Determinants of Corporate Dividend Policy in the UK market

by

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Abstract

This paper examines the determinants of dividend policy for listed companies on the UK market. Since the numerous empirical studies in the US market, UK market is similar but also different from US. In order to examine the determinants of dividend policy, this study introduces a static panel data model for testing six hypotheses as six factors to the dividends payout within period 1990 and 2007. Those factors are represented as the main theories on the dividends and share repurchases. The results indicate that return on assets; market-to-book ratio, debt-equity ratio and tax issue are negatively related to the dividend payout, whereas market capitalization of common equity is positively correlated. Earnings per share do not explain the dividends in advance. Consequently, this study provide in understanding the inherent characteristics and the determinants of dividend policy.

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Table of Contents

Lists of Figures and Tables

Figures

Tables

Chapter 1

Introduction

The capital budgeting, the capital structure and the payout decisions are the three most important strategic decisions that should be concerned by the financial management for a company. More specifically, payout policy is on the list of the top ten unresolved issue in the modern corporate finance. Its difficulty is not only because of the simplex paid dividends, but also the share repurchases as another important policy, or the complicated factors and theories applied to both of them in different firms under different countries. The fact that firms pay dividends is referred to as the dividend puzzle by Black (1976). Early 1960s, Miller and Modigliani (1961) provide an "dividends irrelevance" with a perfect capital market in the world, then many researchers have been investigate, argue and prove this argument based on the empirical evidences, past literatures, and suggesting new models and different results. Go with the "dividend irrelevance" argument, another new argument emerged – share repurchases. it has been very popular in the recent years, especially, dividends were treated less favorable than share repurchases in the US. Managers should payout by dividends and buy back shares solely or both has been the second popular researched topic in determining dividend policy. There are already number of the famous theoretical explanations focus on the different range of firms and market characteristics for determining the dividend policy during past half century. In general, the empirical works on the dividend policy has been mainly focused on the developed

stock markets rather than developing stock market- UK or US market. The reason is probably that in developing market the range of firms and market characteristics are likely to be exaggerated than developed market (Al-Malkawi, 2007). The main purpose of this paper is focusing on the number of theories in determining the dividends in the UK market.

Both US and UK has the same market-based corporate governance system. There is vast number of companies listed in the both markets and comparing to other developing market. Both are under an active, canonical and soundly corporate control. The outside investors and firms' shareholders are well protected under a common law system (La Porta et al., 1999). The reason for targeted on the UK market in this study is because that there already have numerous researches investigate the determinants of dividend policy in US market. However, not many of them are interested in the UK market. As known that the US firms are less prone to generate excess funds and paying high level of dividends to shareholders, where dividends is substituted inchmeal by the share repurchases (Grullon and Michaely, 2002). Differently, past researches suggests that UK firms do not have a decreasing trends in paying dividends. Fama and French (2001) have concluded the time trend in cash dividends. They found that between 1978 and 1999, the decline in the proportion of firms paying dividends almost matches the growth in the proportion that have never paid. In fact, the majority of UK firms are likely to pay dividends to shareholders. I

suspect that the discrepancy is probably the differences in the tax system between two countries. However, "the existence of tax clienteles can not fully explain the difference in patterns" (Renneboog and Trojanowski, 2005).

In this study, I will investigate the determinants of dividends payout on the number of listed companies in the UK stock market within a long time period. It not only seeks to add some empirical literatures by providing a detailed analysis of dividends payout, but also through comparing theories with share repurchases to observe how different between them in the UK. The paper uses a firm-level panel data set of listed firms on the UK market between 1990 and 2007, where firms are limited by number of restrictions. I will introduce six hypotheses, which are based on the main theories of dividends payout that concluded from other studies. Not all hypotheses are suit for model, hence, I use a method as adding each variable to the simple model and then examining the R^2 (it represents the proportion of the variation in the dependent variable) to deduct the unnecessary hypothesis. A static pane model will be used in this paper as a tool to investigate the determinants of dividends payout. This model supports the results with determining which hypothesis is not same as predicted and which factors are the most important issues to the dividends payout.

The remainder of the paper is organized as follows. Section 2 provides the short discussion of dividend policy and share repurchases theories along with major

past empirical literature review, evidence and background for dividend policy. Section 3 develops the hypotheses and variable selections, while data, model and methodology are described in section 4 and 5. Section 6 reports the results with analysis of the payout policy, interpreting the variables and regression separately. The section 7 is about the limitation in this research and the final section is to summarize analysis and conclude findings.

Chapter 2

Literature Review

2.1. Introduction

This chapter offers the brief introduction to the dividend and share repurchases, and some important issues in both areas. In addition, there will have the in-depth review of the theories on the dividends and share repurchases based on the citation of textbooks, academic journals, and other articles, where taxation is the most important issue. Hence the UK tax system will be briefly introduced.

2.2 Dividends

Dividends have been considered for publicly traded firms to return cash or asset to their stockholders over three centuries ago. Many financial and business historians have suggest that the dividend policy has been bound up with the historical development of the corporation (Al-Malkawi, 2007). Lintner (1956) provided the first empirical study of dividend policy, who interviewed corporate managers by over 600 American listed companies and 28 for detailed investigation. The survey was summarized in three "facts": Firstly, Lintner claimed out that the firms have long-run target payout ratios, whereby mature companies with stable earnings have high pay out. Secondly, long-term and sustainable earning changes are likely to affect the payout. Finally, managers prefer the stable dividends. They though the changes in dividend is much more important than the level of dividends. By concerning the changes in dividends, Lintner developed a simple model, while the dividend target change equals to

the difference between target dividend payout this year and last year and multiply by speed of adjustment rate, where the dividend payment equals the target payout ratio (target payout ratio is the proportion of earnings that pays out in dividend) multiply by the earnings per share. This model indicates "The more conservative the company, the more slowly it would move toward its target and, therefore, the lower would be its adjustment rate" (Brealey and Myers, 2006). Other researchers examined the different models to get the similar result as Lintner, such as Fama and Babiak (1968) and Fama (1974). However, Bond and Mougoue (1991) reconsider the Lintner's model and conclude that the Lintner results are not unique.

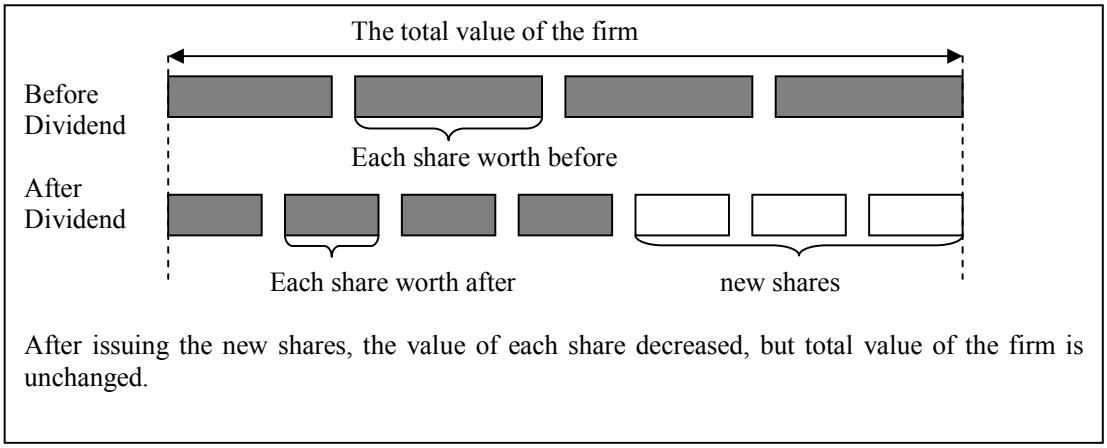
2.2.1 Irrelevance Proposition

Dividend policy has provoked much controversy over the years in the field of corporate finance. The major controversy is whether firm's value is influenced by the choice of dividend policy.

"The higher dividends payout, the higher firm value" was the initial belief for corporations until a school of thoughts came out: dividend irrelevance. Miller and Modigliani (1961, hereafter M&M) first pointed out the company pays in dividends is irrelevant to the firm value. Their view is the perfect market view, which shows that under certain assumptions including under a perfect capital market, rational investors, to fix a firm's investment program with fixed borrowing (market value of a firm is independent of its dividend policy) and also assumes that the future market value will not affected by the current dividends,

which means that the only way is to finance the cash payment for dividends by issuing new shares and leads to reduce the share price but without change the level of total return to stockholders (Figure 1.) (the value of share outstanding before dividend distribution will decrease by the exactly amount of the dividends paid, and the value of the new shares equals the amount of the dividend distribution, thus the level of stockholders return unaffected as well as the value of the firm is unchanged after the dividend distribution (Emery and Finnerty, 1991)). As a result, it has been found that it is not dividend's business and M&M's perfect capital market assumptions has often formed the basis for the emergence of rival theories of dividend policy (Al-Malkawi, 2007).

Figure 1.



After issuing the new shares, the value of each share decreased, but total value of the firm is unchanged.

As seen from figure, for the old stockholders, the value of the each share decreased, it seems that they suffer a capital loss. However, as long as the efficient capital market, they can raise the cash by selling the shares. Therefore, the old shareholders can cash in either by requiring high dividend payment or

selling shares (Brealey and Myers, 2006).

As mentioned before, MM theory relies on the perfect market view leaves no taxes, transaction costs and information asymmetries. Considering the shareholders' return, the taxation is an important issue. Because cash dividend will reduce the shareholder's capital gain, if there is no tax advantage or disadvantage associated with dividend, investors would not care about to receive returns in dividends or capital gains. In consequence, the dividend policy is irrelevant in perfect markets. Black and Scholes (1974) provided an empirical study for the effects of dividends on stock price which is a strong argument for the irrelevance theory. They concluded that there are no significant relations between dividends and stock prices. In other words, even market imperfections exists, the low or high dividend yield would not affect the share prices.

2.2.2 Market Imperfections

In reality, the market is uncertain and risky of capital gain exists. For example, managers can stabilize dividend but can not control the stock price. As long as the investment and borrowing changing, the future cash flow of the firm is uncertain, hence, dividend is likely to be chosen to retained earnings. To many unrealistic assumptions in MM theory makes economists thinking if the market imperfections exist, is the dividend policy relevant to the firm value? It can rational forward to the second school of thought: relevant. For instance, Damodaran (1997) claimed out if there is a tax disadvantage for the investors,

and then dividends are taxed more heavily than capital gains. This leads to the investors to prefer firms with low dividend payouts (the tax-preference theory). In other words, investors should accept higher pre-tax adjusted return with high dividend yield or lower pre-tax rate of return from securities offering returns in the form of capital gains rather than dividends (Brealey et al., 2006). The low dividends payout ratio can reduce the required rate of return and increase the market valuation of firm's stocks. Hence, firms pay high level of dividends decrease the firm value and reduce the level of stockholders return after taxation.

2.2.3 Clientele Effects

Tax clientele effects is related to the tax-preference theory, while if he dividend income is taxed at a higher rate than capital gains, high tax payer investors (or clienteles) prefer non-dividend or low dividend paying stocks. In other words, capital gains will be the main way in which the shareholders receive a return. There are vast studies on the clientele effects in the past years, however, the findings are mixed (Al-Malkawi, 2007), such as Pettit (1977), Scholz (1992), and Dhaliwal et al. (1999) all supports the evidences for the clientele effects.

By relaxing the M&M's assumptions and appealing to market imperfections, the dividend policy is not only related to the tax clientele effects hypothesis, but also signaling hypothesis in the presence of information asymmetry (Bhattacharya,1979; Miller and Rock, 1985), agency costs (Easterbrook, 1984) and also transaction costs (Fama, 1974). All of these are going to be discuss in

the following go with the theories for share repurchases.

2.3 Share Repurchases

At the earlier time of 1960s, the comprehensive share repurchases analysis based on the New York Stock Exchange firms came out and the study pointed out that the share repurchases has been a extraordinary factor in the stock market (Guthart, 1966). Rau and Vermaelen (2002) noticed that during 1985 to 1999, share repurchases were particularly accepted and many firms have been earned positive abnormal returns in the long-term. Hence, the growth in the share repurchases has been much more than the dividends in the last twenty years in US. Especially, many industry firms are likely to spent more money on share but backs (Grullon and Michaely, 2002).

The explanations of repurchase have focused primarily on two widely-accepted hypotheses: Information-signaling hypotheses and free cash flow hypotheses (Table 1). Various studies test the explanation of positive market reaction to share repurchases in these two hypotheses. The most of studies are on the tender offers, whereas the empirical evidence in the open market share repurchases is less, because of the uncertain repurchase volumes and timing (Dann, 1981; Howe et al., 1992; Perfect et al., 1995).

Table 1.

Impact of repurchases on	Free cash flow	Information signaling
Profitability		Better than expected
Equity risk	Lower growth phase	Unrecognized growth opportunity
Capital expenditures	Limited investment opportunities	
Cash reserves	Reduce financial slack	

Comparing the profitability, capital expenditures, cash reserves, and equity risk of firms after share repurchases to distinguish between the information-signaling and free cash flow hypotheses.

The most popular explanation is information-signaling hypothesis. Vermaelen (1981) expressed the signaling and information in the share repurchases by examining the price behavior of the firms which buy back own shares. The results show that the share repurchases as a positive signal to the commonalty and as well as price securities around the announcement date in the market. Firms buy back stock as a signal to the market that the share repurchases increased expected cash flow and companies' shares are undervalued (Dann, 1981; Vermaelen 1981; Hertzel and Jain, 1991; Ofer and Thakor, 1987; Constantinides and Grundy, 1989).

In contrast to the signaling theory, Stephens and Weibach (1998) and Ikenberry et al. (2000) are on the opposite side of signaling hypothesis. They

stated a "good investment" hypothesis which firms buy back shares because of the undervaluation shares. Moreover, they argue that incompletely announcement to the market. Stephens and Weibach (1998) gathered a sample of 450 open market share buy backs announcements in US between 181 and 1990. They found a negative relationship between share repurchase and share price after announcement, indicating that firms buy back stock when stock price will be undervalued. Moreover, they also confirmed the free cash flow hypothesis.

The based studies on the free cash flow hypothesis are not as many as signaling. It is not surprising that there are conflicts of interest existing among the shareholders and managers over payout policies, especially focusing on the free cash flow. Free cash flow is how much cash or cash flow left after all positive net present value project are undertaken. Jensen (1986) argues that repurchase acts as a takeover deterrent and an alternative hypothesis came out: free cash flow hypothesis. By examining takeovers in US oil industry, he claims out that management did not pay out the excess resources to shareholders, hence while shareholders facing low prices, they are likely to sell their shares to outsider investors at higher prices.

Through examining 282 firms with fixed price and Dutch auction tender offers in US between 1978 and 1991, Nohel and Tarhan (1998) states that the positive market reaction to share repurchases is better explained by free cash flow hypothesis.

In addition, Grullon and Michaely (2004) found that consistent with free cash flow hypothesis, the positive market reaction to share repurchase is likely more positive among the over-investment firms, where concluded that the repurchases reduce over-investment. However, agency cost with share repurchases is not suitable in the open market by the reason of that in the open market, firms do not have incumbency to distribute excess cash.

Stephens and Weisbach (1998) as mentioned before, they examine the managers in open-market program in the US and found that the managers are more likely to repurchase shares actively if they have high expected and unexpected cash flows.

Other explanations are personal tax saving hypothesis, leverage, and the efficient using of funds. As mentioned before, the share repurchases have tax advantages, thus beneficial for investors. As the clear-cut relationship theory by Black and Scholes (1974), Litzenberger and Ramaswany (1979) constructed a fresh model for a 42 year study which presented that differential tax rates have the significant effect on the investor preference to dividends or capital gains. However, Shoven (1989) argues that the share repurchase did not became unpopular after the abolished the differential taxation between dividends and capital gains in the US.

2.3.1 UK Repurchase Regulations

Understanding fully UK repurchases regulations will help to better interpret dividends and share repurchases. The share repurchases was legalized in the UK in 1981 (1981 Companies Act). Because of the development of the UK law system, tax system and others, share repurchases activity is restricted and stricter than US in three categories: repurchase legislation, the authority, and the disclosure of repurchases activity (Table 2).

Table 2.Comparing the share repurchases regulation in the US and UK market

	UK market	US market
Repurchase authority	Shareholders	Board of directors
Repurchase intention announcement	• Firm's declaration • Board's proposal • Shareholders' resolution	Board's intention
Repurchase execution announcement	By 7:30 am after execution	None

Firstly, UK firms are required to have articles of association permitting repurchases and a special resolution conferring repurchase authority which is obtained by 75% majority shareholders voting at a meeting before repurchasing. Differently, the repurchase authority in US is in board of

directors' hands which is much more convenient than UK firms (Espenlaub et al,).

Secondly, according to the Listing Rules of the London Stock Exchange (LSE), firms are required to notify the Company Announcement Office (CAO[1]) of the repurchase execution in order to repurchase. Furthermore, LSE is also required that the 15% or more of the companies share capital have to be created by the tender offer within 12 month (ibid). Repurchase execution announcements are better than intention announcements, where Stephens and Weisbach (1998) supporting this statement by examining 450 US repurchase intention announcements in nine years time. The result shows that approximately 10% firms bought less or no shares.

Thirdly, UK and US both has the similar regulation on the protecting creditors from the reducing the firm's capital. UK 1981 Companies Act states that "only 'distributable profits' or the proceeds of a fresh issue of shares (made for the purpose of the purchase) can be used to finance the purchases" (Rau and Vermaelen, 2002).

Last but not least, before 1st December 2003, all UK firms are required to cancel all repurchased shares and resale at treasury stock is also not permitted

[1] The CAO was owned by Regulatory News Service (RNS) and operated by the LSE. In 2001, the Financial Services Authority (FSA) moved to a competitive model for company announcements. The CAO now refers to primary information provider services (PIP services) approved by the FSA to distribute regulatory announcements. The RNS is one of the PIP services.

(Oswald and Young, 2004). In contrast, firms in US are allowed to repurchase shares and can be reissued without shareholder approval.

2.4 Theories on Dividends and Share Repurchase

Financial economists have been investigated the relations between dividends and share repurchases for a long time. The existing empirical literatures have many explanations for the "dividend puzzle" (Black, 1976) that even the taxation on the dividends is higher than the share repurchases, companies still preferred to pay out cash in dividends rather than share repurchases. The explanations for the puzzle are also the factors that influence the corporate managers in determining the firm's dividend policy, including taxes, overinvestment, transaction costs, information asymmetric, undervaluation.

2.4.1 Taxation

2.4.1.1 Overview of UK Tax System in Business

UK companies are facing number of different types of taxes, where corporation tax is the principal UK tax on companies. Corporation tax is a tax on the profits made by UK-resident companies and unincorporated associations, the non-UK resident companies and associations which trade in the UK and hold a permanent establishment is also taxed (Adam and Browne, 2006). Corporation tax started since 1965 by Finance Act. Companies are required working out their own tax liability and paying it at the last day of the annual accounting period. Generally, the tax rates are depending on the profits level. At present, there are two main corporation tax rates: the small companies' rate and the

main rate. Because company's profit level might change between the two rates, marginal relief is available to ease the transition (Table 3[2]).

Table 3.

Profits	Rate applied	Rate payable on profits earned from 1st April 2008
Up to £300,000	Small companies' rate	21%
Between £300,001 and £1,500,000	Marginal relief from main rate	Between 21% and 28%
Over £1,500,000	Main rate	28%

Initially, in 1965, the Labour government claimed out that the additional profits which distribute in the form of dividends will also charge income tax. In such circumstance, the tax on dividends is the marginal rate of income tax of the shareholder with no allowance after corporation tax. A tax reform in 1984 and in 1997, Labour government changed the way of taxing dividend, where "no longer allowing certain tax-exempt shareholders, such as pension funds and other companies, to reclaim the value of their dividend tax credit" (Adam and Browne, 2006) and the corporation tax reduced. Before 1986, there was a significant difference between dividends and capital gains, where capital gains tax (CGT[3]) is much lower. In 2008-2009, the CGT is 18% for individuals, trustees and personal representatives. Furthermore, the dividend income

[2] Source: Inland Revenue http://www.hmrc.gov.uk/rates/corp.htm on the date of 17th August 2008

[3] The data downloaded from http://www.direct.gov.uk/en/MoneyTaxAndBenefits/Taxes/BeginnersGuideToTax/DG_4016313 on the date of 17th August 2008

decides the tax rate on dividends by dividend income[4] (10% dividend ordinary rate if dividend income is below £34,800; if over £34,800, 32.5% dividend upper rate).

In order to reduce the double taxation on distributed profits, a partial imputation system was introduced in 1973 in the UK. Under the system, company does not have to pay tax at the time it pay dividend. Shareholder receives net cash dividends and the credit for taxes paid by the companies on distributed profits and the shareholder's income tax liability will also be offset, where the tax credit is equal to the basic tax rate of income tax on dividends (Short et al., 2002).

This system gives an incentive for company to issue new shares and use the proceeds to pay dividends as much as they can. Concerning transaction costs against the tax advantage, the new share issues might not effective to the investment. However, under this system, companies make use of issuing new shares to either reduce transaction costs or binding dividend constraints, which lead to the higher dividend payments for investors, especially a low risk, consistent and high dividend paying stock for small investors (Benito and Young, 2001). Consequently, the partial imputation tax system is much more favorable than in the classical tax system in terms of tax treatment of dividend and double taxation (Bond et al., 1996; Bank, 2004).

[4] The data downloaded from: http://www.direct.gov.uk/en/MoneyTaxAndBenefits/Taxes/TaxOnSavingsAndInvestments/DG_4016453 on the date of 17th August 2008

The partial imputation tax system was realized by two mechanisms of Advance Corporation Tax (ACT) and tax credits. ACT is one of the methods that UK firms pay to the Inland Revenue when the dividend is paid out, which is assessed by the amount distributed to shareholders by dividends or share repurchases, is equal to multiply the gross dividend by the imputation rate. Tax reform in 1997 supports the tax exempt shareholders/investors could claim cash refund of tax credits from Inland Revenue. Tax credit benefits to the basic rate taxpayers who have no further tax liability, whereas tax credit could not cover all income tax ability for the top rate taxpayers who are required to pay the difference.

Another method is mainstream corporation tax, is paid approximately nine months after the end of accounting period. ACT could be offset against mainstream tax, is approximately 20% of company's taxable profits, and hence reduces the double taxation. However, when company is unable to offset the ACT against the taxation on profits, surplus ACT occurred. Surplus ACT represents a real cost (such as timing cost) associated with cash paid to shareholders. In other words, surplus ACT represents an increased tax cost on UK companies of distributing surplus cash to shareholders.

Majority companies in a surplus ACT position are because of cash flow problem. The actual gains or losses can not be reflected exactly in the taxable profits or suddenly changed in the tax rate might influence the profits of the companies. Hence, companies with less profit, less pay out dividends. More serious situation is where the ACT could not be offset against the mainstream tax

permanent. This requires the companies to revise their business structure and dividend payout policy.

When dividends are taxed more heavily than capital gains, high-payout company is required to sell the shares at a lower price in order to provide the same after-tax return as low-payout. However, if the tax rate on the dividends is higher than capital gains, individual shareholders expect the companies to use retained profits for the reason of personal tax liabilities. Otherwise, they would reinvest in the lightly-taxed capital gains. Therefore, not only has corporation tax related to the dividend policy, but also personal tax on the shareholders.

2.4.1.2 Taxation on Dividends and Share Repurchases

The best way to observe the tax issue on dividends in the UK is to observe the patterns of payout in the US. Not only US and UK, but also most countries have different tax treatment on the different types of income. UK is currently under the imputation system, however, US has a classical company tax system. In such tax system, the shareholders are taxed separately from companies (Short et al., 2002). Hence, the dividends are taxed twice. The first is the corporation tax on the firm's profits, and then is the income tax on the shareholders' dividend income. Hence, whether in basic rate or high rate, the tax liability on both shareholders and firms lead to that they prefer retained profits rather than dividends pay out. Oppositely, UK is under the partial imputation system, as mentioned before, in order to reduce the double taxation in both shareholders

and companies, part of the corporation tax payment on companies is taken into account in the income tax on dividends of shareholder (Renneboog and Trojanowski, 2006).

In contrast, the UK has used a partial imputation system since 1973. In that system, part of the firm's payment of corporation tax is taken into account when calculating a shareholder's liability to income tax on dividends. Hence, the tax treatment of dividends is more favorable than in a classical tax system (Bond et al., 1996; Bank, 2004). Consequently, tax-exempt shareholders prefer dividends to retained earnings; corporations and basic rate taxpayers are neutral with respect to dividends and retentions, whilst only the highest tax-bracket investors prefer retentions to dividends (Bell and Jenkinson, 2002; Short et al., 2002). For example, a UK corporation pays out £100 dividend to shareholders, which has to pay ACT on this dividend at a basic rate of 20% and 25% as corporation tax rate. In other words, shareholders receive "gross dividend" of 100 (1-25%) (1-m)/ (1-20%) after company tax and personal income tax m[5]. when the ACT can be offset against mainstream tax. therefore, taxation of dividends is taxed differently on the basic rate and top rate of personal income tax.

Capital gains for UK corporations are subject to corporation tax at the normal rate with no annual exemption (corporation tax rates has been mentioned

[5] Income tax in 2008-09: £0-£34,800 per year taxed at a basic rate of 20%, Over £34,800 taxed at a higher rate of 40% ,
Source:
http://www.bytestart.co.uk/content/taxlegal/9_15/income-tax-allowances-2008-9.shtml on the date of 17th August 2008

before), calculated according to modified CGT rules. Even though the UK's CGT rules have a simple core, the tax treatment of share repurchases is much more complicated and has been changed at various points in time by the reason of that there are many special exemptions, regulations and conditions under the UK imputation system.

2.4.2 Overinvestment

The overinvestment indicates that the managers over investing in the projects, especially the negative net present value projects and without concern shareholders wealth or interests in the first place. Black (1976) argues that paying dividends could helps firms to reduce the amount of free cash flow and thus to ease the potential overinvestment problem. Differently, Easterbrook (1984) argues that the reason for the dividends can mitigate the overinvestment problem is that to pay dividends more, firms can go to equity market to raise more additional capital. Firms can not only attract new equity in the market, but also can monitor and practice themselves, therefore, the transaction costs, especially timing cost is reduced.

Furthermore, Grullon and Michaely (2004) finds that consistent with free cash flow hypothesis, the positive market reaction to share repurchase is likely more positive among the over-investment firms and concludes that the repurchases reduce over-investment because the free cash flow is reduced. Dittmar (2000) argues that firms are more likely to repurchase shares if they have large amounts of cash or cash flows. It seems that there is an indirect relationship:

large amount of cash flow represents the overinvestment; firms has large amount of cash flow, then they buy back more shares. Hence, overinvestment affects share repurchases positively. However, Grullon and Michaely (2004) also argues that agency cost with share repurchases is not suitable in the open market by the reason of that in the open market, firms do not have incumbency to distribute excess cash.

2.4.3 Transaction Costs

Dong et al (2005) test a sample of 2723 householder members with 555 unable responses from members who hold or recently held common shares and investment funds. The result indicates that the low transaction costs are the reason why individuals like dividends. They find that many investors deem the transaction costs will be lower if they reinvest dividends in different security. In the mean time, they believe the dividend-paying stocks are much more risky.

Easterbrook (1984) argues that when firms go to equity market frequently, at the time of paying dividends, they not only attract new equity in the market, but also monitor and practice themselves. Therefore, the transaction costs, especially timing cost are reduced. In addition, Rozeff (1982) also argues that the agency costs of external equity can be reduced by dividend payments. In contrast, on the company level, Jong et al. (2003) argues that "if the companies pay dividends and at the same time attract new equity, substantial transaction costs are being made". Share repurchases is also suit in this argument.

Standing on the stockholders side, they are likely steady income from stock, so they have the "choice between buying dividend paying stocks and cashing in the dividends, and buying non-dividend paying stocks and regularly selling a part of their portfolio" (Jong et al., 2003). Jong et al. (2003) claims that transaction costs seems particular important to the small investors, where the transaction costs of cashing in dividends is less than in the selling pat of stocks.

2.4.4 Information Asymmetric

Despite the tax penalty on dividends relative to capital gains, firms may pay dividends to signal their future prospects. This explanation is known as the information content of dividends or signaling hypothesis. Signaling hypothesis is presence of information asymmetry. Information asymmetry deals with the situation where one party has relevant information in the process of making decision, and others do not have. Hence, two or more parties are in an unequal position.

Firstly, some studies claim the most popular explanations for dividend behavior is information asymmetry between managers (insiders) and shareholders (outside investors). Where managers have private information for the current performance and future fortunes of the firm, it is not easy known by the shareholders. According to signaling models (Bhattacharya, 1979; Kose and Williams, 1985; Miller and Rock, 1985), the private information can help managers to make the payout decisions and therefore can be used as a signal for share price reacting. According to that the share prices change after the

dividend change announcement, insiders and outsiders can determine the information content of dividend changes and how the future profitability will be (Bhattacharya, 1979; Aharony and Swary, 1980; Miller and Rock, 1985; John and Williams, 1985; Bernheim and Adam, 1995).

Traditional dividend signaling models state the idea that the high dividends have the low level of information asymmetry. For example, Myers and Majluf (1984) suggest that the firm can reduce underinvestment by decreasing dividends, where the underinvestment arises when the firm has high level of information asymmetry. This implies that a higher level of information asymmetry leads to the underinvestment. Thus, low dividends occurred. However, Khang and King (2006) bring forward a different view. They used insider returns as a proxy for information asymmetry to measure the relationship between the dividends and information asymmetry. The result found the dividends are negative related to insider returns. Hence, high level of information asymmetry (low insider returns) with high dividends.

Secondly, Brennan and Thakor (1990) offer a theory which does reply on the asymmetric information between firms and outside investors, but instead, they only examine that investors are informed about firm's activities. They notices that informed shareholders are very sensitive in the share repurchase price. If the repurchase price is too high, then they are likely to be left with a larger share of company. Oppositely, they will be with a smaller share of company. Hence, share repurchases is related with the "a redistribution of wealth

between informed and uninformed shareholders". Thus, shareholders might prefer dividends to share repurchases.

In addition, Deshmukh (2005) examines the relationship between asymmetric information and transaction costs and concludes that the transaction costs increase with the level of asymmetric information, and dividend has negative related with predicted transaction costs.

2.4.5 Agency Theory

The agency costs theory indicates that the information asymmetric problem can be reduced by dividend payment which is also to reduce the cash flow under the management control and therefore in order to mitigate the agency costs (Easterbrook, 1984). Thus, agency problems exist between managers and shareholders, while dividends play an important role. According to the La Porta et al. (1999), "the existing agency models have not yet fully dealt with the issues of choice between debt and equity in addressing agency problems, the choice between dividends and share repurchases, and the relationship between dividends and new share issues".

An important issue is that dividends as an outcome of legal protection of shareholders. This relates to the separation of ownership from control, while shareholders control part of companies' dividend policies to protect their

benefits and earnings. Managers face to the limited power on the investment decisions. Thus, the higher dividends payout ratios for protecting the shareholders in advance, but companies should have the lower dividends payout ratios in order to get better investment opportunities. Another issue is the substitute model that when firms are expected to raise external funds in order to be attractive, firm establish a reputation for moderation in expropriating shareholders through paying more dividends. In this situation, it eases the burden on the existing shareholders. There is a weak legal protection of minority shareholders. Consequently, high dividend payout ratios related to the weak legal protection of shareholders (La Porta et al., 1999).

2.4.6 Undervaluation of Shares

The undervaluation is based on the premise that the information asymmetry between managers and shareholders or investors, if managers believe that the firm is undervalued, they might repurchase their firm's stock to increase the long term value of shares. Hence, repurchasing stock seems as a signal to the market. Ikenberry et al (1995) confirmed this theory and they state that the undervalued shares represent a "good investment".

Chapter 3

Variables Selection and Research Hypotheses

This chapter is consisted by the explanations of dependent variables and independent variables, and six research hypotheses. Some theories in the previous chapter will be used by proxy as the independent variables in the model. However, since the data limitation of transaction costs and undervaluation of shares, they will not be included in the independent variables.

3.1 Dependent Variables

Payout ratio is used to measure the amount of earnings paid out in dividends to shareholders. It has been used as independent variables to measure firm's payout in many past studies. However, the payout ratio is not sufficient for the company which has negative net income. Low level of net income tends to have high payout ratio and if there is negative net income, the payout ratio will also be negative. In addition, numbers of sample firms have zero payout ratios during the time period. Since the sample firms contains different firm size, where the difference of dividends payment between firms will be the very fluctuated, dividend yield is better than amount of dividends in comparison and represents the actual dividends performance of the. As a result, in order to analyse on more sensible observations, dividend yield (DY) is used to measure dividend policy.

3.2 Independent Variables and Research Hypotheses

Many researchers have been used different factors to determine the dividend policy. For instance, Barclay et al. (1995) focus on the dividend policy in the industrial firms through determining the investment opportunity, regulation and size. In 2002, Casey et al. (2002) test dividend policy in banking firms and suggest that the investment opportunities, size, agency problems, dividends history and risk as the factors affecting dividend policy.

This research will examine the dividend policy in number of factors based on the above theories. However, it is not practical to insert the same number of factors into regression model, since limitation of data. For example, the business risk, free cash flow, transaction cost are not easy to obtain. Therefore, the some of them and the others can be substituted by different proxies.

Hypothesis 1: Dividends as a signal for firms' future actions

This hypothesis is to identify the relationship between information asymmetric and dividends payout. In the past studies, different proxies for the information asymmetry have been used (i.e. insiders return, insider holdings, shares trading volume, share turnover, firm size etc.). However, the data for these proxies are not available for most sample firms. Hence, in this research, I will use return on assets (ROA) as a proxy for information asymmetry (Renneboog and Trojanowski, 2005). Because ROA is referred to the return on investment, which supports an idea as to how efficient insiders are in using its assets and also the data on ROA is available for most sample firms. Consequently, if the

return on assets is higher, that is, with less information asymmetry this indicates the low dividends. Thus, there is an inverse relationship between ROA and dividends payout.

Hypothesis 2: Firm growth and investment opportunities are negatively associated with dividend payouts

Firms are not only for the purpose of external funds, but also generate internal funds to finance those investments for the firms with high growth and investment opportunities. Based on this issue, firms tend to pay less or no dividends to shareholders for retain more earnings or more liquid cash flows. Williamson (1981) used the difference between the market value of firm's debt and equity securities and the replacement cost if tangible assets as proxy for firm's intangibles and growth opportunities. Myers (1984) found that book values and market values both reflect (tangible assets and working capital, growth opportunities and assets-in-place. Hence, I expect the firm's growth and investment opportunities as measured by market to book ratio (MBR), where it has inverse relationship with dividends payout (Deshmukh, 2003).

Hypothesis 3: Dividends payout increases as the firm size increases

A large firm has less constraints than small firms, which can better access to the capital market and has advantage in the market to raise external funds with low costs, thus less internal funding for large firms. This indicates that the internal funding decreases as the firm size increases. Other things being equal, as the dividend payout ability increasing, the large firms are likely to pay high

dividend to shareholders. Therefore, the firm size has positive associated with dividends. Moreover, the large firms tend to be more prestigious than small firms which can support strong confidence for the existing shareholders and other investors. Generally, number of employees can stands for the firm size. However, the number can not directly used in the model. Hence, in this study, I will use the firm's market capitalization of common equity (MCAP) as proxy for firm size (see Al-Malkawi, 2007; Deshmukh, 2003**).**

Hypothesis 4: Financial Leverage is negative related to the dividend payout

Financial leverage is linked with the firm's debt which defines how well the firm utilizes borrowed money. A high level of financial leverage indicates that the firm is unable to cover its debt and also difficult to borrow money in the future. Rozeff (1982) state that the high level of financial leverage indicates that firm has low payout ratios which helps to reduce the high burden of transaction costs associated with external financing (Al-Malkawi, 2007). Thus, the financial leverage is referred to the debt-equity ratio (DER), which has a negative relationship, with the dividends, defined as the total liability divided by the total shareholders' equity.

Hypothesis 5: Profitability defined as positive related to the firm's dividend payouts

Profits are basically issue that concerned by managers with how much paid to the shareholders with dividends. In other words, the level of the profitability is

one of the most important factors to influence firm's dividend decisions (Al-Malkawi, 2007). Linter (1956) has claimed out that the firm's net earnings are critical important for determine the dividends changed over time, and not only Linter, but also Fama and French (2002) support a hypothesis to explain the positive relationship between profitability and dividends. Consequently, the firm with lower profits can not afford to pay high dividends. In contrast, the higher profitable firms are optimistic to pay dividends and which can generate more internal funds to finance more future investments. In order to test profitability, I will use earnings per share (EPS) as a proxy, which expected to have a positive relationship with dividends payout (Al-Malkawi, 2007). In addition, ROA in the hypothesis 1 can reflect the profitability of firm as well.

Hypothesis 6: Dividends payout has tax disadvantage induces firm to reduce dividends payout

As known that there was a tax reform in the UK market in 1997, in order to investigate how the dividends payout changed as the change in tax law, I introduced tax issues as a dummy variable (DTAX). Hence, the dummy variable takes only the value 0 for the pre-tax (1990-1996) and 1 for the post-tax (1997-2007). According to the higher tax rate on dividends, it is likely to have a inverse relationship between DTAX and dividends payout.

Chapter 4

Data and Sample Selection

It is unrealistic to select all, because of the extremely large the sample size and time consuming. Therefore, choosing the sample firms for this research is partly decided by what kinds of data are available. Even the share repurchases is a crucial sector in the payout policies, it has the limitation on the data collection in the UK market. Hence, I will only focus on the examining the dividends payout of the listed companies on the London Stock Exchange (LSE). The data employed in this study is derived from the DataStream and World scope dataset. DataStream is a wide-ranging database for financial and economic data of companies, and the updating data every day as far as 1970. The data is provided major by the following five organizations: Thomson Financial which is DataStream itself, International Monetary Fund (IMF), Organization for Economic Cooperation and Development (OECD), National governments and statistical offices and National Banks.

According to the DataStream database and list of LSE, there are over 1000 companies listed in the UK market. Banks, insurance companies, and other financial firms (SIC codes starting with 6) have the different financial reporting standards from other rest sample firms, hence, I exclude the firms with SIC codes starting with 6. In addition, the payout policies and the access to external financing of public utilities (SIC codes 4900-4949) are regulated, which has the different motives from other non-regulated firms. Thus, those public utilities are also excluded. Last but not least, the data for retained firms should be

available in the World scope dataset and DataStream within time period 1990-2007 (where there was tax reform in 1997). As a result, 133 firms are selected and represent a broad range of industries[6].

[6] The sample includes agricultural, mining, forestry, manufacturing, fishing and construction firms (SIC codes 1-4899), the retail and wholesale firms (SIC codes 5000-5999), and the service firms including accounting, engineering, advertising and financial services etc. (SIC codes 7000-8999).

Chapter 5

Model and Methodology

5.1 Lintner's Model

The technique of OLS (Ordinary Least Squares) regression is employed in order to confirm the variables used in the final model. According to the past several studies, many economists has been constructed various models with different factors to analyse dividend policy. Broadly speaking, they did concerning market imperfections, information asymmetric, agency costs, clientele effects, undervaluation, and so on. These seem immethodical issues. However, the main purpose is still legible.

Lintner (1956) was the first person to determine the dividend policy and conducted a simple model[7] in order to examine how the managers work with the dividend policy. He only inserts two parameters into model: the target payout ratio and the speed at which current dividends adjust to the target (DIV_1 = target ratio * EPS_1, which means the dividend payment in the ensuing year would equal a constant proportion of earnings per share). After Lintner's model, there has been various models to be conducted based on this model and little evidence that still use Lintner's model directly.

[7] $D_{it} - D_{it-1} = \alpha^*(TE_1 - D_0)$ where a = adjustment rate; T = target rate;D1 = current dividend; E1 = current earnings; and D0 = previous dividend.

5.2 Best-Fit Model

As seen from the Chapter 4, I introduced six hypotheses and set proxy variables for each hypothesis. Hence, these variables can be seen as the factors constitute a general model to be tested in order to determine that they are the factors influence the dividend policy. To choose between the competing hypotheses in order to get the best-fit model, I will examine the variables by adding each into a regression model gradually.

$$DY_{it} = \beta_0 + \beta_1 ROA_{it} + \varepsilon_{it} \quad (1)$$

$$DY_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 MBR_{it} + \varepsilon_{it} \quad (2)$$

$$DY_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 MBR_{it} + \beta_3 MCAP_{it} + \varepsilon_{it} \quad (3)$$

$$DY_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 MBR_{it} + \beta_3 MCAP_{it} + \beta_4 DER_{it} + \varepsilon_{it} \quad (4)$$

$$DY_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 MBR_{it} + \beta_3 MCAP_{it} + \beta_4 DER_{it} + \beta_5 EPS_{it} + \varepsilon_{it} \quad (5)$$

$$DY_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 MBR_{it} + \beta_3 MCAP_{it} + \beta_4 DER_{it} + \beta_5 DTAX_{it} + \varepsilon_{it} \quad (6)$$

Table 4.

Model 1	Coefficient	p-value	Model 2	Coefficient	p-value	Model 3	Coefficient	p-value
ROA	-0.116** (-12.79)	0.000	ROA	-0.080** (-8.75)	0.000	ROA	-0.082** (-8.94)	0.000
			MBR	-0.238** (-13.30)		MBR	-0.321** (-10.34)	0.000
						MCAP	0.071** (3,27)	0.001
R=0.1636, Adjusted R=0.1632			R=0.2276, Adjusted R=0.2269			R=0.2315 Adjusted R=0.2304		
Model 4	Coefficient	p-value	Model 5	Coefficient	p-value	Model 6	Coefficient	p-value
ROA	-0.071*** (50.56)	0.000	ROA	-0.071*** (-7.30)	0.000	ROA	-0.071*** (-7.38)	0.000
MBR	-0.363*** (-10.83)	0.000	MBR	-0.365*** (-10.87)	0.000	MBR	-0.359*** (-10.72)	0.000
MCAP	0.068*** (-3.29)	0.002	MCAP	0.071*** (3.27)	0.001	MCAP	0.0665*** (3.07)	0.002
DER	-0.149*** (-3.29)	0.001	DER	-0.114** (-2.04)	0.041	DER	-0.156*** (-3.44)	0.001
			EPS	0.039* (1.09)	0.277	DTAX	-0.239*** (-2.64)	0.008
R=0.2353 Adjusted R=0.2339			R=0.1358 Adjusted R=0.1340			R=0.2378 Adjusted R=0.2360		

Notes: t-statistics are in parentheses. *, ** and *** denotes the insignificant, significance level at 5, 1 percent, respectively.

Starting with the equation (1), according to the correlation matrix among dependent (DY) and independent variables (number of factors), the correlation between dividend payout (DY) and information asymmetric (ROA) is 0.2521 (Table 6). The ROA is in any model. Moreover, the equation's R^2 and adjusted R^2 both are approximately 16 percent (Table 4). R^2 Represents the proportion of the variation in the dependent variable and is explained by regression. Adding even a totally irrelevant independent variable can never reduce R^2, and will probably increase it. In other words, higher R^2 means better model. Somehow choosing the model with largest value of R^2 is

equivalent to choosing the model with the greatest number of regressors, thus R^2 is not helpful as a model selection aid, but it shows how well the regressors to explain the dependent variable.

In equation (1), R^2 is 0.1636, with adjusted R^2 of 0.1632. This indicates that the ROA can explain about 16 percent dividend payout, which is not too bad. According to the table, it shows that the ROA has a negative relationship with the dividend payout and statistically significant.

To find out a better-fit model, the MBR is added to the model and conducted equation (2), where the coefficient of MBR in table also shows that it has a inverse relationship with the dividend payout, and the R^2 is approximately 22 percent. It improves the fit of the equation. For equation (3), The proportion of variations of the dependent variation is about 23 percent (0.2315), which means the MCAP can fit the model a little bit as well and it has a positive relationship with dividends payout and statistically significant. In equation (4), DER is added to the model and according to the correlation with DY and coefficient; it has a negative and statically significant with dividend payout. As seen from table 4, R^2 for equation (4) is also approximately 0.2353. Hence, it will be kept for better-fit model. In equation (5), EPS is added. Although it has a negative relationship with dividend payout, the addition of growth rate does not improve the fit of the equation. The proportion of variations of the dependent variation which is explained by equation 5 is 0.1358, with adjusted R^2 of 0.1340. This means that there is less than 23 percent can be explained

by equation (5). Thus, EPS can be omitted from the model. Finally, DTAX is added to the equation. The coefficient of DTAX is negative and significant. The proportion of variations of the dependent variation which is explained by equation (6) is 0.2378, with adjusted R^2 of 0.2360. This means it can improve model a little bit. In consequence, the equation (6) gives the best-fit model for determine the dividends payout.

Real life data principally collected and recorded in three ways: cross-sectional data, time series data and panel data.

Pure cross-sectional data is simply defined as the different units observed at one point in time which gives cross-sectional an intuitionist idea that it ignores those variables in a long-term effects. In addition, cross-sectional regression is failure to take into account the endogeneity bias which might result from omitted variables bias, measurement errors, and simultaneity bias.

Pure time series data defined as the same unit observed over different time periods. This refers that some data has to be observed for a long time. However, this data is also unilateral and is difficult to discern the each variables' long term effects. In other words, data has time limitation.

Panel data is also called longitudinal data and defined as the different units observed over different time periods (combined cross-section and time series). It is more suitable and useful to determine the dividend policy in this case,

which sets both cross-sectional and time-series elements and data can either be balanced or unbalanced (different firms have different number of observations). Generally speaking, panel data supply more information, more variability, less collinearity among variables, more degrees of freedom and more efficiency. Moreover, individual heterogeneity is added into panel data model which refers to the fact that the individual firms are different, and can not be neglected for the better and unbiased results (Greene, 1993). Therefore, it is better to use panel data with a better techniques and theoretical results rather than use either cross-sectional or time series alone.

In the case of determining dividend policy, there are 133 sample firms (2412 observations) and examined time periods within 1990 and 2007. This is a large sample size and panel data can help to build a powerful significance tests. Furthermore, it is unavoidable that there are some mismeasured or unobserved variables for a large sample size to be conducted in a model, where panel data gives a better adjustment with containing both the firm-specific and time-specific. Hence, better results.

5.3 Modeling

As mentioned before, pooled model ignores individual heterogeneity (denoted as f_i, firms have persistent difference across time). Hence, there are biased estimates and invalid procedures. Such as in this case of dividends, the different firms have different managerial skills and decisions. Neglecting this heterogeneity can cause serious problems in econometric model. An error term

ε is added in order to captures this heterogeneity. When the individual heterogeneity term is uncorrelated with the regressor (endogeneity variables), is referred to as the random effect model. The random effect model is more efficient than the pooled model. However, if there is no individual heterogeneity, pooled model (OLS) is better. In addition, random effects model is best estimated by Generalized Least Squares (GLS) and GLS estimator is called random effects estimator.

Furthermore, the individual heterogeneity f_i is also called fixed effect or correlated effect. If the individual effects f_i and regressors are correlated, it is referred to choose fixed effect model which is sometimes referred to as the Least Squares Dummy Variable model. Greene (1993) states that the fixed-effects model is a reasonable approach when one can be confident that the differences between units can be viewed as parametric shifts of the regression function. The fixed-effects models are less attractive, if the differences between firms are not attributable to parametric shifts, but are more related to variation across firms in the regressors.

The generally a definitive method of choosing between fixed and random effects is running a Hausman test (Hausman 1978). The Hausman test statistic follows a Chi-square distribution with degrees of freedom equal to the number of regressor (Greene, 1993), which has a formula:

H= $(\beta_{FEM} - \beta_{REM})^{'} V^{-1} (\beta_{FEM} - \beta_{REM})$, where β_{FEM} is the fixed effects model estimator, β_{REM} is the random effects model estimator and V= $\beta_{FEM} - \beta_{REM}$.

As known, there is an individual heterogeneity in the panel data model. Statistically, fixed effects are always a reasonable model to do with panel data (the heterogeneity is constant over time, hence it can be removed from the data) but they may not be the most efficient model to run. Random effects assume that the individual effects are randomly distributed. If the random effect is also assumed to be constant over time, we can say that the random effect is a fixed effect. Thus, a fixed effects model is a special random effects model. As a result, random effects model is a more efficient model and supply an efficient estimator than fixed. this is determined by giving a better P-value than fixed.

In addition, the hausman test checks the results based on the results of random and fixed effects model to make sure that the random effects model also has a consistent results. The test statistic of hausman test is asymptotically distributed as chi-square under the null hypothesis that the correlation between the stochastic error term and explanatory variables is null. The hausman test tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as or close to the ones estimated by the consistent fixed effects estimator. Hence the random effects model is more suitable compared to the fixed effects model.

5.4 Methodology

Through the above model estimation and modeling statement, the null hypothesis is that the all variables do not have significant influences on the

dividend payout.

The model to be estimated using the panel data model with the fixed and random effects, for firm *i* in period *t* and measure impact on dividend payout as dividend yield (DY) can be written as:

$$DY_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 MBR_{it} + \beta_3 MCAP_{it} + \beta_4 DER_{it} + \beta_5 DTAX_{it} + f_i + \varepsilon_{it} \quad (7)$$

Where f_i is firm heterogeneity and ε is error term, the dependent and independent variables are defined in the table 5 which contains the summary of the research hypotheses and predicted relationship. Time effects dummy variable DTAX will be added later.

Table 5: Summary of Research Hypotheses and Proxy Variables

Explanatory Variables	**Proxies for Explanatory Variables**	**Predicted Relationship with Dividend Payout**
H_1: Signal	Return on Asset (proxy for information asymmetry)	Negative
H_2: Investment opportunities	MBR: market-to-book ratio	Negative
H_3: Size	MCAP: natural log of market capitalization	Positive
H_4: Financial Leverage	DER: debt-to-equity Ratio (total liabilities/total shareholder's equity)	Negative
H_5: Profitability	EPS: Earnings per share	Positive
H_6: Taxes	DTAX: tax dummy =0 for the years 1990-1996 and 1 for the years 1997-2000	Negative
Dependent Variable	DY: Dividend Yield	

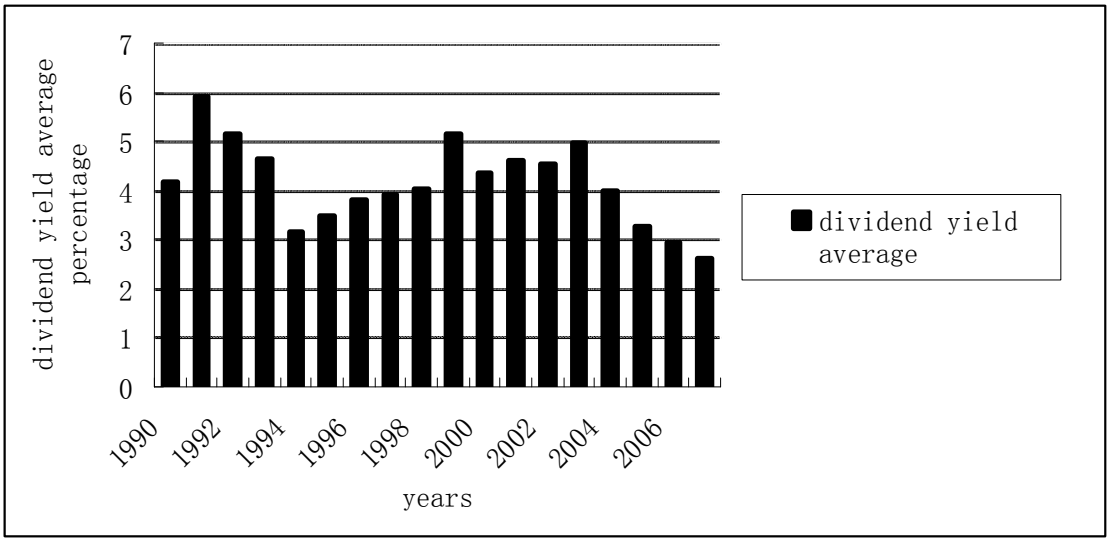
Chapter 6

Analysis and Results

The empirical results will be presented in this part, which based on the testing the dividend payout with 133 listed firms in the UK market between 1990 and 2007. The sample is selected by cutting out the unsuitable industries, unavailable data firms, and time constraints.

Dividend yield shows how much a company pays out in dividends each year relative to share price. As seen from the overview of the firms' average dividend yield in the past seventeen years (figure 2), the general trend is not steady, while there was a sharp decrease until 1995, then increase gently since 1996 which might because of the tax reform in 1996. However, since 2003, the average dividend yield was decreasing again.

Figure 2: The average estimation of dividend yield for 133 firms between 1990 and 2007



6.1 Multicollinearity and Correlation

Table 6 represents the summary statistics of all dependent and independent variables used in the analysis, which reports the mean, standard deviation, minimum and maximum with 2412 observations. The standard deviations of all variables are vary between 0.488 and 5.058, where the return on assets has highest standard deviation. the maximum and minimum value fro DTAX is 1 and 0 which indicates that the DTAX is dummy variable. In order to detect the multicollinearity[8], both correlation matrix and the variance inflation factors (VIF)/Tolerance coefficient can be used. Multicollinearity is a case where there is a strong relationship between two or more explanatory variables. That is, the correlations between the variables are very high (usually more than 0.75 wither positive or negative). VIF/Tolerance test is for the independent variables are computed, shown in the Table 7. Neter et al. (2004) suggests that 10 is proposed as a cut off value, while if non of the Tolerance is lower than 0.1 and non of the VIF is higher than 10, it appears that there is no problem of multicollinearity. As seen from table 6, the estimated VIF values in this case are relatively small (much less than 10) with an mean value of 2.21 which indicating that an absence of multicollinearity between the independent variables.

[8] Multicollinearity: the correlation between the variables are very high (usually > 0.75, either positive or negative)

Table 6. Descriptive Statistics of the Variables

Variables	Observations	Mean	Std. Dev.	Min.	Max.
DY	2412	4.150	2.318	0	20
ROA	2412	8.155	5.058	-10.8	55.75
MBR	2412	2.333	2.582	0.17	55.47
MCAP	2412	2.510	3.672	0.16	138.03
DER	2412	1.360	1.235	.0102	24.783
EPS	2412	1.367	1.601	-13.843	24.783
DTAX	2412	0.611	0.488	0	1

Correlation Matrix

The correlation matrix shows the expected relationship between dependent and independent variables, and also independent and independent variables. The low or moderate correlation between independent variables suggests that the absence of their multicollinearity.

Table 7. Correlation Matrix and Variance Inflation Factors (VIF) for the Explanatory Variables

	DY	ROA	MBR	MCAP	DER	DTAX
DY	1.0000					
ROA	-0.2521	1.0000				
MBR	-0.3160	0.2942	1.0000			
MCAP	0.2341	0.2755	0.8325	1.0000		
DER	-0.0763	-0.1067	0.5498	0.4645	1.0000	
DTAX	-0.0632	-0.0196	0.0708	0.0406	0.0976	1.0000
VIF		1.24	3.89	3.28	1.62	1.01
Tolerance		0.806	0.257	0.305	0 .616	0.989

As seen from the correlation matrix in the table 7, all variables are less than the 0.75, which means that there is no multicollinearity in the regression model. Accordingly, the highest correlation is between DY and ROA, whereas it is only 0.2521 which is far away 0.75. all other correlations are fairly lower than this restriction. In the first column, it is clearly to see that the relationship between DY and each independent variable, where DY is negative correlated with the ROA, MBR, DER and DTAX. However, ROA is positive correlated with MBR and MCAP, negatively related with the other three independent variables. In addition, MCAP is not only positive correlated to the DY and ROA, but also MBR, DER and DTAX. However, it has a higher correlation with MBR, which is higher than 0.75, thus multicollinearity occurred between them. Except DY and ROA, DTAX is positive correlated with the other variables without multicollinearity. Consequently, the results are consistent with the predicted relationship.

Based on the assumptions for the linear regression, the variance of the error term ε_{it} (disturbance term) is constant, where the not constant variance is called heteroscedasticity[9]. Hence, if the variances is not constant, and fluctuate from observation to observation, then the heteroscedasicity exists. The reasons for the existing heteroscedasicity are because of the data entry errors, omitting important variables, incorrect functional form and so on. In order to detect heteroscedasicity, the Breusch-Pagan test is applied, which is devised by Breush and Pagan (1979) and Godfrey (1978) separately. In the case of dividend payout, the result shows a high Chi-square with the zero p-values:

[9] Heteroscedasiticy is a common feature of models which employ cross-section data.

where chi2 (1) =1178.34, thus it is a significant for the 5% significant level). Moreover, Prob > chi2 = 0.0000. As a result, the null hypothesis of homoskedasticity is not rejected and all variables are related each other.

6.2 Analysis Regression Results

The table 8 displays the four main steps for testing the panel data model. Firstly, run a basic regression model (equation 6). As seen from this pooled regression, the P-value for most variables are very significant, where p-value = 0. Therefore, the regression results interpreting the variables as following examples: the return on assets has a negative relationship with the dividend yield, where on average one unit increase in return on assets, the dividend yield will reduce by 0.0713, ceteris paribus. MBR is inverse related to the dividend yield as well, where on average every one unit increase in the market to book ratio, the dividend yield will be reduced by 0.359. Generally speaking, each independent variable has the consistent relationship compared with the predicted relationship. However, the pooled cross-section does not control for time constant unobservable. Additionally, the errors in the pooled cross-sectional are usually serially correlated because of unobserved effect. Hence, it is required to test for heteroskedasticity.

Heteroskedasticity

Models have to be estimated by methods that handle the problems afflicting them. As working with cross-sectional data, it is advisable to check for the presence of heteroskedasticity, which is the case where the variance of the

error term is not constant, but rather change across different segments of the observations. In particular, the variance changes according to the different values of the explanatory variables. The constant variance is called homoscedasicity. In order to test for heteroskedasicity, we can not observe the t-test or p-value. The formal tests for heteroskedasticity are Breusch-Pagan test and White test. All tests share the same hypotheses given as:

H_0 : Heteroskedasicity is not present (homoscedasicity)

H_1 : Heteroskedasicity is present

In this case, the model is a panel data model that is required to use Breusch-Pagan-Godfrey test. This test is also called Cook-Weisberg test which is devised independently by Breusch and Pagan (1979) and Godfrey (1978). Since the chi2 (1) =165.36, Prob > chi2=0.000 is less than 0.05, we reject H_0, and hence confirm that there is in presence of heteroskedasicity (it means that all variables are related).

The Breusch-Pagan Lagrange test statistic suggests that the panel regression model is preferred to the classical OLS regression (Sayrs, 1989). As mentioned before, panel data model is combination of time series and cross-sectional data. Therefore, the equation is required to contain both: $y_{it} = \alpha + \beta x_{it} + \varepsilon_{it}$ is the most simple panel data model, with *i* denoting the cross-sectional dimension, and t denoting the time series dimension. In addition, *i* represents as the unobservable firm specific effects which does not contain in the regression.

After that, the fixed effects model is estimated by using the within transformation to eliminate correlated effects. Hence, for each firm *i*, the average Equation (7) over time as:

$$\overline{DY}_{it} = \beta_0 + \beta_1 \overline{ROA_{it}} + \beta_2 \overline{MBR_{it}} + \beta_3 \overline{MCAP_{it}} + \beta_4 \overline{DER_{it}} + \beta_5 \overline{DTAX_{it}} + f_i + \overline{\varepsilon_{it}} \quad (8)$$

Because f_i does not change over time it appears in both (7) and (8), therefore, processing to the step 2 which is to subtract (8) from (7)

$$(DY_{it} - \overline{DY}_{it}) = \beta_1 (ROA_{it} - \overline{ROA_{it}}) + \beta_2 (MBR_{it} - \overline{MBR_{it}}) + \beta_3 (MCAP_{it} - \overline{MCAP_{it}}) + \beta_4 (DER_{it} - \overline{DER_{it}}) + \beta_5 (DTAX_{it} - \overline{DTAX_{it}}) + (\varepsilon_{it} - \overline{\varepsilon_{it}}) \quad (9)$$

By estimating equation (9) with OLS, the resulting estimator of β_1 , β_2 , β_3 , β_4 , β_5 are called the within estimators. These estimators are free of endogeneity bias because the correlated effect is not involved. After store the fixed effects, it requires estimating the random effects model, and tests for heterogeneity-regressor correlation. The random effects model is similar to the fixed effects model, but the fixed effects model is by using within transformation, and random effects model is required to use GLS regression.

Choosing between fixed and random effects is by running a Hausman test. Considerably, the null hypothesis of this test is no correlation between regressors and individual effects. Thus,

H_0 : The difference in coefficients not systematic

H_1 : The difference in coefficients systematic

The hausman test indicates that the fixed effect model is more appropriate than the random effect model. As the testing result of significant P-value, where Prob>chi2 =0.0171, which is significant on the 95% significant level (where P<0.05). Hence, I reject the null hypothesis, and the result means that the fixed effects model should be used, where hausman test confirm the presence of firm-specific fixed effects.

Finally, in order to compare the results, it is better to re-estimate the model by first-differencing the data. The first-differenced model is seen as below:

$$(DY_{it} - DY_{it-1}) = \beta_1(ROA_{it} - ROA_{it-1}) + \beta_2(MBR_{it} - MBR_{it-1}) + \beta_3(MCAP_{it} - MCAP_{it-1}) + \beta_4(DER_{it} - DER_{it-1}) + \beta_5(DTAX_{it} - DTAX_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \quad (10)$$

It's the other form of transformation that eliminate f_i. Therefore, to estimate the equation by OLS, the resulting estimators of β_1, β_2, β_3 will also be free of endogeneity bias (unbiased).

6.3 Empirical Results Interpretations

This section will display and discuss the empirical regression results which are constructed in table 8. All results will be applied to the case of the determinants of dividend payout of 133 listed companies in the UK market within 1990 and 2007.

Suppose that no any structural changes in the economy, the results of the regression are presented as following:

Table 8. Coefficient Results for Independent Variables

Independent Variables	Coefficients in fixed effects model	P-value	Coefficients in random effects model	p-value	Coefficients in First -difference model	P-value
ROA	-0.107*** (-11.16)	0.000	-0.100*** (-10.74)	0.000	-0.135*** (12.78)	0.000
MBR	-0.332*** (-9.44)	0.000	-0.336*** (-9.92)	0.000	-0.347*** (-4.39)	0.000
MCAP	0.081*** (3.94)	0.000	0.078*** (3.89)	0.000	0. 075* (0.20)	0.845
DER	-0.110** (-2.10)	0.035	-0.115** (-2.33)	0.020	-0.113*** (6.01)	0.000
DTAX	-0.249*** (-3.18)	0.001	-.247*** (-3.15)	0.002	-0.264*** (8.02)	0.000
No. of the observations	2412		2412		2412	
Hausman test	Chi2(5)= 13.78, Prob>chi2=0.0171					
Breush-Pagan test	chi2(1) = 165.36					
P-value	0.000					

Notes: t-statistics are in parentheses. *, ** and ** denotes the variable is insignificant, significant at 5 percent level, and significant at 1 percent level, respectively.

As predicted, the coefficient of proxy of return on assets (ROA) is is negative and statistically significant with the p-value equals to zero. This variable is also economically significant. According to the table 8, other things being equal, a 1 unit change in the return on assets expected to account for 0.107 changes in dividend yield. This indicates that information asymmetric is an important determinant of corporate dividend policy, in particular the level of dividends. In other words, when firms performed well in return on assets, the dividends payment will be increased.

Lintner's model has been a very good guide to the dividends behavior with the firm's growth and future investment opportunities. Theoretically, projects with positive net present value can support an opportunity for firm's future generating more earnings and funds to shareholders. However, investing those projects requires more cash or money from firms. Hence, firms give up or less returning in form of dividends to shareholders transitorily. Generally, investment has risk, some more risky, such as a project with negative net present value. In such circumstance, the growth and investment future opportunities can support strong confidence to the shareholders and outsiders. Consequently, firms with high investment opportunities would like to invest rather than paying cash or profits in form of dividends to the shareholders (Charitou and Vafeas, 1998).

According to the results, P-value is 0.000 and t-statistic shows that the coefficient (-0.332) for MBR is significant value. As seen from this coefficient, it indicates the investment opportunities is negatively related to the dividend payout, where 1 unit increase in the investment opportunities will lead to dividends paid to shareholders reduced by 0.332. In other words, a firm with high growth and investment opportunities generally cause firm to investment more rather than generating internally funds. Hence, firm pays fewer dividends to shareholders. The result is consistent with the previous theory analysis and hypothesis prediction.

Firm size is an important factor to the investment and leverage. Large firms

with high level of leverage or gearing ratio are expected to be high in the debt and have more internal and external funds to generate high level of profits (Bennets and Donnelly, 1993; Charitou and Vafeas, 1998).

As expected, results reports the coefficient on firm size (MCAP) is 0.081 which indicates that the firm size is positively related to the dividend yield. The t-statistic is highly significant at 1 percent level. Hence, interpreting the result as that one unit increase in market capitalization, the dividend yield will be increased by 0.081. That statistic evidence proves that the large firms are easier to access to capital market and pay more dividends than small firms. Many empirical works are also proof of the relationship between firm size and dividend payout (Alli et al., 1993; Fama and French, 2002).

Hypothesis 4 predicts a negative relationship between financial leverage and dividend yield. Through the analysis, the coefficient on debt-equity ratio is -0.110 and at a high level of significance. Aivazian et al. (2003) suggests and as mentioned in the firm size results analysis before, firms with high leverage are expected to have high level of debt-equity ratio firms, thus are likely to pay fewer dividends. This is by the reason of that there is a high level of debt introduced by firm, in order to earn more. The cost of equity will rise in response to increase in debt. The empirical work and model results in table 8 prove that the predicted hypothesis: financial leverage has inverse relationship with dividends. The coefficient on the financial leverage is -0.110, which is negative and statistical high significant level in econometrics model. As

predicted, financial leverage is negatively correlated with dividend yield, where every one unit increase in the financial leverage ratio cause the 0.110 decrease in the dividend yield.

Finally, the last hypothesis is about the tax disadvantage of the dividends. Many scholars and empirical works have been suggests that the tax issue is very important to the dividend policy and comparing to the share repurchase, it has a tax disadvantage. Table 8 shows that the implementation of one unit rise on dividends seems to have a negative impact on dividend payout. The coefficient on DTAX is negative and the level of P-value is fairly significant. Hence, the predicted relationship is tenable, and one unit increase in tax rate on dividends lead to 0.249 reduces on dividend payout. As a example of American Gas Association[10], it shows that reducing the tax rate on dividends is benefit to energy consumers and increase investment opportunities.

Comparing the results through re-estimate the model by first-differencing the data, D is the first difference operator in Stata (it automatically first differences the variables). The table 8 represents the similar results to the within transformation method.

From foregoing discussion, when estimating an unobserved effects model by five effects, it requires to interpret the dependent variable by the time variation.

[10] American Gas Association- dividend tax, downloaded from http://www.aga.org/Legislative/issuesummaries/DividendTax.htm on the date of 17/07/08

In this case, it has not taken into account time effects which refer to the stability of the regression function over time (Greene, 2003). Therefore, the dividend yield function may shift over time on account of changes in government regulatory, tax policies and extreme effects such as war.

To account for time effects where there is time dummy (DTAX) in the regression model, table 9 presents the regression results. Individual time dummy year 1998, 2000 and 2002 was individually statistically insignificant (p value >0.5 with the 5% significance level) and all other time dummies are significant. The estimated coefficients of all independent variables are statistically significant.

Then, it is required to test for the significance of the time effects. In order to test significance, presenting assumptions:

H_0 : The time dummy is equal to zero

H_1 : The time dummy is not equal to zero

Through the test, it concluded that there are time effects in the data.

As shown in table 9, the test result (p-value=0.0000) is very significant, so reject the null hypothesis that the time effects are jointly equal to zero. On the basis of the result, it concluded that the regression model is not appropriate as it leaves the time effects out of model and therefore the regression function is not stable over time. It can observe that the dividends payout tends to decrease with time effect between 1994 and 1998, as well as between 2004 and 2007. Therefore, even there are some positive correlation between 1999

and 2003, the p-value for year 2000 and 2002 are not significant. Hence, the positive coefficients are not used. It can observe that the dividend yield tends to decrease with time especially starting from 2004 due to the time effects.

Table 9: Results for testing time effects

Time	Coefficients	P-value
_Iyear_1991	1.462*** (5.86)	0.000
_Iyear_1992	0.693*** (2.77)	0.006
_Iyear_1993	0.273* (1.09)	0.276
_Iyear_1994	-0.955*** (-3.82)	0.000
_Iyear_1995	-0.728*** (-2.93)	0.003
_Iyear_1996	-0.353* (-1.42)	0.157
_Iyear_1997	-0.066* (-0.26)	0.793
_Iyear_1998	-0.016* (-0.07)	0.948
_Iyear_1999	0.922*** (3.70)	0.000
_Iyear_2000	0.154* (0.62)	0.537
_Iyear_2001	0.317* (1.27)	0.206
_Iyear_2002	0.174* (0.70)	0.487
_Iyear_2003	0.471** (1.88)	0.060
_Iyear_2004	-0.394 (-1.58)	0.115
_Iyear_2005	-1.051*** (-4.22)	0.000
_Iyear_2006	-1.214*** (-4.87)	0.000
_Iyear_2007	-1.451*** (-5.84)	0.000
_Iyear_1991		

Notes: t-statistics are in parentheses. *, ** and ** denotes the variable is insignificant, significant at 10 percent level, and significant at 1 percent level, respectively.

Chapter 7

Limitation

This study has number of limitations. Firstly, only 133 listed companies are taken account into the final analysis and model estimation. Those 133 firms are all selected from the DataStream database. Secondly, because the research period for this paper is between 1990 and 2007, the listed companies are restricted by the listed base date in order to get available data, which is required to be before 1990. Thirdly, data is still limited by the DataStream for some companies' information. Hence, the number of companies is deducted from the original sample. Fourthly, due to the different size of the firms, some of them have absolutely different range or size of the data from others, which cause the accuracy of the results to be influenced. Furthermore, there is only insight to these six factors for UK companies in this research. Six hypotheses are determined in this study but there are more factors in the empirical evidence. In addition, the results for this research are only for the UK market which is not suit to the US markets.

Finally, the research approach in this research is different from some other empirical studies. Hence, the results can only base on this research method and data.

Chapter 8

Summary and Conclusion

A numerous studies conducted to date focused on dividend policy and share repurchases but some important issues still remaining unresolved. This paper has investigated the main determinants of corporate dividend policy for available listed firms in the UK market within 1990 and 2007. Since Miller and Modigliani (1961) introduced the "dividends irrelevance" theory under a perfect capital market. Many other related theories of dividend policy have been appeared in numerous mixed to explain the determinants of dividend payouts. Against the M&M theory, market imperfection provides the dividends relevance theory. Most of studies are concerned on the information content of dividends (signaling), tax clientele effects hypothesis, agency costs, transaction costs, information asymmetric, undervaluation, overinvestment, free cash flow.

Of course, to examine the dividends and share repurchases both at the same time will be much better, however, the data for share repurchases for those listed companies on the UK market is not available and restricted. Therefore, I only examine the determinants for dividend payout in the model and methodology. However, the data for those determinants are not available to be collected from database. Thus, they are analysed by using different variables as proxies for them, which is more convenient way for data collection. Based on the theories that suggested in the previous literature review, there are six hypotheses applied for determining dividend payout, where the hypotheses seems as the predicted direction or relationship for each factors with dividend

payouts.

Theories of dividend payouts are tested through a static panel data model which was used to test the fixed effects and random effects models to identify the determinants of dividend policy in the UK market. Multicollinearity is required to be test in this case, which proves whether the variables are correlated. VIF and Pearson's correlation matrix are used to test in this study, where the results show that the above explanatory variables are related each other and dependent variable as well.

The regression coefficients of all the variables are same as the predicted direction. The data shows that all variables are affect the dividend policy for the firms, while the expected relationship between dividend yield and factors are predicted. Most of the factors have negative impacts on the dividends, except the firm size (MCAP) and profitability (EPS). However, through the analysis of R-square in the simple regression model, EPS is not necessary added into the panel data model. Hence, there only left five factors to be analysed.

The coefficient of information asymmetric (ROA) indicates that if there is information asymmetric for managers, they will reduces the dividends payment to the shareholders. As the level of the information asymmetric increases, the dividend payout decreases. Thus, it is negatively related to the dividend payout. The results are consistent with the predicted hypothesis.

Moreover, the coefficients of financial leverage ratio and investment opportunities negatively and firm size positively correlated to the dividend yield. The foregoing two factors indicate that firms with higher level of leverage have lower dividend payment because of higher burden of transaction cost, and the firms with higher growth are likely to pay lower dividends to the shareholders. Large firms pay higher dividend to shareholders by the reason of that these firms face lower issuance cost. These results are consistent with empirical studies as mentioned before and provide a significant effect of transaction costs on dividend policy of the listed companies on the UK market and firm size plays an important role, which is proved by the Myers and Majluf's (1984) pecking order theory of dividends. The most remarkable factor is taxes, according to the tax disadvantage of dividends comparing to the share repurchases, the hypothesis for tax is predicted as negative relationship with dividends. The results indicate that as the tax rate increases, the managers are likely to buy back shares or pay fewer dividends to the shareholders. This is consistent with empirical works with the dividends and share repurchases.

The study demonstrated the determinants on dividend payout that provided by the existing literature. Many of the factors are found to impact the dividends significantly and the five factors that are tested in this study seems all affect dividend policy in different direction, where taxes and the investment opportunities play the most important role here.

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