \beta 5 Levit + \beta 6 Abreturnit + \beta 7 Divstabit + \beta 8 Divi(t-1)X\, Dumbtxijt + e\, it \quad (4.1)$$

	Full sample firms with pension fund ownership		Sample dividend paying firms with pension fund ownership	
	Random effects coefficient (standard errors)	Random effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
Last year's dividend	0.013	0.013	-0.041	-0.041
	(0.011)	(0.016)	(0.015)	(0.022)
Size	-0.014	-0.014	-0.150*	-0.150**
	(0.021)	(0.026)	(0.039)	(0.063)
Growth	-0.001	-0.001	-0.001**	-0.001**
	(0.002)	(0.001)	(0.002)	(0.002)
Risk	-0.003**	-0.003**	-0.002**	-0.002**
	(0.001)	(0.001)	(0.002)	(0.002)
Leverage	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Abnormal return	0.011	0.011	0.062	0.062
	(0.038)	(0.038)	(0.049)	(0.056)
Stable increases in	0.353***	0.353***	0.340***	0.340***
dividend	(0.051)	(0.079)	(0.057)	(0.083)
Dividend X dummy	0.192***	0.192***	0.180***	0.180***
prior 1997	(0.034)	(0.037)	(0.035)	(0.034)
Constant	1.629***	1.629***	2.768***	2.768***
	(0.132)	(0.166)	(0.254)	(0.409)
F			10.630	6.24
Wald Chi-Square	92.41	51.29		
Number of observation	3062	3062	2597	2597
Sigma_u	1.007	1.007	1.156	1.156
Sigma_e	0.926	0.926	0.933	0.933
Rho	0.541	0.541	0.606	0.606
R2: within	0.0291	0.0291	0.0368	0.0368

	Full sample firms with pension fund ownership		Sample dividend paying firms with pension fund ownership	
	Random effects coefficient (standard errors)	Random effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
R2:between	0.0318	0.0318	0.0007	0.0007
R:overall	0.0353	0.0353	0.0001	0.0001

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

The study repeats the analysis ignoring the tax effect, thus excluding the 1997 tax changes period. The decision to exclude the period prior 1997 is due to the assumption that one year period is too short and not suitable for dividend policy and pension funds investment practices study. Both relate to time trends and are preferable for longer periods. Additionally, excluding the prior 1997 period allows the current study to introduce the lag dependent variable to reduce the problem of autocorrelation. Pension funds are generally considered as long-term investors; hence, the previous year pension fund ownership may influence the decision to reduce, retain or increase their investment. The study does not perform a proper test to introduce the lag dependent variable. However, Greinstein and Michaely (2005) suggest that one (1) year lag is enough to allow institutional investors to establish their investment practice.

Table 4.16 reports the result of the analysis for Equation (3.2) using post 1997 sample firms. By excluding prior1997 sample, and the including lag of pension fund ownership, the overall R2 much is higher when the prior 1997 period is excluded; as the R2 is a measure of fit the model fits significantly better on the reduced sample. The results from the analysis using the reduced sample are in line with the full sample except the level of risk is not significantly related to pension fund ownership. The study then repeats the analysis using "dividend paying firms with pension fund ownership" sub-sample. Contrary to previous result based on sub-sample pension fund ownership, the study finds weak evidence ($p<.1$) on the negative relationship between dividends and pension fund ownership, thus suggesting that the pension funds investors have the possibility of reducing their investment whenever there is an increase in dividend payout. The result is in line with Jain (2007) in his US study. He suggest that the institutional investors have a preference for low dividend yield stocks;

relative to high dividend yield stocks whereas individual investors have a preference for high dividend yield stocks relative to low dividend yield stocks. Greinstein and Michaely (2005) also suggest a negative relationship between dividends and institutional investors.

As discussed earlier in Chapter Two, Gombola and Liu (1993) examine the stability of dividends as a potential signalling tool as well as lower business risk indicator. Even though the study does not directly provide evidence that dividend stability influences institutional investment, it does highlight the importance of a stable pattern of dividend payments. The current study, however looks at the effect of stable increases in dividend and the result shows that a coefficient (0.244) for stable increases in dividend is significantly different from zero ($p<.01$), suggesting a positive relationship between the stable increases in dividend and pension fund ownership. The study therefore suggests that while dividend payout is not necessarily related to pension fund ownership, stable increases in dividend potentially influences pension fund investment practice. The following section discusses the result using dividend to book value as proxy for dividends.

Table 4.16: The effect of last year's dividends yield on this year's pension fund ownership based on sample firms for post 1997 period

This table reports the results of fixed effects panel data regression analysis based on sample firms for Post 1997 period

$$Pfownit = \beta o + \beta 1 Pfowni(t-1) + \beta 2\, Divi(t-1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\, it \quad (4.2)$$

	Full sample firms with pension fund ownership		Sample dividend paying firms with pension fund ownership	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
Last year's pension fund ownership	0.371*** (0.014)	0.371*** (0.030)	0.387*** (0.016)	0.387*** (0.030)
Last year's dividend	-0.001 (0.011)	-0.001 (0.014)	-0.032** (0.013)	-0.032* (0.017)
Size	-0.048* (0.029)	-0.048 (0.037)	-0.121*** (0.036)	-0.121*** (0.046)
Growth	0.002 (0.001)	0.002 (0.001)	0.003 (0.036)	0.003 (0.002)
Risk	-0.001 (0.001)	-0.001 (0.001)	-0.002 (0.002)	-0.002 (0.002)
Leverage	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)
Abnormal return	0.014 (0.035)	0.014 (0.032)	0.021 (0.000)	0.021 (0.044)
Stable increases in dividend	0.244*** (0.050)	0.244*** (0.062)	0.225*** (0.052)	0.225*** (0.060)
Constant	1.322*** (0.175)	1.322*** (0.233)	1.886*** (0.232)	1.886*** (0.303)
F	89.72	23.71	84.490	28.27
Number of observation	2972	2972	2513.000	2513.000
Sigma_u	0.795	0.795	0.772	0.772

	Full sample firms with pension fund ownership		Sample dividend paying firms with pension fund ownership	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
Sigma_e	0.820	0.820	0.819	0.819
Rho	0.485	0.485	0.470	0.470
R2: within	0.2210	0.2210	0.2399	0.2399
R2:between	0.5980	0.5980	0.6197	0.6197
R:overall	0.4950	0.4950	0.4536	0.4536

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

The analysis is repeated with the dividend to book value as a proxy for dividend payout. While dividend yield influenced is by the market price of the stock, dividend to book value is a more stable measure of dividends. The analysis is necessary to better understand the relationship between dividends and pension fund ownership. The study again runs the test discussed earlier to make sure the model adapted is preferable. The result of the Hausman test on the null hypothesis of the coefficients estimated by the efficient random effects estimator is the same as the ones estimated by the consistent fixed effects estimator, which is significant (Chi-Square=38.19, $p<0.05$) for the current study, suggesting that the fixed effects model should be used. The study uses robust cluster fixed effects panel data regression analysis to overcome the problem of heteroskedasticity and autocorrelation. However, the result of non-robust model is also reported for comparison purposes. The test for normality using Shapiro Wilk test shows that the normality assumption is violated at ($z=13.1$, $p<.05$)[151]. Again no further action is taken since the study relies on the Central Limit Theorem that suggests a large sample of data should approach normality. The result on omitted variable based on Ramsey test shows that the null hypothesis of no omitted variables is rejected at ($F=2.15$, $p>.05$), thus concluding that the model applied has a problem of omitted variables. However, the use of fixed effects model in the current study may reduce the problem of omitted variables. The study also reports that there is no multicollinearity problem in regression analysis based on the value of VIF<10 and I/VIF >0.1

The analysis for the prior and post 1997 periods (full sample) as reported in Table 4.17 suggests that dividends as proxied by dividend to book value is insignificantly related to

[151] Refer the graph of normality on appendix 3.

pension fund ownership. The result again suggests that pension funds have no tendency to increase their investment in firms with higher dividends. While past year dividends is not significantly related to pension fund ownership, stable increases in dividend again appears to increase the likelihood of pension fund ownership. The study also finds similar result when the analysis using the sub-sample of "dividend paying firms with pension fund ownership" is repeated. A significantly positive relationship is again found for the leverage variable proxied by debt to equity. Similar to previous result based on dividend yield, the size of the firm in this subsample group is negatively related to pension fund ownership. In other words pension funds may increase their investment in small firms if the firms are already committed as dividend payer. Contrary to results reported earlier using dividend yield, the study suggests that pension funds are likely to invest in higher growth firms. A significantly negative relationship is found between leverage and pension fund ownership suggesting that pension funds avoid risky firms. The result is also similar to previous result proxied by dividend yield. The other characteristics of firms do not significantly influence the pension funds investment.

Overall, the current study finds no relationship between pension fund ownership and dividend payout. However, stable increase in dividend per share, appears to have a significantly positive relationship with pension fund ownership. Likewise the coefficient for stable increase in dividend is significantly different from zero for any sub-sample. The consistent results reported in the study using both dividends and dividend to book value suggest that management wishing to attract pension funds might consider a policy of stable increases in dividend. It is not necessary for them to choose high dividend payout and maintain high payout to retain investment. In addition to stable increases in dividend, the management may also focus on the ratio of debt to equity to attract pension funds investment. The result, based on dividend to book value for both sample periods, shows that the pension funds prefer firms with lower debt to equity. The study also provides evidence on the tax-clientele effect[152], where pension funds prefer high dividends in the period prior to 1997 tax changes[153]. The following section further discusses the result for the post 1997 period.

[152] That is the period in which pension funds (tax exempt investor) allows to claims the tax credit given tax exempt investor.

[153] However, the result is based only on one year period of time, thus cannot be generalized.

Table 4.17: The effect of last year's dividends to book value on this year's pension fund ownership using full sample firms (post and prior 1997)

This table reports the results of panel data regression analysis on the effect of last year's dividends to book value on this year's pension fund ownership using full sample firms (post and prior 1997).

$$Pfownit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 Sizeit + \beta 3 Growthit + \beta 4 Riskit + \beta 5 Levit + \beta 6 Abreturnit + \beta 7 Divstabit + \beta 8 Divi(t\text{-}1) X\, Dumbtxijt + e\, it \quad (4.3)$$

	Full sample firms with pension fund ownership		Sample dividend paying firms with pension fund ownership	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
Last year's dividend	-0.001	-0.001	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Size	-0.075**	-0.075	-0.149*	-0.149**
	(0.033)	(0.050)	(0.039)	(0.065)
Growth	0.001	0.001	0.004**	0.004**
	(0.004)	(0.004)	(0.006)	(0.012)
Risk	-0.002	-0.002	-0.003**	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)
Leverage	-0.002***	-0.001**	-0.002	-0.002**
	(0.000)	(0.001)	(0.000)	(0.000)
Abnormal return	0.012	0.012	0.010	0.010
	(0.041)	(0.039)	(0.050)	(0.050)
Stable increases in dividend	0.374***	0.374***	0.370***	0.370***
	(0.056)	(0.090)	(0.057)	(0.088)
Dividend X dummy prior	0.012**	0.012	0.174***	0.174***
1997	(0.005)	(0.007)	(0.035)	(0.033)
Constant	2.223***	2.223***	2.726***	2.726***
	(0.190)	(0.295)	(0.232)	(0.388)
F	10.09	3.86	13.060	7.18
Number of observation	2912	2912	2497	2497
Sigma_u	1.153	1.153	1.177	1.177
Sigma_e	0.922	0.922	0.927	0.927
Rho	0.610	0.610	0.617	0.617
R2: within	0.0316	0.0316	0.0467	0.0467
R2:between	0.0016	0.0016	0.0022	0.0022
R:overall	0.0016	0.0016	0.0003	0.0003

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

The following Table 4.18 reports the result for post 1997 period using dividend to book value ratio as proxy for dividend payout. The result shows that dividend to book value insignificantly related to pension fund ownership, and again supports the previous finding by Greinstein and Michaely (1997). On the other hand, stable increases in dividend is again significantly related to pension fund ownership. The result suggests that whilst pension funds may not require dividend payout for their investment, they do expect stable increase in dividends. A similar result is reported for size, growth and leverage variables. The next section discusses whether pension funds increase their investment following increase in dividend payout.

Table 4.18: The effect of last year's dividends to book value on this year's pension fund ownership using sample firms for post 1997

This table reports the results of panel data regression analysis on the effect of last year's dividends to book value on this year's pension fund ownership using sample firms for post 1997**:**

$$Pfownit = \beta o + \beta 1 Pfowni(t-1) + \beta 2\, Divi(t-1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\, it \quad (4.4)$$

	Full sample firms with pension fund ownership		Sample dividend paying firms with pension fund ownership	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
Last year's pension fund ownership	0.371*** (0.015)	0.371*** (0.031)	0.392*** (0.016)	0.392*** (0.030)
Last year's year dividend	-0.003* (0.002)	-0.003 (0.004)	-0.005** (0.002)	-0.005 (0.004)
Size	-0.059** (0.029)	-0.059 (0.038)	-0.130*** (0.035)	-0.130*** (0.047)
Growth	0.004 (0.003)	0.004 (0.003)	0.010* (0.005)	0.010* (0.011)
Risk	-0.001 (0.001)	-0.001 (0.001)	-0.002 (0.002)	-0.002 (0.002)
Leverage	-0.001*** (0.000)	-0.001** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)
Abnormal return	0.008 (0.036)	0.008 (0.033)	-0.018 (0.044)	-0.018 (0.043)
Stable increase in dividend	0.249*** (0.051)	0.249*** (0.063)	0.242*** (0.052)	0.242*** (0.063)
Constant	1.486*** (0.173)	1.486*** (0.230)	1.939*** (0.212)	1.939*** (0.294)
F	89.47	23.16	86.180	30.28
Number of observation	2828	2828	2416	2416
Sigma_u	0.784	0.784	0.807	0.807
Sigma_e	0.811	0.811	0.812	0.812

	Full sample firms with pension fund ownership		Sample dividend paying firms with pension fund ownership	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
Rho	0.483	0.483	0.497	0.497
R2: within	0.2302	0.2302	0.2514	0.2514
R2:between	0.6383	0.6383	0.5182	0.5182
R:overall	0.4709	0.4709	0.4099	0.4099

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

4.4.4 Does Pension Fund Ownership Follow an Increase in Dividend?

The result reported earlier suggests that the level of dividends is not significantly related to the level of pension fund ownership. This section further tests the relationship between dividends and pension fund ownership using changes of dividends as well as changes in pension fund ownership to establish causality effect. The study also performs similar test related to linear regression analysis to make sure the model adapted is preferable. The analysis firstly uses changes in dividend yield as a proxy for dividend changes. The study then repeats the analysis using changes in dividend to book value which is not affected by the market price as a proxy for changes in dividend payout. The analysis is necessary to better understand the relationship between dividends and pension fund ownership.

A similar test is again applied. The result of the Hausman test on the null hypothesis of the coefficients estimated by the efficient random effects estimator is the same as the ones estimated by the consistent fixed effects estimator, is rejected for both proxies of dividends, suggesting that the fixed effects model should be used[154]. The study uses robust cluster fixed effects panel data regression analysis to overcome the problem of heteroskedasticity and autocorrelation. Likewise, the normality assumption is violated when using both proxies of dividends[155]. Again, no further action is taken since the study relies on the Central Limit Theorem that suggests a large sample of data should approach normality. The result on omitted variables based on Ramsey test shows that the null hypothesis of no omitted variables is also rejected[156]. Therefore, the study concludes that the model applied has a problem of omitted variables. However, the uses of fixed effects model in the current study reduces the problem of omitted variables in the model adapted. Further test shows that the problem of multicollinearity[157] is not present in the regression model using both proxies of dividends.

The study questions whether changes in previous year dividend influence the changes in pension fund ownership. Greinstein and Michaely (2005) suggest that the changes in past

[154] The result of the Hausman test for null hypothesis using dividend yield and dividend to book value as proxies for dividend is rejected at (chi-square=54.16, p<.05) and (chi -square=546.19, p<0.05), respectively.

[155] The graph of normality is presented in Appendix 3. The test for normality using Shapiro Wilk test shows that the null hypotheses on normality assumption is rejected using both proxies of dividend yield and dividend to book ratio at (z=17.1, p<.05)and (z=16.75, p<.05 respectively).

[156] Ramsey test shows the null hypothesis is rejected using both proxies of dividend yield and dividend to book value at (F=302.8, p<.05) and (F=209.99, p<.05) respectively.

[157] The value of variance inflation factor is lower that 10 (VIF<10) and the tolerance value is higher than 0.01 (and I/VIF >0.1).

year dividends do not influence institutional investment, going against the idea that institutions pressurise management to increase payouts, either through repurchasing or through dividends. On the other hand, they find strong evidence that institutional investors increase their holdings in firms that repurchase more and in firms that increase their repurchasing. The current study however, limits the analysis only for dividends, ignoring the effect of repurchases activities. The abolition of the tax credit given to tax exempt institutions after 1997 tax changes relates mostly to dividend policy issues. Even though the changes may also affect the share repurchase activities, more concern should be given to dividend policy rather than share repurchases to better understand the practice of dividend payout after the tax changes came into effect.

Table 4.19 summarise the result of the hypothesis testing based on Equation (3.3). The third hypothesis (Hypothesis 1(c)), stated in alternative form, examines whether pension funds increase their investment following increase in dividend payout. In line with Greinstein and Michaely study, the results do not provide support for a positive relationship between the changes of past dividends a firm pays and changes in pension fund ownership. The result is consistent for both definitions of dividend payout. Again, the results strongly suggest that higher dividend might not be a reason to encourage pension funds to invest. On the other hand the role of stable increases in dividend per share for five consecutive years appears to be important in this study. The result shows that a coefficient for stable increases in dividend is (coefficient=0.098, $p<.05$) significantly different from zero, suggesting a positive relationship between the stable increases in dividend and changes of pension fund ownership. The result suggests that firms which increase dividends for the last five years may attract more pension funds investment. As discussed earlier, the result is in line with the Del Guercio (1996) study which suggests that stability of dividend is proven to be an important indicator of prudent investment; thus it is considered an important factor in the institutional investor's portfolio selection. Therefore, the possible explanation why pension funds in the UK look for stable increase dividend paying firms may be also due to prudent investment. As discussed earlier, it is also reasonable for institutional investors including pension funds in the UK, to invest in firms that follow stable increases in dividend in order to increase the likelihood of a stable[158] cash flow stream to support and fund their liabilities.

[158] Short et al. (2002) suggest institutions will prefer dividends as they need 'predictable' cash flows on an ongoing basis to fund their activities.

In line with Del Guercio (1996); Lakonishok, et al. (1994); and Shefrin and Statman (1995) the study suggests that investment by pension funds could also be related to firm size. The significant positive relationship between size and a change in pension funds investment suggests that the changes in pension fund ownership are more likely to happen in larger firms ($p<.05$). As mentioned earlier, pension funds have possibilities of investing in large firms since large firms refer to matured and established firms, and investing in such firms might be viewed as a prudent investment.

The study reports weak evidence on the negative relationship between risk variable proxied by a standard deviation of return to pension fund ownership (coefficient=-0.001, $p<0.05$) implying that pension funds have the possibility of increasing their investments in lower risk firms, this is in line with the prudent investment concept. The leverage variable proxied by debt to equity is in a significantly negative relationship with the changes in pension fund ownership. The result implies that pension funds may reduce their investment in high leverage firms. The other variables, including growth, risk and abnormal returns are not significantly related to pension fund ownership.

Table 4.19: The effect of changes in pension fund ownership subsequent to changes in dividend

This table reports the results of panel data regression analysis on the effect of changes in pension fund ownership subsequent to changes in dividend:

$$\Delta Pfownit = \beta o + \beta 1 Pfowni(t-1) + \beta 2 \Delta Divi(t-1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\ it \quad (4.5)$$

	Dividend yield		Dividend to book value	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
Last year's pension fund ownership	-0.531***	-0.531***	-0.512***	-0.512***
	(0.011)	(0.032)	(0.011)	(0.032)
Changes in last year's dividend	0.002	0.002	-0.003***	-0.003
	(0.003)	(0.002)	(0.001)	(0.003)
Size	0.039***	0.039**	0.038**	0.038*
	(0.015)	(0.018)	(0.017)	(0.022)
Growth	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.002)	(0.001)
Risk	-0.001*	-0.001**	-0.001*	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Leverage	0.000*	0.000	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Abnormal return	-0.008	-0.008	-0.006	-0.006
	(0.019)	(0.015)	(0.021)	(0.017)
Stable increases in dividend	0.098***	0.098**	0.093***	0.093**
	(0.034)	(0.043)	(0.035)	(0.044)
Constant	0.280***	0.280***	0.311***	0.311***
	(0.066)	(0.086)	(0.078)	(0.106)
F	313.3	35.08	258.22	36.73
Number of observation	5416	5416	4932	4932
Sigma_u	0.532	0.532	0.525	0.525
Sigma_e	0.669	0.669	0.677	0.677
Rho	0.388	0.388	0.375	0.375

	Dividend yield		Dividend to book value	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
R2: within	0.3491	0.3491	0.3287	0.3287
R2:between	0.2533	0.2533	0.2274	0.2274
R:overall	0.2278	0.2278	0.2088	0.2088

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

4.4.5 Summary of the Findings

Both t-test and non-parametric test provide evidence of a difference between the dividend paying and non-dividend paying firms and the result suggests that pension funds are likely to invest in dividend paying firms. On the other hand, pension funds are likely to invest in low-dividend paying firms compared to high-dividend paying firms based on similar tests. Greinstein and Michaely (2005) also report that some institutions actually prefer low-dividend to high-dividend stocks. The study also divides the firms into stable increases and non-stable increases in dividend groups. The result shows that that pension funds are likely to invest more in stable increase than non-stable increase in dividend firms. This result only holds for the bi-variate analysis, whereas the regression analysis presents evidence of no relationship between last year's dividend payout and this year's pension fund ownership, except for the sub-sample of dividend paying firms with pension fund ownership; and dividend yield is proxied for dividend payout. The result shows that pension funds have a tendency to invest in lower dividend payout.

The second hypothesis, examines whether pension funds increase their investment following increase in dividends. The result also rejects the hypothesis, thus concluding that dividends may not influence the decision to increase investment by pension funds. However, the role of dividends is still significant since the result for all sub-sample firms strongly suggests that the stable increases in dividend is significantly related to pension funds investment practice. The result suggests that pension funds prefer firms with stable increases in dividend per share for five consecutive years. The reasons might be related to the role of signalling, in that pension funds may use dividends (stable increases in dividend) as a signal of the true worth of their investment. Alternatively, pension funds may prefer such firms due to prudent investment practice; or pension funds may increase their investment into firms

with stable increases in dividend aiming for stable cash flow. Even though pension fund are not initially attracted to high dividend paying firms, does not necessarily mean that pension funds do not prefer high dividends. Assuming pension funds prefer high dividends, this study then questions whether pension funds exert pressure on management to increase their dividend payout which is discussed in the following chapter. The following Table 4.20, Table 4.21 and Table 4.22 summarise the research findings discussed in this chapter:

Table 4.20: Comparison between expected and actual results on the effects of last year's dividend on this year's pension fund ownership using sample firms with pension fund ownership

This table reports the expected and actual results of panel data regression analysis on the effects of last year's dividend on this year's pension fund ownership using sample firms with pension fund ownership:

Full sample (prior and post 1997) period:

$$Pfownit = \beta o + \beta 1\, Divi(t-1) + \beta 2 Sizeit + \beta 3 Growthit + \beta 4 Riskit + \beta 5 Levit + \beta 6 Abreturnit + \beta 7 Divstabit + \beta 8 Divi(t-1) X\, Dumbtxijt + e\, it \quad (4.6)$$

Sample post 1997 period:

$$Pfownit = \beta o + \beta 1 Pfowni(t-1) + \beta 2\, Divi(t-1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\, it \quad (4.7)$$

Independent variables	Proxy	Sample firms result	Full sample firms (prior and post 1997): Equation (4.6)		Post 1997 sample firms: Equation (4.7)	
		Regression analysis	Random effects	Fixed effects	Fixed effects	Fixed effects
		Expected result	Actual results			
			dividend yield	dividend to book	dividend yield	dividend to book
Last year's pension fund ownership	Last year's pension fund ownership	Positive	Not applicable	Not applicable	Positive***	Positive***
Last year's dividend	Last year's dividend	Positive	Insignificant	Insignificant	Insignificant	Insignificant
Size	Log market capital	Positive	Insignificant	Insignificant	Insignificant	Insignificant
Growth	Market to book ratio	Positive	Insignificant	Insignificant	Insignificant	Insignificant
Risk	Standard deviation of return of stock	Negative	Negative**	Insignificant	Insignificant	Insignificant
Leverage	Debt to equity	Negative	Insignificant	Negative**	Positive*	Negative**

Independent variables	Proxy	Sample firms result	Full sample firms (prior and post 1997): Equation (4.6)		Post 1997 sample firms: Equation (4.7)	
		Regression analysis	Random effects	Fixed effects	Fixed effects	Fixed effects
		Expected result	Actual results			
			dividend yield	dividend to book	dividend yield	dividend to book
Abnormal return	Abnormal return	Positive	Insignificant	Insignificant	Insignificant	Insignificant
Stable increases in dividend	5 years continuously increase in dividend per share	Positive	Positive***	Positive***	Positive***	Positive ***
Dividend X dummy prior 1997	Dividend X dummy prior 1997	Positive	Positive	Insignificant	Not applicable	Not applicable

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively.

Table 4.21: Comparison between expected and actual results on the effects of last year's dividend on this year's pension fund ownership using sample dividend paying firms with pension fund ownership

This table reports the expected and actual results of panel data regression analysis on the effects of last year's dividend on this year's pension fund ownership using sample dividend paying firms and with pension fund ownership:

Full sample (prior and post 1997) period:

$$Pfownit = \beta o + \beta 1\, Divi(t-1) + \beta 2 Sizeit + \beta 3 Growthit + \beta 4 Riskit + \beta 5 Levit + \beta 6 Abreturnit + \beta 7 Divstabit + \beta 8 Divi(t-1) X\, Dumbtxijt + e\, it \quad (4.8)$$

Sample post 1997 period:

$$Pfownit = \beta o + \beta 1 Pfowni(t-1) + \beta 2\, Divi(t-1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\, it \quad (4.9)$$

Independent variables	Proxy	Sample firms result	Full sample firms (prior and post 1997): Equation (4.8)		Post 1997 sample firms: Equation (4.9)	
		Regression analysis	Random effects	Fixed effects	Fixed effects	Fixed effects
		Expected result	Actual results			
			dividend yield	dividend to book	dividend yield	dividend to book
Last year's pension fund ownership	Last year's pension fund ownership	Positive	Not applicable	Not applicable	Positive***	Positive***
Last year's dividend	Last year's dividend	Positive	Insignificant	Insignificant	Negative*	Insignificant
Size	Log market capital	Positive	Negative**	Negative**	Negative***	Negative***
Growth	Market to book ratio	Positive	Negative**	Positive**	Insignificant	Positive*
Risk	Standard deviation of return of stock	Negative	Negative**	Insignificant	Insignificant	Insignificant
Leverage	Debt to equity	Negative	Insignificant	Negative**	Positive*	Negative***
Abnormal return	Abnormal return	Positive	Insignificant	Insignificant	Insignificant	Insignificant

Independent variables	Proxy	Sample firms result	Full sample firms (prior and post 1997): Equation (4.8)		Post 1997 sample firms: Equation (4.9)	
		Regression analysis	Random effects	Fixed effects	Fixed effects	Fixed effects
		Expected result	Actual results			
			dividend yield	dividend to book	dividend yield	dividend to book
Stable increases in dividend	5 years continuously increase in dividend per share	Positive	Positive***	Positive***	Positive***	Positive***
Dividend X dummy prior 1997	Dividend X dummy prior 1997	Positive	Positive***	Positive***	Not Applicable	Not applicable

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively.

Table 4.22: Comparison between expected and actual results of the effect of changes in pension fund ownership subsequent to changes in dividend

This table reports the expected and actual results of panel data regression analysis on the effect of changes in pension fund ownership subsequent to changes in dividend:

$$\Delta Pfownit = \beta o + \beta 1 Pfowni(t-1) + \beta 2 \Delta Divi(t-1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Riskit + \beta 6 Levit + \beta 7 Abreturnit + \beta 8 Divstabit + e\ it \quad (4.10)$$

Hypothesis	Proxy	Expected result	Actual result Fixed effects (changes in dividend yield)	Actual result Fixed effects (changes in dividend to book)
Last year's pension fund ownership	Last year's pension fund ownership	Negative	Negative***	Negative***
Last year's changes in dividend	Last year's changes in dividend	Positive	Insignificant	Insignificant
Size	Log market capital	Positive	Positive**	Positive*
Growth	Market to book ratio	Positive	Insignificant	Insignificant
Risk	Standard deviation of return of stock	Negative	Negative*	Negative*
Leverage	Debt to equity	Negative	Insignificant	Negative***
Abnormal return	Abnormal return	Positive	Insignificant	Insignificant
Stable increase in dividend	5 years continuously increase in dividend per share	Positive	Positive***	Positive***

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively.

Chapter 5 : Findings on the Effect of Pension Fund Ownership on Dividends

5.1 Introduction

Previous researches on dividend payout are based on a few theories, including signalling hypothesis, dividend-clientele hypothesis (e.g., dividend tax hypothesis) and agency theory hypothesis. The conflict of evidence on dividend policy as discussed earlier in Chapter Two may continuously encourage discussion among researchers (dividend puzzle). The study examines for evidence on whether pension funds that do not appear to be influenced, initially, by high dividends subsequently exert pressure on management to increase dividend payout. Institutional investors may need dividend income[159] and it is possible that their position as major investors combined with opportunities to meet the appropriate personnel of firms, allows them to exert influence. This chapter discusses the result of hypotheses testing on whether a positive relationship exists between last year's pension fund ownership and this year's dividend payout (Hypothesis 2(a)); and whether firms increase their dividends subsequent to increase in pension funds investment (Hypothesis 2(b)). The study firstly runs the analysis using dividend to book value instead of dividend yield because dividend yield might be affected by the market price, and therefore, out of management control. The study also repeats the analysis using dividend per share and dividend to earnings. Examining dividends to earnings is more useful as it reflects the management's decision to distribute the profits to the shareholders. However, when the firms are running at loss, the dividend to earnings ratio is no longer useful. This study therefore drops the sample firms with negative earnings when analysis is repeated using dividend to earning.

This chapter is arranged as follows: Firstly, the study provides an overview of the sample characteristics of the study. Secondly, the study tests and discusses the underlying assumptions of linear regression analysis. The last part of this section summaries and concludes the results presented in Chapter Five.

[159] Short et al. (2002) argue that institutions prefer dividends as they need 'predictable' cash flows on an ongoing basis to fund their activities. Institutions' requirements for certain levels of dividends to meet their own liabilities may force companies to pay out dividends at higher levels than they would otherwise prefer.

5.2 Sample Description and Sample Statistics

The samples used in this model of dividend policy are derived from the same population as the one used in ownership model except, some of the sample firms continue to be tested in this model but not in the previous model due to the availability of the data. The variables used in this model do not rely heavily on share price[160], thus allowing the related sample firms to be included in the model. This section therefore provides the descriptive statistics to better understand the distribution of the sample firms used in this model. As mentioned in Chapter Four, the sample is from non-financial firms listed on the London Stock Exchange for the period of March 1997 to December 2008. The first part of this section provides the bar charts to summarise the sample distribution used in this study. The second part provides details of the sample selection for each of the years during the period of analysis. A chi-square (X^2) statistic is conducted and discussed to investigate whether a significantly higher percentage of dividend paying firms have pension funds as investors[161].

Again, the sample firms are classified into five groups: dividend paying firms; non-dividend paying firms; firms with pension fund ownership; firms without pension fund ownership; and all samples. Bar charts are used to summarise the sample distribution for these five groups. The following Figure 5.1 show that the number of firms varies throughout the year due to the use of unbalanced data selection as the study uses only those firms for which all the data is available on Thomson One Banker. The Table reports a similar pattern of sample distribution compared to sample distribution used in previous model. The first chart[162] shows that the majority of the firms in the sample study are the dividend paying firms. The percentage of sample dividend paying firms to total sample reduces with time. Year 1997 appears to have the highest percentage of dividend paying firms at 81% whereas

[160] The previous model (Equation (3.1), (3.2) and (3.3)) uses; (1) abnormal returns and standard deviation of stock returns as independent variables. The study uses monthly share prices to calculate the beta value and abnormal returns. If the share price is missing for certain months, neither the standard deviation value nor the abnormal returns can be computed; hence observations with missing share prices are omitted; (2) stable increases in dividends requires five years' dividend history. If this is not available the observation is omitted.

[161] According to Zikmund (2003), the chi square statistics is a test that statistically determines significances in analysis of the frequency distributions and it allows the study to test for differences in two groups' distributions across categories.

[162] Chart (a).

2008 has the lowest with 53% of firms paying dividends. The second chart[163] shows that the distribution ratio for firms with and without pension funds, is not much different.

The bar charts (c) and (d) summarise the distribution sample for firms with and without pension fund ownership respectively based on the sub-samples of dividend and non-dividend paying firms. Again, dividend paying firms, tend to comprise more firms with pension fund ownership than without. Conversely, more firms have no pension fund ownership for the non-dividend paying sample. Bar charts (e) and (f) summarise the sample distribution based on firms with and without pension fund ownership groups. Both groups are now further divided into dividend and non-dividend paying firms. The firms with pension fund ownership comprise more firms that pay dividends than those that do not. The pattern is quite similar for group of firms without pension fund ownership except for the period after 2005 where more firms in this group pay no dividends.

Additional to the pictorial representation of the sample distribution, Table 5.1 shows the result of the test which examines whether firms with and without pension fund ownership are equally distributed among dividend paying and non-dividend paying firms. Chi-square (X^2)[164] statistic is again conducted and the result shows that the null hypothesis of equal distribution is rejected at the 1% level (chi-square test with one degree of freedom (df=1) having a critical value of more than 3.841 at a 5% level of significance) for all years. Therefore, there is evidence that pension funds invest in dividends rather than non-dividend paying firms.

[163] Chart (b).

[164] According to Zikmund (2003), the chi-square statistic is a test that statistically determines significances in analysis of the frequency distributions and it allows the study to test for differences in two groups' distributions across categories.

Figure 5.1: Sample distribution

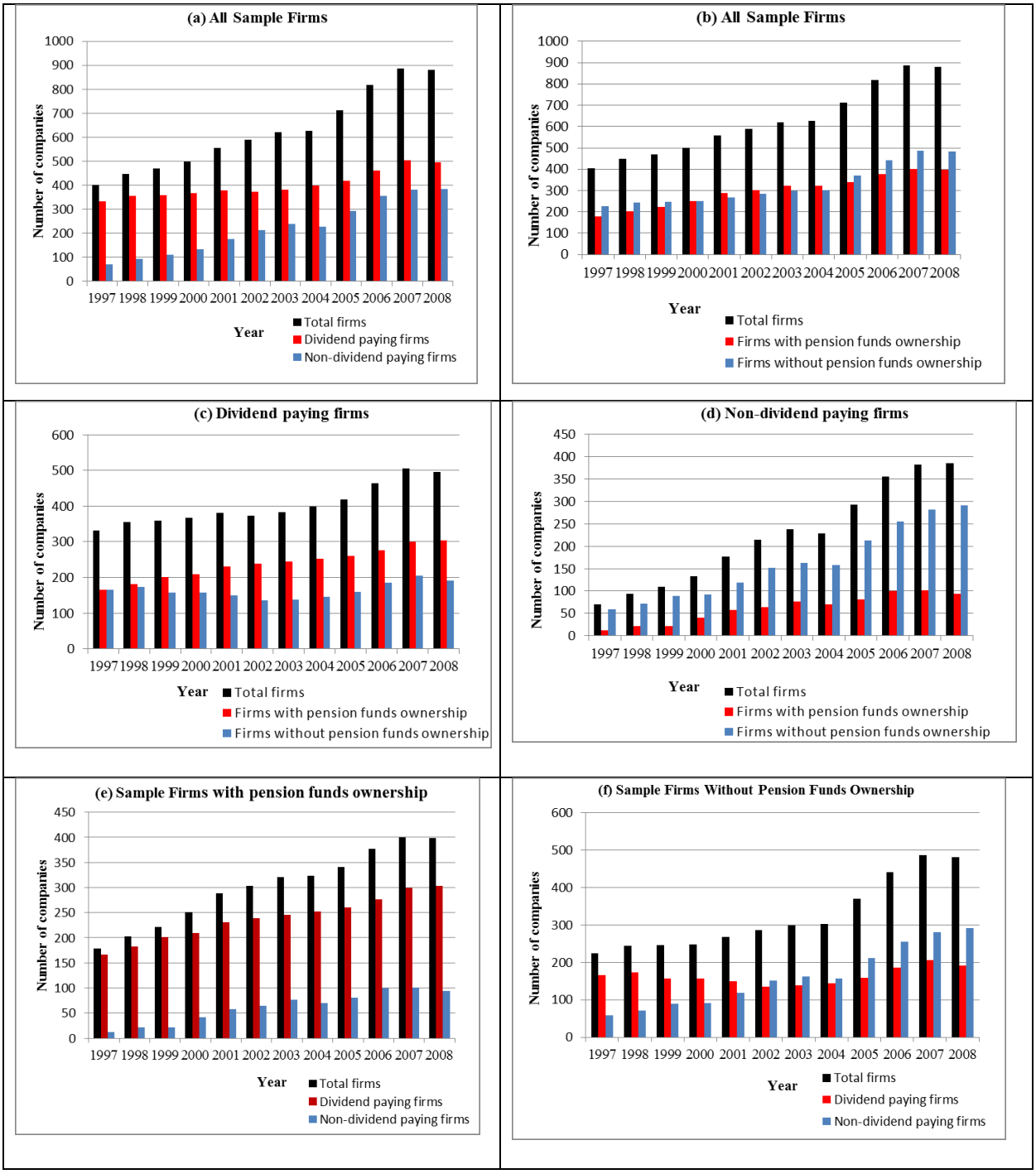


Table 5.1: Sample firms according to dividend payment status: Year by year analysis

Ho: Pension fund ownership is equally distributed between dividend and non-dividend paying companies

Year	Categories	Dividend paying firms		Non- dividend paying firms		Total		X^2
		No	%	No	%	No	%	
2008	with pension fund	304	61.41	94	24.42	398	45.23	
	without pension fund	191	38.59	291	75.58	482	54.77	
	Total	495	56.25	385	43.75	880	100	119.67***
2007	with pension fund	299	59.21	101	26.44	400	45.10	
	without pension fund	206	40.79	281	73.56	487	54.90	
	Total	505	56.93	382	43.07	887	100	94.32***
2006	with pension fund	277	59.83	100	28.17	377	46.09	
	without pension fund	186	40.17	255	71.83	441	53.91	
	Total	463	56.60	355	43.40	818	100	81.05***
2005	with pension fund	260	62.05	81	27.65	341	47.89	
	without pension fund	159	37.95	212	72.35	371	52.11	
	Total	419	58.85	293	41.15	712	100	81.80***
2004	with pension fund	253	63.57	70	30.70	323	51.60	
	without pension fund	145	36.43	158	69.30	303	48.40	
	Total	398	63.58	228	36.42	626	100	62.70***
2003	with pension fund	245	63.97	76	31.93	321	51.69	
	without pension fund	138	36.03	162	68.07	300	48.31	
	Total	383	61.67	238	38.33	621	100	60.33***
2002	with pension fund	239	63.90	64	29.77	303	51.44	
	without pension fund	135	36.10	151	70.23	286	48.56	
	Total	374	63.50	215	36.50	589	100	63.69***
2001	with pension fund	231	60.79	58	32.77	289	51.89	
	without pension fund	149	39.21	119	67.23	268	48.11	
	Total	380	68.22	177	31.78	557	100	37.98***
2000	with pension fund	210	57.22	41	30.83	251	50.20	
	without pension fund	157	42.78	92	69.17	249	49.80	
	Total	367	73.40	133	26.60	500	100	27.20***
1999	with pension fund	201	55.99	21	19.09	222	47.33	
	without pension fund	158	44.01	89	80.91	247	52.67	
	Total	359	76.55	110	23.45	469	100	45.98***
1998	with pension fund	182	51.27	21	22.58	203	45.31	
	without pension fund	173	48.73	72	77.42	245	54.69	
	Total	355	79.24	93	20.76	448	100	24.47***
1997	with pension fund	166	50.00	12	16.90	178	44.17	
	without pension fund	166	50.00	59	83.10	225	55.83	
	Total	332	82.38	71	17.62	403	100	25.98***
Total	with pension fund	2867	59.36	739	27.57	3606	48.02	
	without pension fund	1963	40.64	1941	72.43	3904	51.98	
	Total	4830	64.31	2680	35.69	7510	100	697.58

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

The next section highlights the sample firms' characteristics including mean, median, standard deviations, and minimum and maximum values for a number of variables.

5.2.1 Sample Characteristics

Table 5.2 shows the descriptive statistics for the continuous variables utilised in this study. Of the sample of 7,510 observations, the mean for dividend to book value is 4.583% with the minimum and maximum values of zero and 59.413% respectively. About 59% of the sample firms have dividend to book value of less than 4.583%. A similar pattern is reported for past year's dividend to book value. The mean for past year dividend pension fund ownership is at 0.951% with minimum and maximum values of zero and 13.79% respectively. The majority of the firms (68%) in the sample have pension funds investment of less than 0.951%. The mean value for size, proxied by market capitalisation[165], is £1,262 million with minimum and maximum values of £0.247 million and £213,749 million, respectively. The spread of firms by size is skewed; with the majority of the firms (89%) being less than the mean market capitalisation value. The current study uses log market capital to normalise the size variable. Other variables which are also skewed are growth (market-to-book ratio), liquidity (current ratio) and leverage (debt to equity) with 69%, 70% and 67% of companies being less than the mean, respectively. The profit variable also skewed but with the majority of the firms (71%) being greater than mean return on equity (-1.79).

[165] Current study uses log market capital in the model.

Table 5.2: Summary of mean, standard deviation, minimum and maximum values for variables in equation (3.10)

This table provide summary for the mean, standard deviation, minimum and maximum value of variables used in the study.

	Total sample	Mean	Standard deviation	Min	Max	% firms (≤mean)	% firms (>mean)
Dividend to book value	7510	4.583	5.418	0.000	59.413	58.642	41.358
Last year's dividend to book value	7510	4.780	5.960	0.000	74.937	59.148	40.852
Last year's pension fund ownership	7510	0.951	1.603	0.000	13.790	68.362	31.638
Size	7510	1262.599	7290.504	0.247	213749.300	88.961	11.039
Growth	7510	2.899	3.656	0.017	68.266	69.747	30.253
Profitability	7510	-1.709	44.473	-299.789	494.944	28.735	71.265
Liquidity	7510	1.960	1.692	0.000	11.994	70.732	29.268
Leverage	7510	47.500	75.105	-208.072	1307.778	66.937	33.063

To examine whether pension funds prefer dividend-paying stocks to non-dividend paying stocks, the next section discusses the tests for differences between dividend paying firms and non-dividend paying firms.

5.3 Effect of Pension Funds Ownership on Dividend Payout

5.3.1 Introduction

The study by Baker and Wurgler (2004), among other findings, suggests that dividend payments are made in response to demands from investors. In general, the presence of a non-neutral tax, or changes in tax regulations, will motivate firms to increase or decrease dividends or to substitute them with a share repurchase. Dhanani (2005) suggests that shareholder requirements are a significant factor when formulating dividend policies as he considers that the shareholders' needs are very likely to be important given that the existence of certain tax benefits will influence the investors' preferences towards dividends or share repurchases. This scenario is also reported in a study by Rau and Vermaelen (2002), who show that high-tax individuals tend to prefer share repurchases to dividends but low-tax individuals are indifferent between the two. The current study now examines the fourth and fifth hypothesis, again stated in alternative form: (1) whether a positive relationship exists between last year's pension fund ownership and this year's dividend payout; and (2) whether high dividend payout is achieved subsequent to investment by pension funds.

5.3.2 Assumptions of Linear Regression Analysis

As discussed earlier in Chapter four, there are five statistical assumptions for a multiple regression model: existence; independence; linearity; homoscedasticity; and normality (Kleinbum et al., (2008). The following Table 5.3 summarise the result of the related test according to different proxies of dividends. Based on the Shapiro Wilk test, the normality assumption is violated for all models at $p<.05$. However, no further action is taken since the study assumes normality based on the Central Limit Theorem. The Ramsey test also rejects the null hypothesis of no omitted variables in the model, suggesting that the model might have a problem of omitted variables. The problem of omitted variables is less severe in panel fixed effects regression analysis. To choose between random and fixed effects model, the study runs the Hausman test. The result suggests rejection of the null hypothesis at $p<.05$; hence fixed effects model is used. The study uses robust cluster fixed effects panel data regression analysis to also reduce the potential problem of heteroscedasticity and autocorrelation.

Table 5.3: Test for appropriateness of dividend model

Dividend proxy	Dividend to book Equation (3.10)	Dividend per share Equation (3.10)	Dividend to earnings Equation (3.10)	Changes dividend to book Equation (3.12)	Changes dividend per share Equation (3.12)	Changes dividend to earnings Equation (3.12)
Observation	4830	4799	3292	7195	7373	3639
Shapiro Wilk Test	Z=15.02 (p<.05)	Z=20.26 (p<.05)	Z=11.96 (p<.05)	Z=17.72 (p<.05)	Z=100.632 (p<.05)	Z=12.11 (p<.05)
Ramsey Test	F=38.47 (p<.05)	F=731.11 (p<.05)	F=293.66 (p<.05)	F=293.66 (p<.05)	F=100.63 (p<.05)	F=107.22 (p<.05)
Hausman Test	Chi2=661 (p<.05)	Chi2=602 (p<.05)	Chi2=758 (p<.05)	Chi2=1630 (p<.05)	Chi2=64.36 (p<.05)	Chi2=1097 (p<.05)

The study also tests for the problem of multicollinearity in regression analysis to assume that the predictor variables are not correlated with each other. Multicollinearity means the predictors are highly linearly related; this can cause problems in estimating the regression coefficients. Therefore, the study performs multicollinearity test and discusses it in this chapter. Table 5.4 reports the correlation test for continuous variable[166] and the result shows a high correlation between past year dividends and current year dividends, suggesting that current year dividend policy is related to past year dividends. The result exhibits a positive correlation between size and past year pension fund ownership (0.36), suggesting that the larger firms are likely to have higher pension fund ownership. The medium positive correlation between size and both current (0.46) and past year dividends (0.42), suggests that dividend payout are more likely to be higher in larger firms. A positive correlation is identified between the growth (0.2), profit (0.4) and leverage (0.23) variables suggesting dividend payout are likely to be higher in firms with higher growth, higher profit and more leverage. The result exhibits a negative correlation of -0.24 between liquidity and dividends suggesting that firms with higher dividends are likely to have

[166] For quantitative variables, correlation is tested by Pearson correlation coefficient and the association between a categorical and a continuous variable can be assessed by t-test.

lower current ratio. Table 5.4 also exhibits lower correlations (between -3 and 3.0) for the other variables.

Table 5.4: Correlation test for variables in Equation (3.10)

This table provides summary for the result of correlation test for variables in Equation (3.10):

	Variables	1	2	3	4	5	6	7	8
1	Dividend to book value	1							
2	Last year's dividend to book value	0.911	1						
3	Last year's pension fund ownership	0.186	0.171	1					
4	Size	0.460	0.417	0.357	1				
5	Growth	0.200	0.171	-0.008	0.195	1			
6	Profitability	0.407	0.366	0.104	0.338	-0.070	1		
7	Liquidity	-0.239	-0.225	-0.079	-0.169	0.031	-0.101	1	
8	Leverage	0.227	0.222	0.079	0.170	0.113	-0.052	-0.283	1

To further test the existence of multicollinearity problems, the study refer to tolerance value and VIF. The result as reported in Table 5.5 shows that the tolerance value (1/VIF) for all variables is more than 0.01 and the VIF is less than 10. The study therefore assumes that there is no evidence of the existence of high multicollinearity in this study. The next part discusses the results of the regression analysis using different proxies of dividends.

Table 5.5: Multicollinearity test for variables in equation (3.10)

Variable	VIF	1/VIF
Last year's year dividend to book value	1.41	0.709
Last year's pension fund ownership	1.16	0.863
Size	1.49	0.670
Growth	1.11	0.903
Profitability	1.29	0.775
Liquidity	1.14	0.878
Leverage	1.16	0.858
Mean VIF	1.25	

The study runs the model separately for different proxies of dividend payout including: dividend to book value; dividend per share; and dividend to earnings. Similar to the argument as discussed earlier in Chapter Four, the linear regression model may not suitable for the model with zero value (in this case, non-dividend paying firms). Therefore, the study runs the analysis for sub-sample firms with dividend payout, thus ignoring the non-dividend paying firms. The study also repeats the analysis using firms "with pension fund ownership and paying dividend". The analysis allows further understanding of the relationship between pension funds and dividend payout among firms with pension fund ownership.

5.3.3 The Relationship Between Pension Fund Ownership and Dividend Per Book Value

Greinstein and Michaely (2005) suggest that institutional investors including pension funds have no influence on dividend policy. The current study examines the next hypothesis on whether a positive relationship exists between last year's pension fund ownership and this year's dividend payout. If institutional investors, including pension funds need dividend income, perhaps their position as major investors[167], combined with opportunities to meet the appropriate personnel of firms, allows them to exert an influence. The dependent variable in Equation (3.10) is now defined as level of dividend to book value. The purpose of the analysis is just to examine the relationship between previous year level of ownership and the current level of dividend payout. Further test on the causality effect between variables is discussed in the next section, where the dependent variable is defined as the changes in dividend to book value.

After 1997, the abolishment of tax credit given to tax-exempt investors, including pension funds, reduced the tax attractiveness[168]. The result presented earlier suggests that pension funds are not attracted to high dividends, thus the signaling role of dividends is not supported in this study. However, the study assumes that high dividend payout might still be preferred by pension funds (e.g., for prudence reasons) in the UK, even after 1997 tax changes and could be achieved by exerting pressure on management to increase dividend payout. Rationally, managers may wish to retain pension funds as investors if they believe that the presence of pension funds in their

[167] Institutions, such as pension funds are important investors in the UK market. ONS (2004) reports that around 80% of UK equity is held by financial institutions, primarily by insurance companies (17.2%), pension funds (15.7%) and overseas institutional investors (32.6%). ICAEM (2007) states that investors in the UK have more opportunities to have discussions with the managers of firms.

[168] Refer to Bell and Jenkinson (2002) and Hodgkinson (2002).

investor list and the higher pension fund ownership may signal positive information about the company to the market. The implication from this study is that, managers wishing to retain pension funds as investors should increase their dividend payout to retain institutional investment.

The results from the analysis (Table 5.6) suggest that there is an insignificantly positive relationship between last year's pension fund ownership and dividend payout. This model uses last year's ownership rather than current ownership due to an assumption that the decision to increase or decrease dividends might take more than one year to take effect considering the presence and influence of pension fund ownership. The initial result implies that pension fund ownership may not influence the dividend policy. However, the result shows significantly positive relationship between pension funds and dividend payout when the study repeats the analysis using only firms "with pension fund ownership and paying dividend". Contradictory to what has been reported by Greinstein and Michaely (2005) in his US study, the result implies that dividend policy might be influenced by pension funds investment even though it is limited to that sub-sample group of study. Greinstein and Michaely (2005) suggest that institutional ownership is not related to current dividend levels and concludes that institutional investors might not influence management to increase dividends. In contrast, there is a possibility of discussion between investors and the management of UK firms, which perhaps permits investors to influence management decision. Even though the positive relationship is proven in this study, the study cannot easily conclude that the pension funds do exert pressure to increase dividend payout. Equation (3.10) examines only the level of dividend payout instead of changes in dividend payout; thus, the causality effects between pension fund ownership and dividend payout, might not be established. Further tests are discussed in the next section to examine the possibility of pension funds influencing the firms' dividend policy.

Dividend policy is widely researched and size is among the factors influencing the setting of dividend policies. Lloyd, Jahera and Page (1985); and Vogt (1994) suggest firm size plays a role in explaining the dividend payout ratio of firms. They document that larger firms tend to be more mature and thus have easier access to the capital markets, which reduces their dependency on internally generated funding, allowing for higher dividend payout ratios. In the same way, Allen and Michaely (2004) provide evidence that firms with the highest dividend payout tend to be large, mature firms with lots of free cash flow and few growth opportunities. The result of the study however, shows that size is insignificantly related to dividends based on dividend paying firms. The significantly negative relationship is reported when the study repeats the analysis based on "firms with pension fund ownership and paying dividend" sub-sample. The contradictory result

reported in the current study might be due to sample selection in which non-dividend paying firms are ignored in the sample study.

As discussed earlier, Chang et al. (2012), in their survey suggest that managers perceive growth opportunities, low profitability and cash constraints might influence firms not to pay dividends. In line with that, the study shows that the coefficient for profit variable is significantly different from zero, suggesting that among dividend paying firms, higher dividends are reported among firms with higher profit. This is also in line with Aivazian and Booth (2003) who suggest the high profitability proxied by return on equity and high market-to-book ratio is related to high dividends whereas the higher debt corresponds to lower dividends. The ratio of debt to equity in the current study has a positive and significant relationship to dividend levels. This is surprising as a firm that is highly leveraged has more debt obligations and interest to pay. Jensen (1986) therefore suggests that debt could serve as a substitute for dividends in reducing agency problems. Zorn et al. (1992) and Chen et al. (1999) find that debt policy has a negative impact on dividend policy. Thus, the positive relationship between dividends and leverage reported by the current study does not comply with previous research.

In line with Aivazian and Booth (2003), growth proxied by market-to-book value is another variable that appears to be positively related to dividend to book value. Rozeff (1982) suggests that the dividend payout is a significantly negative function of the firm's past and expected future growth of sales. A study by Chen et al. (1999) also finds that the growth variable is negative and highly significantly related to dividend policy. La Porta et al. (2000) state that in countries with better protection for minority shareholders, fast growing firms tend to pay lower dividends than slow growth firms and suggest that legally protected shareholders are willing to wait for their dividends when there are lucrative investment opportunities available. Interestingly, contradictory to what is expected, both growth and leverage variables are significantly positively related to dividend payout. There is a possibility for firms with higher potential growth to pay more dividend payout for certain reasons and go for high leverage instead to finance their projects. The following section discusses the result of the hypotheses testing for the model in which dividend per share is a proxy for dividend payout.

Table 5.6: The effect of last year's pension fund ownership on this year's dividend to book value

This table reports the results of panel data regression analysis on the effect of last year's pension fund ownership on this year's dividend to book values:

$$Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\, it \quad (5.1)$$

	Full sample Dividend paying firms		Sample firms with pension fund ownership and paying dividend	
	Fixed effects Coefficient (standard errors)	Fixed effects Coefficient (robust cluster standard errors)	Fixed effects Coefficient (standard errors)	Fixed effects Coefficient (robust cluster standard errors)
Last year's dividend	0.427***	0.427***	0.407***	0.407***
	(0.010)	(0.024)	(0.013)	(0.038)
Last year's pension	0.046	0.046	0.092***	0.092***
fund ownership	(0.029)	(0.039)	(0.037)	(0.048)
Size	-0.052	-0.052	-0.157**	-0.157**
	(0.057)	(0.109)	(0.086)	(0.161)
Growth	0.336***	0.336***	0.394***	0.394***
	(0.016)	(0.058)	(0.026)	(0.079)
Profitability	0.017***	0.017***	0.020***	0.020***
	(0.002)	(0.005)	(0.002)	(0.007)
Liquidity	-0.095	-0.095	-0.155*	-0.155*
	(0.059)	(0.073)	(0.002)	(0.099)
Leverage	0.008***	0.008***	0.012***	0.012***
	(0.001)	(0.002)	(0.001)	(0.003)
Constant	2.808***	2.808***	3.339	3.339
	(0.293)	(0.478)	**(0.531)	***(0.894)
F	652.480	127.41	382.870	64.46
Number of observation	4830	4830	2718	2718
Sigma_u	2.359	2.359	2.793	2.793
Sigma_e	2.042	2.042	2.036	2.036
Rho	0.572	0.572	0.653	0.653
R2: within	0.522	0.522	0.5379	0.5379
R2:between	0.8684	0.8684	0.8216	0.8216
R:overall	0.7694	0.7694	0.7703	0.7703

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

5.3.4 The Relationship Between Pension Funds Ownership and Dividend Per Share

The study repeats the analysis using dividend per share to better understand the dividend policy set up at firm level and the result is summarised in Table 5.7. The result shows that the last year's pension fund ownership is insignificantly related to this year's dividend payout. The result is in similar direction with the one reported earlier. Again, this implies that the decision to increase or decrease firms' dividend payout is not affected by pension funds investment. The result is in line with Greisntein and Michaely (2005), suggesting dividends might not be influenced by institutional investment.

Alam and Hossein (2012) suggest that leverage, profitability and market capitalisation are positively related to the dividend rate, whereas liquidity and growth are negatively related to dividend rate in case of the UK based companies. On the other hand, they suggest that liquidity, leverage, profitability, and market capitalisation influence the dividend rate negatively, while growth affects dividend rate positively in the case of a Bangladeshi company. In line with that research, the current study finds a significantly positive relationship between profit proxied by return on equity and level of dividend. Dividend refers to a distribution of earnings to related shareholders. Accordingly, firms with higher profit have a tendency to pay higher dividend. However, when the study repeats the analysis using "firms with pension fund ownership and paying dividend" sub-sample, the profit variable is found to be insignificantly related to dividend payout.

The result also shows that the coefficient for size variable is significantly different from zero, thus suggesting that larger firms might pay higher dividends. The result is in line with a previous study reported by Tse (2005) in the UK market. The result is also in line with recent research by Rafique (2012) in the Pakistan market; he finds that firm's size has a significant relationship with dividend payout, whereas growth, profitability and leverage are insignificant. The study also shows that the other variables, growth, liquidity and leverage, are insignificantly related to dividend payout. The following section discusses the same hypothesis but using dividend to earning as a proxy for dividend payout.

Table 5.7: The effect of last year's pension fund ownership on this year's dividend per share

This table reports the results of panel data regression analysis on the effect of last year's pension fund ownership on this year's dividend per share:

$$Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\,it \quad (5.2)$$

	Full sample Dividend paying firms		Sample firms with pension fund ownership and paying dividend	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
Last year's dividend	0.594***	0.594***	0.642***	0.642***
	(0.013)	(0.067)	(0.018)	(0.019)
Prior year pension fund	-0.007	-0.007	-0.002	-0.002
ownership	(0.012	(0.009)	(0.014)	(0.004)
Size	0.131***	0.131**	0.078**	0.078***
	(0.023)	(0.051)	(0.032)	(0.027)
Growth	-0.024***	-0.024*	-0.037***	-0.037
	(0.007)	(0.012)	(0.009)	(0.023)
Profitability	0.008***	0.008*	0.009***	0.009
	(0.001)	(0.005)	(0.001)	(0.008)
Liquidity	0.001	0.001	0.023	0.023
	(0.024)	(0.019)	(0.032)	(0.022)
Debt to equity	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.001)
Constant	-0.560***	-0.560**	-0.427**	-0.427**
	(0.118)	(0.276)	(0.190)	(0.193)
F	322.870	322.870	202.950	6.59
Number of observation	4799.000	4799.000	2701	2701
Sigma_u	0.673	0.673	0.480	0.480
Sigma_e	0.827	0.827	0.743	0.743
Rho	0.398	0.398	0.294	0.294
R2: within	0.3521	0.3521	0.3832	0.3832
R2:between	0.8747	0.8747	0.9194	0.9194
R:overall	0.7153	0.7153	0.7689	0.7689

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

5.3.5 The Relationship Between Pension Funds Ownership and Dividend to Earnings

This section continues to test the relationship between pension fund ownership and dividend payout. The study now uses dividend to earnings as a proxy for dividend payout. The study uses only firms with positive earnings since the negative values of dividends are not applicable for this study; hence the sample of the firms is smaller. The study also runs the analysis using dividend paying firms sub-sample ignoring non-dividend paying firms and the result is summarised in Table 5.8. In this model, last year's pension fund ownership is again found to be insignificantly related to this year's dividend payout, thus implying that the management of the firm might not consider the pension funds investment in establishing their dividend policy.

Lloyd, Jahera and Page (1985); and Vogt (1994); Tse (2005) and Rafique (2012) find that firm size is positively related to dividend payout; while Gugler and Yurtoglu (2003) and Farinha (2003) show that dividend payout are negatively associated with firm size in Germany and in the UK. The current study also reports a significant negative association between size and dividend payout. The result suggests that the smaller the firms, the higher the tendency to pay higher dividends among the sub-sample of dividend payers. The profit variable is also evidenced to be significantly negatively related to dividend payout. Rationally, small firms with less profitable, may not be able to pay higher dividend. However, the result implies that the possible explanation is that the smaller and less profitable firms may use dividends as a signalling tool to attract potential investors or retain their investors.

From another perspective, the survey by Baker and Powell (2012), in their Indonesian study, suggests that the managers view the most important determinants of dividends to be the stability of earnings and the level of current and expected future earnings. Therefore, the current year profit applied in this study may not explain the dividend policy. In line with the previous result using dividend to book value as proxy for dividends, the growth and leverage variables are positively related to dividend policy. Similar to the argument made in the previous section, the possible explanation might be the higher growth firms have a tendency to signal through high dividends and rely on higher debt to fund their activities. The next

section discusses the result for the fifth hypothesis which questions whether pension funds have the ability to influence management to increase dividends.

Table 5.8: The effect of last year's pension fund ownership on this year's dividend to earning

This table reports the results of panel data regression analysis on the effects of last year's pension fund ownership on this year's dividend to earnings:

$$Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\,it \quad (5.3)$$

	Full sample Dividend paying firms		Sample firms with pension fund ownership and paying dividend	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)
Last year's dividend	0.274***	0.274***	0.253***	0.253***
	(0.015)	(0.021)	(0.019)	(0.026)
Last year's pension	-0.019***	-0.019	-0.281	-0.281
fund ownership	(0.231)	(0.247)	(0.285)	(0.341)
Size	-3.748***	-3.748***	-4.398***	-4.398***
	(0.405)	(0.525)	(0.561)	(0.692)
Growth	0.966***	0.966***	0.889***	0.889***
	(0.087)	(0.184)	(0.097)	(0.1695)
Profit	-0.580***	-0.580***	-0.522***	-0.522***
	(0.024)	(0.090)	(0.027)	(0.080)
Liquidity	0.504***	0.504***	0.193	0.193
	(0.224)	(0.154)	(0.675)	(0.834)
Leverage	0.064***	0.064***	0.082***	0.082***
	(0.006)	(0.008)	(0.008)	(0.01)
Constant	52.305***	52.305***	60.410***	60.410***
	(2.283)	(3.451)	(3.860)	(5.252)
F	169.47	61.34	98.900	55.88
Number of observation	3292	3292	1915	1915
Sigma_u	15.644	15.644	15.943	15.943
Sigma_e	11.900	11.900	11.260	11.260
Rho	0.633	0.633	0.667	0.667
R2: within	0.3054	0.3054	0.3112	0.3112
R2:between	0.064	0.064	0.0987	0.0987
R:overall	0.1301	0.1301	0.1312	0.1312

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

5.3.6 Does Pension Fund Ownership Precede an Increase in Dividend?

The last hypothesis is based on the assumption that pension funds prefer high dividends and the study then questions whether pension funds exert pressure on management to increase their dividend payout. Previous discussion shows that there is no relationship between pension funds and dividend payout based on the level of dividends proxied by dividend per share and dividend to earning. However, the result discussed earlier suggests that pension funds have a positive relationship with dividend policy proxied by dividend to book value for "firms with pension fund ownership and paying dividend" sub-sample. Previous model uses level of dividends instead of changes, thus the study might not establish the causality effect between the variables. Equation (3.11) uses the changes in dividends as dependent variable and the changes in pension fund ownership as independent variable to examine the causality effects among variables. Greinstein and Michaely (2005), as discussed earlier, does not provide any support to the idea of pension funds influencing a firm's dividend policy.

The following Table 5.9 summarises the comparative result of the model equation based on different definition of dividends. The result strongly rejects the fifth hypothesis, thus concluding that pension funds may not exert pressure to increase dividends. The size of the firms is matters since a significantly positive relationship is found in this study using dividend to book value and dividend per share as proxied for dividends. The result indicates that larger firms have a tendency to increase dividend. However, the study shows a significant negative relationship between size of the firms and dividend to earnings. This implies that, the smaller firms tend to positively change their dividend among firms with positive earnings. The signalling hypothesis suggests that firms pay dividend to signal the true worth of the firm. For smaller firms running at a loss, the signalling role of dividends is more useful. Since the sample only caters for firms with positive earnings, the result implies that the smaller firms with positive earnings may not necessarily increase dividends to attract investors.

A similar trend is applicable for the profit variable. While a positive relationship is found between profit and changes in dividends using dividend to book value, a negative relationship is evidenced when dividend to earning is proxied for dividend payout. The result implies that the lower profitability firms among firms with positive earnings have a tendency to increase their dividend payout.

The study again provides evidence that the higher growth and higher leverage firms have a tendency to positively change their dividend payout. The result is consistent with previous result discussed earlier. Basically, higher growth firms may need access to cash to expand their business plan; thus, it is reasonable to believe that a firm prefers to retain its profit rather than the profit being distributed as dividends. However, the study provides evidence suggesting that higher growth firms might continue to increase dividends. Interestingly, leverage is also found to be significantly related to dividend payout. Do they proceed with higher debt to fund their activities? The result may imply that the signalling role of dividends might still be applied.

Contradictory to what is expected the liquidity variable is found to be significantly negatively related to dividend payout. The result implies that firms with low current ratio have a tendency to increase their dividends. The result is in line with the UK study by Alam and Hossein (2012), which among others, suggests that liquidity and growth are negatively related to dividend rate in the case of the UK based companies. The following section summarise the finding of the study.

Table 5.9: The effect of changes in pension fund ownership due to changes in dividend

This table reports the results of panel data regression analysis on the changes in pension fund ownership due to changes in dividend:

$$\Delta Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 \Delta Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\, it \quad (5.4)$$

	Changes in dividend to book value		Changes in dividend per share		Changes in dividend to earnings	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects Coefficient (standard errors)	Fixed effects Coefficient (robust cluster standard errors)
Last year's dividend	-0.505***	-0.505***	-0.098***	-0.098*	-0.661***	-0.661***
	(0.008)	(0.042)	(0.004)	(0.053)	(0.015)	(0.023)
Last year's changes in pension	0.017	0.017	0.001	0.001	-0.124	-0.124
fund ownership	(0.015)	(0.011)	(0.001)	(0.001)	(0.122)	(0.089)
Size	0.308***	0.308***	0.014***	0.014**	-1.396***	-1.396***
	(0.039)	(0.057)	(0.002)	(0.005)	(0.404)	(0.528)
Growth	0.073***	0.073***	0.000	0.000	0.481***	0.481***
	(0.008)	(0.018)	(0.000)	(0.001)	(0.106)	(0.186)
Profit	0.003***	0.003***	0.000	0.000	-0.440***	-0.440***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.023)	(0.065)
Liquidity	-0.042*	-0.042**	0.000	0.000**	0.130	0.130
	(0.024)	(0.018)	(0.000)	(0.000)	(0.118)	(0.094)
Debt to equity	0.003***	0.003**	0.000***	0.000***	0.051***	0.051***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.006)	(0.008)
Constant	0.572***	0.572**	-0.041***	-0.041*	32.640***	32.640***

	Changes in dividend to book value		Changes in dividend per share		Changes in dividend to earnings	
	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects coefficient (standard errors)	Fixed effects coefficient (robust cluster standard errors)	Fixed effects Coefficient (standard errors)	Fixed effects Coefficient (robust cluster standard errors)
	(0.166)	(0.228)	(0.008)	(0.018)	(2.089)	(2.959)
F	588.99	588.99	83.58	5.84	314.35	314.35
Number of observation	7195	7195	7373	7373	3639	3639
Sigma_u	1.954	1.954	0.089	0.089	16.673	16.673
Sigma_e	1.972	1.972	0.107	0.107	12.383	12.383
Rho	0.495	0.495	0.404	0.404	0.644	0.644
R2: within	0.4021	0.4021	0.085	0.085	0.4318	0.4318
R2:between	0.3478	0.3478	0.0464	0.0464	0.0557	0.0557
R:overall	0.2484	0.2484	0.0726	0.0726	0.1591	0.1591

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively

5.3.7 Summary of the Findings

The fourth hypothesis, stated in alternative form, questions whether a positive relationship exists between last year's pension fund ownership and this year's dividend payout. Based on dividend paying firms sample, the result suggests for rejection of the fourth hypothesis, thus concluding that there is no relationship between pension funds and dividends. However, the relationship found to be significantly positive, when the study repeats the hypothesis using "pension fund ownership and paying dividend" sub-sample firms. However, the positive relationship is only found in the Model in which dividend to book value is a proxy for dividends. There is no significant relationship between pension fund ownership and the other two proxies of dividends (dividend per share and dividend to earnings). Focusing on dividend to book value, the result shows that the other variables, including growth, profit and leverage are found to be significantly positive to the dividend policy. However, size and liquidity variables of firms are not significantly related to dividends. Further analysis using sub-sample of firms "with pension fund ownership and paying dividends", suggests significantly negative relationship for both size and liquidity variables and dividend payout. The result shows that size and profit of the firms are found to be significantly related to dividend per share. In contrast, growth of the firms is significantly negatively related to dividend per share. While a positive relationship between profitability and dividend payout is evidenced using dividend to book value and dividend per share, a negative relationship is reported for profitability and dividend to earnings. The result may be influenced by the sample selection due to omission of firms with negative earnings.

The following test in this section examines the fifth hypothesis which questions whether firms increase dividends subsequent to pension funds investment. The results do not support the hypothesis, thus suggesting that pension funds may not influence the management decision for higher dividends. The implication of this analysis is that management wishing to attract or retain pension funds investment may not necessarily increase dividend payout. The following Table 5.10, Table 5.11 and Table 5.12 summarise the research findings discussed in this chapter:

Table 5.10: Comparison between expected and actual results on the effects of last year's pension fund ownership on this year's dividend based on dividend paying firm sample

This table reports the expected and actual results of panel data regression analysis on the effect of last year's pension fund ownership on this year's dividend:

$$Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\,it \quad (5.5)$$

Independent Variables	Proxy	Expected result	Sub-sample dividend paying firms		
		Regression analysis	Fixed effects	Fixed effects	Fixed effects
		Expected result	Actual result		
			dividend to book	dividend per share	dividend to earning
Last year's dividend	Last year's dividend	Positive	Positive***	Positive***	Positive***
Last year's pension fund ownership	Last year's pension fund ownership	Positive	Insignificant	insignificant	Insignificant
Size	Log market capital	Positive	Insignificant	Positive***	Negative***
Growth	Market to book ratio	Negative	Positive***	Negative*	Positive***
Profitability	Return on equity	Positive	Positive***	Positive*	Negative
Liquidity	Current ratio	Positive	Insignificant	Insignificant	Positive***
Leverage	Debt to equity	Negative	Positive***	Insignificant	Positive***

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively.

Table 5.11: Comparison between expected and actual results of the effects of last year's pension fund ownership on this year's dividend based on firms with pension funds and paying dividends sample

This table reports the expected and actual results of panel data regression analysis on the effects of last year's pension fund ownership on this year's dividend based on firms with pension funds and paying dividends sample:

$$Divit = \beta o + \beta 1 Divi(t\text{-}1) + \beta 2 Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\,it \quad (5.6)$$

Independent Variables	Proxy	Expected result	Sub-sample firms with pension fund ownership and paying dividends		
			Fixed effects	Fixed effects	Fixed effects
			Actual result		
			dividend to book	dividend per share	dividend to earning
Last year's dividend	Last year's dividend	Positive	Positive***	Positive***	Positive***
Last year's pension fund ownership	Last year's pension fund ownership	Positive	Positive***	insignificant	Insignificant
Size	Log market capital	Positive	Negative***	Positive***	Negative***
Growth	Market to book ratio	Negative	Positive***	Insignificant	Positive***
Profitability	Return on equity	Positive	Positive***	Insignificant	Negative***
Liquidity	Current ratio	Positive	Negative*	Insignificant	Insignificant
Leverage	Debt to equity	Negative	Positive***	Insignificant	Positive***

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively.

Table 5.12: Comparison between expected and actual results in pension fund ownership due to changes in dividend

This table reports the expected and actual results of panel data regression analysis on the effects of changes in pension fund ownership due to changes in dividend:

$$\Delta Divit = \beta o + \beta 1\, Divi(t\text{-}1) + \beta 2 \Delta Pfowni(t\text{-}1) + \beta 3 Sizeit + \beta 4 Growthit + \beta 5 Profitit + \beta 6 Liquidityit + \beta 7 Levit + e\, it \quad (5.7)$$

Independent variable	Proxy	Expected result	Actual result Fixed effects (changes in dividend to book)	Actual result Fixed effects (changes in dividend to book)	Actual result Fixed effects (changes in dividend to book)
Last year's dividend	Last year's dividend	Negative	Negative***	Negative***	Negative***
Last year's changes in pension fund ownership	Last year's changes in pension fund ownership	Positive	Insignificant	Insignificant	Insignificant
Size	Log market capital	Positive	Positive***	Positive***	Negative***
Growth	Market to book ratio	Negative	Positive***	Insignificant	Positive***
Profitability	Return on equity	Positive	Positive***	Insignificant	Negative***
Liquidity	Current ratio	Positive	Negative**	Positive**	Insignificant
Leverage	Debt to equity	Negative	Positive**	Positive***	Positive***

Note: The symbols*, ** and *** denote significance levels at the 10%, 5% and 1% respectively.

Chapter 6 : Summary and Conclusion, Limitations and Future Research

6.1 Introduction

Institutional investment practice is an interesting topic to study. Pension funds have been argued as being one of the major influential investors in the UK market[169]. This study therefore, looks at the UK market to understand the relationship between dividends and institutional investors, specifically, pension funds. This study examines the relationship between dividends and pension fund ownerships using a sample of non-financial firms listed on the London Stock Exchange for the period of March 1997 to December 2008. It is interesting to explore the pension funds investment practice in the UK since the tax reform in 1997. Prior to 1997, pension funds in the UK had a tax advantage due to the tax credit accompanying dividends given to tax-exempt institutional investors. After the tax changes in 1997, the abolishment of tax credit given to tax-exempt investors, including pension funds reduced the tax attractiveness of dividends. Therefore, a point worth investigating in this study is to see whether a similar pattern exists in the UK market with regards to investment practice by institutional investors such as pension funds, after the tax changes in 1997.

In order to attract investment from institutional investors, the management might wish to choose suitable signalling tools to effectively deliver a message about their firm's true worth. Previous studies[170] show that dividends might play a signalling role in this respect. However, the mixed findings question whether dividend payout are still useful to signal firm information. There is conflicting evidence as to whether dividends act as signalling tools and whether pension funds tend to invest in high dividend paying stocks. If dividends signal the true worth of the firm, they may well attract pension funds to invest in stocks. However, if dividends do not play a signalling role, pension funds might use other information to make their investment decisions. The results reported in this study however, do not support the signalling role of dividends. However, the policy of a stable increases in dividend is found to be significantly positively related to level and changes in pension fund ownership. In line

[169] The Hampel Report (1998) states that about 60% of shares in listed UK companies are held by institutions such as pension funds, insurance companies, unit and investment trusts. The ONS (2004) reports that institutions are important investors in the UK market, as around 80% of UK equity is held by financial institutions, primarily insurance companies (17.2%), pension funds (15.7%) and overseas institutional investors (32.6%).

[170] For example, John and William (1985); Miller and Rock (1985); and Ambarish, John, and William (1987) suggest that managers use dividends to signal a firm's future prospects (profitability).

with what has been expected given the tax credits available to pension funds prior to July 1997, this study finds that for the period prior to 1997, pension funds tend to invest in firms with higher dividend payout compared to a low dividend payout. The result however, is limited to a short period, thus limiting the generalisation of the results.

Some studies argue that institutions prefer dividends, regardless of whether they act as a signalling tool and any tax bias, as they need cash flow on an ongoing basis to fund their activities. Even though signalling through higher dividends is not proven in this study, the role of dividend still matters. The study provides strong evidence suggesting that the stable increases in dividend per share for five consecutive years may attract pension funds investment. The implication is that, the management wishing to attract pension funds investment, may not necessarily have to pay or retain higher dividends but may have to follow stable increases in dividend.

This study also questions whether pension funds invest in companies in which they can exert pressure to increase dividend payout. Currently, there is no conclusive evidence in the UK market with regards to institutional investors influencing firms' dividend policies. Therefore, this study contributes to the knowledge about whether pension funds have the ability to influence a firm's dividend policy. The study provides evidence on the positive relationship between last year's pension fund ownership and this year's dividend to book value for only sub-sample firms "with pension fund ownership and paying dividends". However, further tests on the changes in dividend suggest that pension funds in the UK market have no possibility to exert pressure on management of the firms to increase dividend payout.

The current study adds to the literature on the role of institutional investors, including pension funds, and provides an insight into potential explanations for how firms pay and change their payouts over time in the UK market. This study focuses on the relationship between pension funds and dividend payout and it is divided into six phases. The first phase describes the research questions, objectives of the thesis and the motivation for the thesis. The second phase provides a review of the related literature including the roles of dividend signalling and institutional investors. The third phase formulates testable hypotheses and provides discussion on the research methods. The study uses ownership model, to test the first, second, and third hypothesis, whereas the dividend model is used to test the fourth and

fifth hypothesis. The fourth and fifth phases discuss the results of the study and the final phase concludes the study.

This final chapter is organised as follows: Section 6.2 provides the overview of the main results and conclusion; Section 6.3 discusses the implications of the study; Section 6.4 clarifies the limitations of the study; and Section 6.5 provides opportunities for future research.

6.2 Overview of the Main Results and Conclusion

The current study provides a descriptive analysis on the sample distribution and the results suggest that the majority of the firms in the sample are the dividend paying firms. Generally, dividend paying firms, tend to comprise firms with pension fund ownership more than those without, except for March 1997. In contrast, the non-dividend paying sample firms tend to comprise more firms that do not have pension funds as owners. To investigate whether distributions of categorical variables in dividend paying firms and non-dividend paying firms are different from one another, the study provides a chi-square (X^2) statistic. The result shows that there is strong evidence that pension funds invest in dividend rather than non-dividend paying firms.

The study discusses two approaches. Firstly, the firm's dividend policy may be set up based on the assumption that dividends act as a signalling tool for a firm to disseminate its information to investors. This happens when managers believe that institutional investors, including pension funds, may invest in certain firms if they believe dividends signal the true worth of the firm. In this situation, pension funds might be considered as recipients of managerial decision making. Secondly, if they are not referring to dividend information for investment decision, perhaps they are in a position to influence decision making. In short, the study examines whether pension funds are: (1) recipients of managerial decision making; or (2) in a position to influence decision making.

Initially, the current study assumed that pension funds may use dividends as a signalling tool for their investment decision. Even if the role of dividend signalling is not applied in this study, high dividend payout might still be preferred by pension funds for tax or prudence reasons, and could be achieved by exerting pressure on management to increase dividend payout after investment. The first hypothesis, stated in alternative form, examines

whether a positive relationship exists between last year's dividend payout and this year's pension fund ownership. To better understand the nature of pension funds investment, the study performs the bi-variate analysis. Firstly, the study examines whether pension funds tend to invest in dividend paying firms and the result suggests that pension funds are likely to invest in dividend paying firms as both t-test and non-parametric test provide evidence of the difference between the paying and non-paying firm groups. A similar test is carried out to examine whether pension funds tend to invest in high or low-dividend paying firms. The result suggests that pension funds are likely to invest in lower dividend paying firms compared to higher dividend paying firms. The study also repeats the same analysis for stable and non-stable increases in dividend groups. The result suggests that pension funds are likely to invest in stable increases in dividend compared to non-stable increase in dividend.

To test the first hypothesis, the study uses level of dividends as a dependent variable. The study runs the analysis with two different sample firms. By using, the full sample period prior and post 1997, the result shows insignificant relationship between last year's levels of dividend yield and this year's pension fund ownership. A similar result is reported when the study repeats the analysis using dividend to book value and also for post 1997 period. However, when the study repeats the analysis using "dividend paying firms with pension fund ownership" sub-sample, the result provides weak evidence on the significantly negative relationship between last year's dividends and this year's pension fund ownership. The result is in line with what is reported by Greinstein and Michaely (2005) as they suggest that institutional investors might not influence management to increase dividends.

The current study questions whether pension funds look for stable increases in dividends apart or instead of high dividend. The study defines the stable increases in dividend as firms which continuously increase dividend per share for five consecutive years. The result from the analysis suggests that the stable increases in dividend is significantly related to pension fund ownership for both samples. The implication of this result is that firms should also focus on the stable increase in dividends in establishing their dividend policy to attract or to retain pension funds investment.

The abolishment of tax credits given to tax-exempt investors in 1997 reduced the attractiveness of dividends for institutional investors, including pension funds. Bell and Jenkinson (2002) suggest the incentive for pension funds to invest in high dividend paying companies should have been greater prior to July 1997, and hence, the relationship between

dividends and pension fund ownership was expected to be stronger in the period prior to the 1997 tax changes[171]. In line with what has been expected, the pension fund ownership is significantly related to dividends for prior to 1997 tax changes period. However, this finding might be debatable due to the relatively small sample available before the tax changes.

To test the second hypothesis, the study runs the analysis using changes in pension fund ownership. The result from the analysis suggests for rejection of the second hypothesis, thus concluding that dividend payout may not influence the decision to increase the investment by pension funds. However, the role of dividends is still significant since the result for all sub-sample firms strongly suggests that the stable increases in dividend is significantly related to pension funds investment practice.

Assuming pension funds prefer high dividends, this study then questions whether pension funds exert pressure on management to increase their dividend payout. The fourth hypothesis, stated in alternative form, questions whether a positive relationship exist between last year's pension fund ownership and this year's dividend payout. The study firstly runs the analysis based on dividend paying firms sample; the result suggests for rejection of the fourth hypothesis, thus concluding that there is no relationship between pension fund ownership and dividends. However, the relationship is found to be significantly positive, when the study repeats the analysis using "with pension fund ownership and paying dividend" sub-sample firms. The positive relationship is only found in the model in which dividend to book value is a proxy for dividends. There is no significant relationship between pension fund ownership and the other two proxies of dividends (dividend per share and dividend to earnings).

The result shows that the other variables, including growth, profit and leverage are found to be significantly positive to dividend policy based on dividend to book value. However, size and liquidity of firms are not significantly related to dividends. Further analysis using sub-sample of firms "with pension fund ownership and paying dividends", suggests significantly negatively relationship for both size and liquidity variables and dividend to book values. The result shows that size and profit of the firms are found to be significantly related to dividend per share. In contrast, growth of the firms is significantly and negatively related to dividend per share. While a positive relationship between profitability and dividend payout is evidenced using dividend to book and dividend per share, a negative

[171] Refer Bell and Jenkinson (2002) and Hodgkinson (2002).

relationship is reported for profitability and dividend to earnings. The result may be influenced by the sample selection due to omission of firms with negative earnings.

The result on the fifth hypothesis suggests that pension funds may not influence the management decision for higher dividends. The implication of this analysis is that management wishing to attract or retain pension funds investment may not necessarily increase dividend payments. The following section discusses the implications of the study.

6.3 Implications of the Study

The findings of this study should be of interest to regulators of markets with similar investment rules and to pension funds participants. Based on the UK market, pension funds are not looking for higher dividends but might prefer a policy of stable increases in dividend for five consecutive years. The result implies that whilst pension funds may not require dividend payout for their investment purposes, they do expect stable increases in dividend if a firm does pay dividends; and are likely to increase their ownership when firms begin to follow a policy of stable increases in dividend payout. The implication from the finding is that the management team of the respective firms should also consider this factor in setting up their dividend policy. Perhaps, management wishing to attract pension funds need not necessarily choose high dividend payout but set up a policy of stable increases in dividend.

The current study also suggests that the signalling role of dividends might still matter in the UK market, especially after 1997 tax changes. Instead of higher dividends, firms might signal the true worth of the firm by establishing their firm as stable increases in dividend firms. On the other hand, there is a possibility of dividends' signalling role in the UK market. The result of the study shows that firms with higher growth opportunities and more leverage are the firms which increase their dividends. The question to ponder here is whether the firms purposely pay higher dividends and go for external resources to fund their projects. If this is the case, the signalling role of dividends might still matter in the UK market.

The beneficial taxation of dividends for pension funds was reduced when the tax credits available to pension funds prior to July 1997 were removed. This study finds pension funds tend to invest in firms with higher dividend payout rather than lower dividend payout for the period prior to 1997. The regulators, including the Tax Authorities may look at the effect of the tax changes, especially to tax exempt investors, including pension funds. Even if

the pension funds are not looking for higher dividends, they still prefer dividend paying firms and the reason might be related to prudent investment or to fund their liabilities.

Overall, the study provides insights into potential explanations for the role of dividend policy in attracting pension fund investors, and for the relationship between pension funds and dividend payout in the UK.

6.4 Limitations of the Study

Several factors may limit the usefulness of the findings of the study. While the study finds sufficient data to conduct this research, data availability is still a concern. Firstly, Thomson One Banker tracks[172] ownership correctly if the firm files it on time. Unfortunately, the study may miss some pension funds investors in the calculation of pension fund ownership in case a firm does not file it on time. Secondly, there is a missing value for certain variables for few firms provided by Thomson One Banker. Due to that, the study had to omit the related firms from the sample firms. The study includes only firms in which all data is available. Accordingly, some firms were excluded from the sample selection due to missing data, as reported by Thomson One Banker[173].

Apart from the above problems, the finding may be limited due to the fact that pension funds investment practices are sometimes subject to pressure. Therefore, this will affect their judgement for investment purposes. Davis (2000) states that pension funds are often subject to pressures to invest according to non-financial objectives, for example, in local infrastructure projects (see Clark 1999). The current study does not include this factor in the analysis.

Another issue is the delegation of power for investment purposes. According to Ian (2002), the trustees of relatively large pension funds typically delegate the management of the

[172] Basically, Thomson One Banker tracks ownership up to 0.015% of the outstanding shares and if the holding of an investor is less than that, then it does not track it[172]. The threshold differs from one country to another and 0.015% threshold is applicable to UK stocks only. In short, pension funds holding less than 0.015% might not be included in the calculation of total pension funds ownership. However, their exclusion may be assumed not to affect the current study since small ownership is unlikely to impact dividend policy.

[173] One of the reasons for the missing data is due to changes in firms' accounting year. For illustration, if the firm year-end is initially 31 September 2000 and subsequently changed to 31 December 2001; in this situation, Thomson One Banker will provide the value of the data as "N/A" (not applicable). There are a few more reasons why the current study has to omit such firms from the sample.

pension funds' portfolio to fund managers. These fund managers may be in-house, employed directly by the pension funds, or the management may be out-sourced to an external fund management house. To monitor their performance, pension funds and fund managers are often evaluated according to a benchmark[174].Therefore, the pension funds investment may be related to benchmark requirements. Additionally, previous studies report that institutional investors rely on investor analysts for their portfolio selection. Unfortunately, this study does not include this factor on the assumption that the analysts' decision represents pension funds trustees' decision.

The results provided by the study on the tax effects on dividends prior to 1997 tax changes period is too short for a study on dividends, hence limiting the generalisation of the study. Besides, the study runs panel fixed effects regression analysis. Even though the fixed effects regression analysis provides the best estimation, it is less efficient, thus limiting the generalisation to the whole population. Although the application of the results is limited, the study still provides better understanding of the pension funds investment practice and dividend payout specifically in UK Market.

Share repurchases as discussed in Chapter Two is one of the alternative forms of payouts. The differences between share repurchases and dividend due to a few reasons, including the tax advantage of repurchases over dividends. Some might argues that payment of dividends might be preferred by managers to distribute the firm's permanent cash flows, while firms possibly use share repurchases to pay out temporary cash flows[175]. Some might suggest that managers are in favour of share repurchases because of the flexibility they offer in both timing of their release in the equity market and in deciding on the amount of the payout in conjunction with investment and financing decisions[176]. The current study however, does not consider the effect of share repurchases, thus limit the generalisation of the study. The abolition of tax credit in July 1997 directly involved tax exempt investors, including pension funds where they can no more enjoy the benefit of taxation after that period. Therefore, the result from the analysis might still be useful to look at the current practice of dividend payout in relation to pension fund ownership.

[174] Also refer Kay (2012).
[175] Refer Jaganathan et al. (2000).
[176] Brav et al. (2005).

6.5 Opportunities for Further Research

The role of dividends is still significant, hence creating opportunities for future research. In the course of this thesis, the study finds several areas that have not been fully addressed by academic research, but would be worthy of further examination.

The management of pension funds investment rely mostly on trustees and pension funds managers. The issue here is that not only are pension funds managers agents but the trustees themselves are agents. This scenario creates an avenue for future research in a way that the conflict of interest between pension funds, trustees and pension funds managers may be researched. The survey and interview study might be possible with regards to pension funds investment to gain understanding of the process of managing the investments.

Future research can investigate whether the investment decisions by pension funds managers are subject to pressure that affects their judgement for investment purposes. Moreover, future research may include the issue of delegation of power as discussed earlier. According to Ian (2002), the trustees of relatively large pension funds typically delegate the management of the pension funds' portfolio to fund managers. Therefore, the performance of trustees and also fund managers indicates that pension funds investment objectives should be explored.

The performance of pension funds managers is basically based on benchmark. Therefore, the indirect effect is that the pension funds investment may be related to benchmark requirements. Therefore, a pension funds manager's performance and how it affects pension fund investment might be an interesting issue to be included in understanding pension funds investment.

Appendixes

Appendix (1)

The Illustration of the Imputation Tax Systems

Kay and King (1990) provide illustration of the imputation tax systems as follow:

"Let say a shareholder who receives an annual dividend of £100, which, with the corporation tax rate set at 35%, requires £154 of pre-tax profits to finance the dividend payment. The £54 which is paid to the Inland Revenue is treated as both corporation tax for the company and a pre-payment of income tax at the basic rate (25% in this example) for the shareholder. The £100 dividend is, therefore, treated as if its notional pre-tax value were £133, with the shareholder having paid £33 income tax at the basic rate. The shareholder's tax liability is calculated on the basis of the gross dividend of £133, but he is given a tax credit of £33 which offsets the tax due on the gross dividend if tax is paid at the basic rate. In practice, capital gains tax is only levied when capital gains are realised: paper profits are tax free. The payment of tax credits was abolished in July 1997. If the shareholder is a higher rate tax payer then an additional sum will have to be paid to the Inland Revenue. If, however, the shareholder is exempt from income tax then the Inland Revenue refunds the £33 tax credit.

This provides an incentive for tax exempt investors to prefer dividends to retentions. Moreover, this incentive will not be eliminated even after allowing for the tax timing, indexation and deferral elements of the capital gains tax regime which lower its effective rate. These factors will produce, at the limit, an effective tax rate of zero on capital gains, whereas the tax credit on dividend income provided by the imputation system results in a *negative* overall tax rate on dividends for those institutions which are tax-exempt. This can be illustrated in the context of the above example by considering that the £54 corporation tax has to be paid regardless of the firm's dividend policy. If the remaining £100 is retained within the firm, then a tax-exempt investor will obtain an equivalent capital gain. However, if the same investor receives the £100 in the form of a dividend, then it will be accompanied by a tax credit of £33 from the Inland Revenue, effectively turning the post-tax profit of £100 into £133".

Appendix (2)

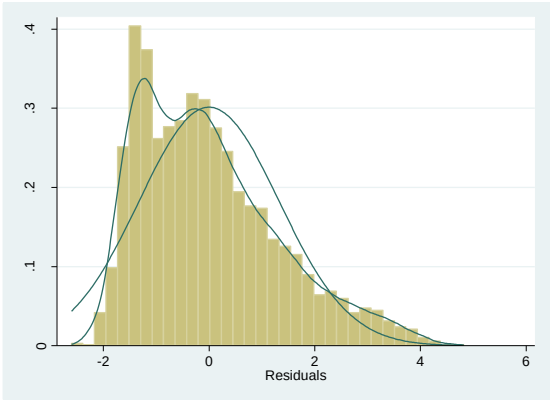
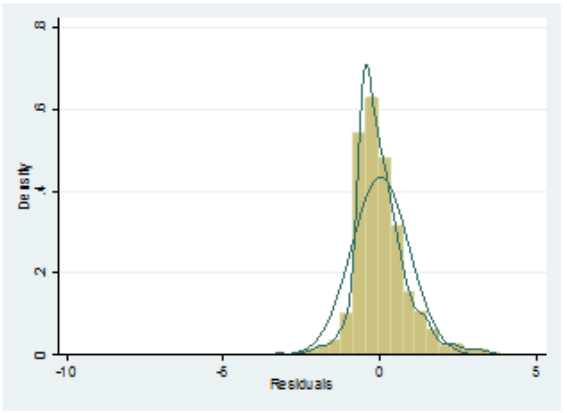
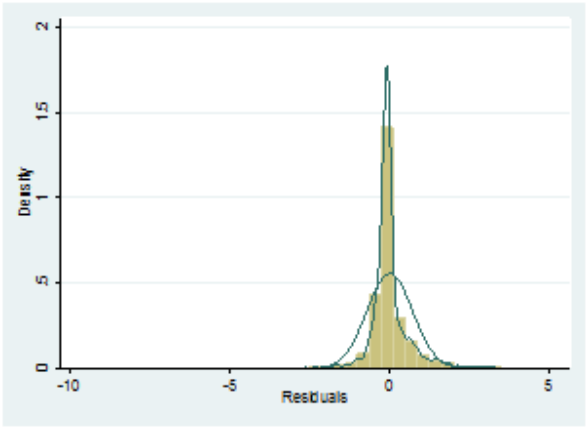
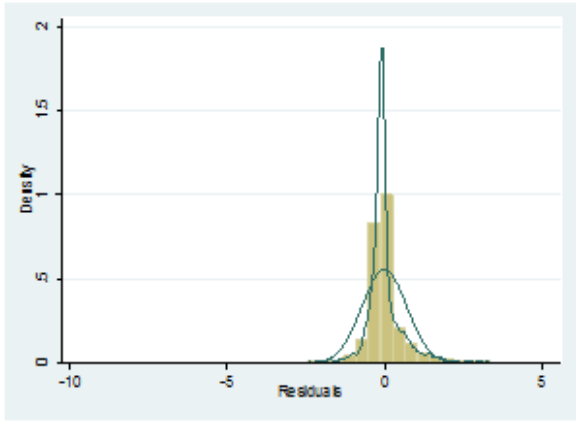
Chi-square Distribution Table (χ^2 vs P value)

The following is the chi-square distribution table. The P-value is the probability of observing a test statistic at least as extreme in a chi-square distribution. Accordingly, since the cumulative distribution function (CDF) for the appropriate degrees of freedom (df) gives the probability of having obtained a value less extreme than this point, subtracting the CDF value from 1 gives the P-value. The table below gives a number of P-values matching to χ^2 for the first 10 degrees of freedom. A P-value of 0.05 or less is usually regarded as statistically significant.

Degrees of freedom *(df)*	χ^2 value										
1	0.004	0.02	0.06	0.15	0.46	1.07	1.64	2.71	3.84	6.64	10.83
2	0.1	0.21	0.45	0.71	1.39	2.41	3.22	4.6	5.99	9.21	13.82
3	0.35	0.58	1.01	1.42	2.37	3.66	4.64	6.25	7.82	11.34	16.27
4	0.71	1.06	1.65	2.2	3.36	4.88	5.99	7.78	9.49	13.28	18.47
5	1.14	1.61	2.34	3	4.35	6.06	7.29	9.24	11.07	15.09	20.52
6	1.63	2.2	3.07	3.83	5.35	7.23	8.56	10.64	12.59	16.81	22.46
7	2.17	2.83	3.82	4.67	6.35	8.38	9.8	12.02	14.07	18.48	24.32
8	2.73	3.49	4.59	5.53	7.34	9.52	11.03	13.36	15.51	20.09	26.12
9	3.32	4.17	5.38	6.39	8.34	10.66	12.24	14.68	16.92	21.67	27.88
10	3.94	4.86	6.18	7.27	9.34	11.78	13.44	15.99	18.31	23.21	29.59
P value (Probability)	0.95	0.9	0.8	0.7	0.5	0.3	0.2	0.1	0.05	0.01	0.001
	Non significant								**Significant**		

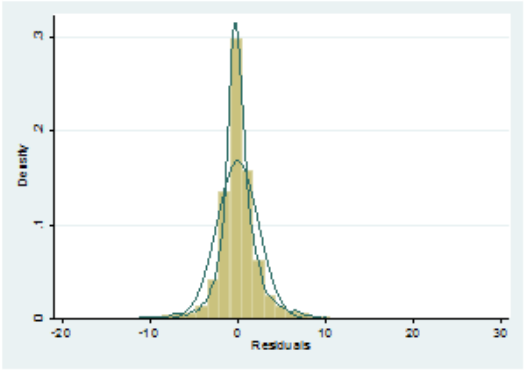
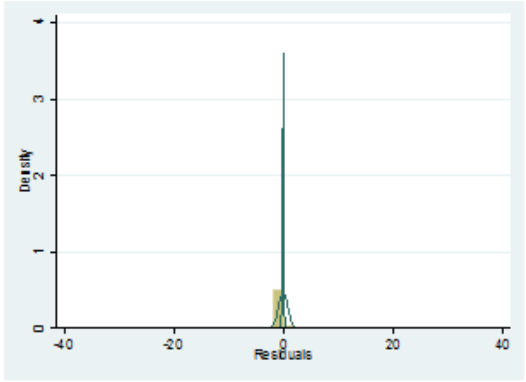
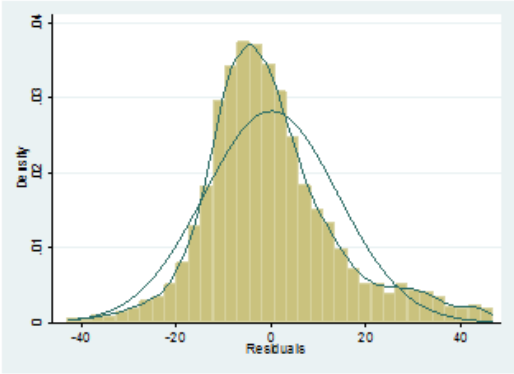
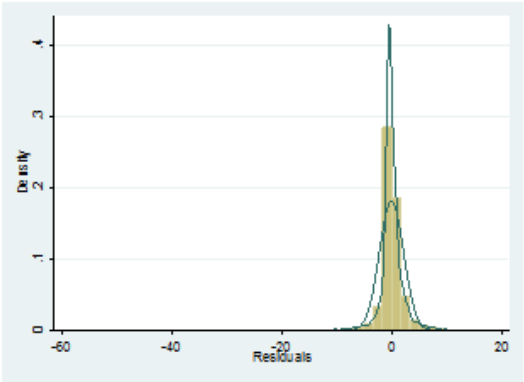
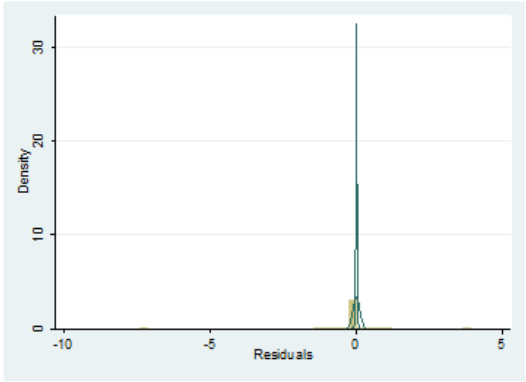
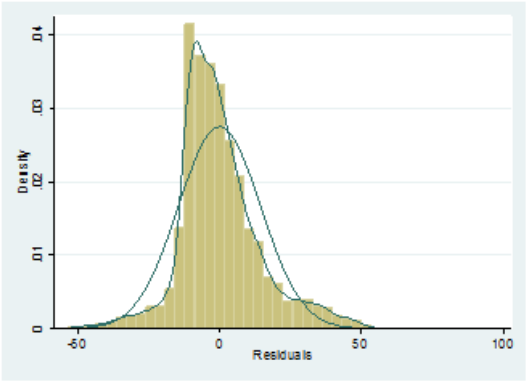
Appendix (3)

The following is the graph for test of normal distribution of residual for Equation (3.1); (3.2); and (3.3)

	Dividend yield (n=3062)	Dividend to book value (n=2912)
Equation (3.1) and (3.2) where independent variables include last year's dividend		
	Changes in dividend yield (n=2828)	Changes in dividend to book value (n=2416)
Equation 3.3 where independent variables include last year's changes in dividend		

Appendix (4)

The following is the graph for test of normal distribution of residual for Equation (3.10) and Equation (3.11)

	Dividend to book value (n=4830)	Dividend per share (n=4799)	Dividend to earnings (n=3292)
Equation (3.10) where dependent variables is dividend payout			
	Changes in dividend to book value (n=7195)	Changes in dividend per share (n=7373)	Changes in dividend to earnings(n=3639)
Equation (3.11) where dependent variables is a changes in dividend payout			

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