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Corporate Dividend Decisions

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Dedication

I would like to dedicate this thesis to my parents, my wife’s mother, my wife and my son for their love.

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Declaration

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Abstract

The main aims and objectives of my thesis are to test the various conflicting hypotheses developed in the previous literature to explain firms' dividend policy, focusing specifically on IPOs and cross-country analysis. In particular, I explore the theoretical links in the context of the important dividend theories including signalling, agency costs, lifecycle and catering and then empirically test the hypotheses by using a very large dataset of UK IPOs from 1990 to 2010, which is extracted from offering prospectuses.

The first empirical study focuses on two aspects of post-IPO decision-making: the decision to initiate dividends and the timing of dividend initiation. I develop the testable hypotheses by linking the dividend decisions of IPOs with a number of firm characteristics and IPO-specific factors in the context of the theories relating to dividends and IPO. I find a strong negative relation between underpricing and the propensity of dividend initiation. This finding is in line with the implications of Dividend Discount Model and Rock's (1986) "winner's curse". My results show that the likelihood of initiating dividends is positively associated with managerial ownership, underwriter reputation, firm size, profitability and long-term debt ratio. In addition, the results show that the initiation propensity is negatively influenced by a serial of factors including the length of lockup period, VC backing, managerial stock option, growth opportunities of IPOs, technology intensity, and selection of growth stock exchange (i.e. AIM). Finally, I find that the IPOs issued in the years when the market put a price premium on dividend paying payers are more likely to pay dividend after IPO and initiate dividends earlier. Overall, my results show that IPO characteristics relate to dividend decisions of IPOs through miscellaneous mechanisms of dividends. The most homogeneous results are associated with the life cycle and catering theories. There is also some empirical evidence in support of signaling and agency theory.

The second empirical study examines the determinants on the dividend policies stated in IPO prospectuses. At the stage of preparing for IPO, pre-IPO financial status is very likely to influence the initial dividend policies. My results provide strong evidence that IPOs that experienced superior performance in profitability and cash inflow from operating activities during pre-IPO period tend to make active dividend policies relatively, consistent with the implication of Lintner (1956) and Benartzi, Michaely and Thaler (1997). My results also show that IPOs with higher turnover ratio and lower capital expenditures tend to choose more active dividend policies when going public, consistent with residual theory and free cash flow hypothesis. In addition, the possibility of choosing relatively active dividend strategies at IPO stage is negatively associated with VC backing, length of full lock-up restriction period, stock option, technology focus, and institutional ownership. In contrast, IPOs with more reputable underwriters tend to declare relatively active dividend policy in prospectuses. The evidence relating to long-term debt ratio and managerial ownership is weak. Moreover, IPOs issued in the 'internet bubble' period or in 2000s opt for relatively conservative dividend strategies. The overall results in this empirical chapter support lifecycle theory, substitution assumption-based agency theory and free cash flow hypothesis, while the evidence on signaling and catering theories is mixed.

Furhtermore, my results support the conjecture that IPOs with active dividend policies release sufficient information through dividend policies declared in offering prospectuses and therefore their formal dividend initiations fail to shock the market. I

find that dividend-paying companies outperform non-dividend paying counterparts during three post-IPO years, indicating that non-dividend initiating IPOs rather than dividend-initiating ones account for the decline in long-run underperformance. Additionally, I find evidence in support of the conjecture that the dividend policies stated in prospectuses communicate the information, and thus reduce the possibilities that outside investors are overoptimistic over the prospect of the invested companies and that managers overstate the pre-IPO financial data at IPO stage.

The third empirical study examines the trends in dividend policies across seven western countries: U.S., Candada, U.K., Germany, France, Japan and Hong Kong. In general, the proportion of dividend paying firms fell significantly from 1989 through to the early 2000s, with the exception of Japanese firms. Thereafter, the percentage reverted slightly in the US, Canada, Japan and in Hong Kong, but continued to decrease in UK, France, and Germany. In contrast, the aggregate amount of dividends increased continuously across countries and firms retained stable dividend payout ratios, and total payout ratios relatively. Share repurchases took over from dividends as the dominant payout method in the US and the increasing importance of repurchases is observed in Canada and in the UK as well. A declining propensity to pay dividends is seen in all the sample countries apart from in Japan, controlling for key firm characteristics.

I find that the likelihood that firms payout dividends or repurchase shares positively correlates with firm’s size, profitability and the ratio of earned/contributed capital, and negatively related to long-term debt ratio. The impact of growth opportunities on payout decisions is not uniform across countries, in line with Denis and Osobov (2008). There is some evidence that cash holdings have a negative relation with the probability of paying dividends and a positive relation with the probability of buying back shares. There is also some evidence that R&D expenditure and technology intensity have a negative influence on a firm’s tendency to pay dividends, but such influence is country-dependent. The effect of M&A on the incidence of payouts is highly country-dependant. For example, US acquirers are reluctant to pay dividends while UK acquirers are more likely to pay dividends.I also examine the determinants of the amounts of corporate payouts. Profitability, growth rate of total assets, and retained earnings are important positive factors in determining dividend amounts. Market to book ratio have a significantly positive effect on both dividend amounts and the repurchase amounts, consistent with Lee and Suh (2011), Alzahrani and Lasfer (2012). Finally, the empirical tests using Lintner model indicate that the link between cash dividends and earnings has weakened, in support of Choe (1990) and Brav, Graham, Harvey, and Michaely (2005). In line with Eije and Megginson (2008), the data demonstrates that dividends are still responsive to earnings. Overall, the evidence in this empirical chapter supports agency cost-based lifecycle theory.

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Chapter One

Introduction

Dividend policy is considered in various textbooks (e.g., Damodaran, 2010) to be one of the main corporate finance decisions, together with investment and financing decisions, firms have to make. According to the latest *Financial Times* dated 29 June 2012, dividends represent 3.74% of the total market value of the 606 UK quoted companies that form the FTSE All Share Index, which is also the return in the form of dividends that companies generate to their shareholders, and 39.8% of earnings generated by these companies. The academic literature is still not clear as to whether, when, why and how companies pay dividends, and whether dividends create or destroy value (see below and Allen and Michaely, 2003; DeAngelo, DeAngelo, Skinner, 2008, for extensive reviews). This controversy stems from the fact that dividends are not only the cash distributed to shareholders, but they are likely to have strong impact on the financing and investments decisions, the agency conflicts between managers, shareholders and debtholders, the information asymmetries between firms and the financial markets, and on the after-tax returns firms generate to their shareholders.

All listed firms are faced with the choice between using their profits to finance future investment opportunities and distributing part of the available cash as dividends. The task of maximizing shareholders' wealth often prompts the management of a listed firm to treat dividend strategy as an important concern since dividend policy interrelates closely with investment decisions and financing decisions (Pruitt and Gitman, 1991; Allen and Michaely, 2003). Previous field surveys have highlighted how company directors believe that their dividend policy influences the value of their firm (Baker and Powell, 1999; Baker, Powell and Veit 2002; Dhanani, 2005, Brav, Graham, Harvey and Michaely, 2005). Dividend policy is important for investors because extensive empirical tests have confirmed that dividend increase (or decrease) announcements are usually followed by positive (or negative) abnormal returns (Pettit, 1972; Charest, 1978; Aharony and Swary, 1980; Asquith and Mullins, 1983; Michaely, Thaler and Womack, 1995； Grullon, Michaely and Swaminathan, 2002). In addition, corporate dividend policy plays an important role in the survival and progress of listed firms. As a result, a substantial amount of research has been undertaken in the area that aims to answer a diverse number of questions posed by all kinds of market participants such as dividend policy makers, shareholders and researchers. Some of the questions asked include, what are the factors that drive firms to pay dividends? How much cash should firms return to investors? When should firms start paying/omitting dividends? Why do firms change their dividend policy? How do firms choose their method of payout, namely between cash dividends and stock repurchases?

It was Lintner (1956) who laid the foundations of dividend theory. Using a survey of US Chief Finance Officers, he uncovered three main stylized facts that lead to a standard model of dividend payout: (i) firms have long term target dividend payout ratios; (ii) managers focus more on dividend changes than on absolute levels; (iii) dividends changes follow shifts in long-run, sustainable levels of earnings rather than short-run changes in earnings; and (iv) managers are reluctant to make dividend changes that might have to be reversed. This suggests that firms smooth their dividends. Consequently, the empirical evidence shows that dividends at particular year can be explained by current earnings and lagged dividends. Over the years, these two factors which constitute what is known as the Lintner's model, has become the gold standard of dividend theory, and has been developed and supported by a relatively very large number of subsequent studies (e.g.Fama and Babiak, 1968; Lasfer, 1996; Baker and Powell, 1999; Garrett, Priestley, 2000, 2012; Dhanani, 2005; Brav, Graham, Harvey, Michaely, 2005). The implications of this model is that dividends act as a signal of past as well as future firm's prospects.

Further progress in the field of dividend theory occurred when Modigliani and Miller (1961) claimed that investment policy rather than dividend policy influences the value of firms under perfect capital market conditions, without taxation, transaction costs, agency conflicts, information asymmetry, or institutional constraints. They suggested that dividend policy is irrelevant for stock investors because any mix of dividends and retained earnings can be homemade in a perfect capital market freely. The main breakthrough of this theory is the definition of the conditions under which dividends become relevant. Thus, this theory implies that dividends are likely to be affected by information asymmetry (signaling), managerial private benefits (agency costs), taxation, and investors' preference of dividends (behavioral finance).

The relaxation of the Modigliani and Miller's assumptions has resulted in the development of relatively very large number of theoretical models and empirical investigations of the impact of each of the factors. While dividends will results in an increase in value when shareholders like dividends, or when dividends operate as a signal of future prospects, and/or mitigate the agency conflicts between managers and shareholders, they will reduce value if there are tax disadvantaged relative to capital gains. These conflicting roles of dividends lead to a number of controversies that can summarized in Black (1976) famous "dividend puzzle" argument when he questioned why firms pay dividends, and why investors are concerned with dividends if it is indeed the case that dividend are irrelevant or tax disadvantaged. In particular, he questioned the practice of paying dividends at the time when the US capital gains are taxed at lower rate[1] and, thus, firms should not pay dividends, as they will benefit their shareholders by deferring tax payments if they chose to realize capital gains by selling their shares. More recently, Fama and French (2001) added to this controversy by showing that dividends are "disappearing" as the proportion of US firms that pay dividends decreased substantially from 66.5% in 1978 to 20.8% in 1999, and this decline cannot be completely explained by some firms' fundamental factors defined in the conditions of Miller and Modigliani (1961) or by the practice of share repurchases.

The main dividend theories will be discussed in detail in the Literature Review that follows in the next chapter. However, it is important to note that the influence of taxes and clientele on dividend policy will not be dealt with in this thesis, as a discussion of this subject matter is beyond the scope of my research. However, these areas might be a suitable topic for further research.

1.1 Gaps in Previous Research

In spite of the extensive research undertaken into dividend policy, gaps in research remain, from both theoretical and empirical perspectives. These gaps are noted by Allen

[1] This lasted until the Bush tax cut took effect in May 2003 (Julio and Ikenberry, 2004; Chetty and Saez, 2005). The Bush tax cut lowered the dividend tax marginal rate from 35 percent to 15 percent, to be the same as the tax rate of capital gains.

and Michaely (2003) and DeAngelo, DeAngelo and Skinner (2008) amongst others. In particular, any attempt to achieve a consensus or to find a universal solution to certain dividend problems may not be attainable because dividend policy operates in a real world environment that is multivariate and complicated. Baker, Saadi, and Dutta (2008) note this difficulty of developing a one-size-fits-all explanation for dividend policy, and they explain that factors such as legal regulation, corporate governance, and firm characteristics vary across countries. Frankfurter and Wood (1997) suggest that the, 'Dividend-payment patterns (or what is often referred to as "dividend policy") of firms are a cultural phenomenon, influenced by customs, beliefs, regulations, public opinion, perceptions and hysteria, general economic conditions and several other factors, all in perpetual change, impacting different firms differently. Accordingly, it cannot be modeled mathematically and uniformly for all firms at all times.' (p.31)

This thesis will focus mainly on the dividend policy of IPOs and the impact of cross-country differences on dividend payments of a large sample of firms to shed some light on the decision of newly listed firms to initiate dividends and to identify the forces that shape corporate dividend policy across major western countries. My research is primarily motivated by the following gaps that existed in previous dividend research:

(1) There is limited previous research that focuses on the dividend behaviour of Initial Public Offering (IPO) firms. Recent empirical studies that focus specifically on IPOs (Bulan, Subramanian and Tanlu, 2006; Jain, Shekhar and Torbey, 2009; Kale, Kini and Payne, 2012) have not completely identified the theoretical links between IPOs and post-IPO dividend decisions, and the evidence produced is often contradictory. For instance, Michaely and Shaw (1994) argue that firms who underprice less tend to pay higher dividends, but this contradicts Allen and Faulhaber's (1989) hypothesis in respect of IPO signaling, and Kale et al. (2012) do not find that underpricing affects dividend initiation decisions in their multivariate regression analysis.

(2) The influence of IPO-related elements, such as lock-up agreements, managerial owership, institutional ownership, and managerial option plans, have also not been examined in detail, although previous studies have hinted that these ignored factors have potential for explaining the dividend behaviour of IPOs. For example, previous studies (Courteau, 1995; Gale and Stiglitz, 1989; Brav and Gompers, 2000; Espenlaub, et al, 2001; Brav and Gompers, 2003) aregue that lockup agreement serve to address

information asymmetry and agency conflicts, but the impact of lockups on dividends of IPOs has so far been undertaken by comprehensive studies.

(3) Previous research on dividend policy of IPOs has been undertaken predominantly on the US basis. Although the US and the UK are relatively similar in terms of governance, there are various institutional settings, including regulation, competition, and tax rules that are different. For example, Faccio and Lasfer (2000) identified a number of differences between the UK and US governance systems relating to the number of companies quoted in each exchange, shareholder activism and differences in the categories of shareholders. Moreover, the corporate governance requirements are relatively stronger in the UK as firms have to split the roles of the CEO and the chairman. Therefore, the testing of the empirical hypotheses on the determinants of dividend policy in a relatively more regulated market such as the UK, but where companies may suffer from the same free cash flow problems as their US counterparts will strengthen the evidence provided to-date. Moreover, although IPO firms in the UK are required to state their dividend policies in their prospectuses, in accordance with disclosure law, existing studies about dividend policy have not examined what factors influence how a firm shapes its dividend policy at IPO stage.

(4) The existing literature does not test for the impact of the pre-IPO financial status on the announcement of dividend policy in the IPO prospectus. Previous studies focus on seasoned firms and analyze the determinants of and the market reaction to dividend initiations (e.g. Asquith and Mullins, 1983; Healy and Palepu, 1988; Christie, 1990), partly because of data collection problems and gaining access to accurate data about IPOs. Such dividends initiations are less likely to be foreseen by outside investors and their announcements lead to significant excess returns to reflect the dividend surprise. However, some IPO do state in their prospectus the dividend policy they will adopt in the post-IPO period. This issue is not explicitly analyzed in previous studies that focus on dividends of IPOs. I will use the pre-IPO accounting information disclosed in the prospectuses, profit and loss statements, balance sheets, and statements of cash flow to assess the determinants of dividend policy as stated in the IPO prospectuses.

(5) In the last paper, I re-examine the disappearing dividend phenomenon by using a very large dataset across western countries. The review of the literature shows that incremental evidence is required for researching international trends in dividend

payments. Fama and French (2001) argue that there is a declining trend in the propensity to pay dividends, after controlling for company characteristics[2] and Denis and Osobov (2008), Eije and Megginson (2008) and Ferris, Sen and Unlu (2009) confirm this trend using the same method. However, Denis and Osobov (2008) find that this declining propensity to pay dividends is not as significant as some research leads us to believe, and they do not rule out the possibility that the trend is limited to newly listed firms. In addition, the method of Fama and French (2001) in measuring the propensity of paying dividends is sensitive to the selection of benchmark period, control variables, the corrections of standard errors for panel data. For example, the sample benchmark period used by Denis and Osobov (2008) and Eije and Megginson (2008) is 1989-1993 and this can be compared to the benchmark period of 1994-1997 used by Ferris et al (2009). Eije and Megginson (2008) do not control for the ratio of retained earnings to total equity as when estimating baseline model, but Denis and Osobov (2008) and Ferris et al (2009) do in their analyses. Fama and French (2001) and Denis and Osobov (2008) utilise Fama and MacBeth's (1973) procedure as correction of standard errors, but Ferris et al (2009) do not specify what method they use. These controversies motivate my analysis.

(6) Non-US evidence in respect of the substitute relation between dividends and share repurchases is limited. For example, Grullon and Michaely (2002) and Skinner (2008) show that US listed firms are gradually substituting repurchases for dividends to distribute residual cash flow, and Brav et al. (2005) report that managers favour repurchases as a more flexible method of payout. In contrast, Ferris, Sen and Yuiet (2006a) find that the number of repurchases in the UK is small in 1990s. Although Eije and Megginson (2008) observe that the number of repurchases increased across fifteen European countries from 1989 to 2005, their analysis treats different countries as one entity rather than looking at individual countries.

(7) Recent comparable multination-based studies (Denis and Osobov, 2008; Ferris et al, 2009) focus more on examining whether firms pay dividends and the propensity to pay dividends. More dividend behaviors such as dividend changes, dividend initiation and omission have not been empirically investigated using multinational data. Examining

[2] Refers to firm size, profitability and growth opportunity

various dividend behaviors contributes to the complete understanding towards global dividend policies. In addition, dividend policies adopted by companies across countries can be driven by far more factors such as cash holdings, technology focus, R&D expenditure, M&A factor and de-listing risk. Eije and Megginson (2008) find that cash holdings have negative effect on cash dividends and positive effect on repurchases, but they do not detail the theoretical argument. The free cash flow theory predicts that technology intensity and R&D expenditure and reduces the residual capital and will adversely affect corporate payouts. To my knowledge, the previous literature did not analyse the effect of M&A factors and delisting on dividends. Jeon, Ligon and Soranakom (2010) only discussed how the pre-merger dividend policies of acquirer and target affect the choice of payout method between stock takeover and cash takeover.

1.2 Research Objectives

The research objectives set for each empirical chapter of this research are devised from the gaps as stated above and by means of a full investigation of previous studies in respect of corporate dividend decision making, as outlined in the literature review chapter. In particular, I use a very large dataset of UK IPOs from 1990 to 2010, which is extracted from their prospectuses. I explore the theoretical links in the context of the important dividend theories including signalling, agency costs, lifecycle and catering and then empirically test the hypotheses by employing a number of IPO-specific factors and fundamental firm characteristics as proxy variables. In addition, I assess the impact of pre-IPO financial status on the dividend policy stated by these IPOs in their prospectuses. Moreover, I expand previous studies that test the disappearing dividends across countries and look at the extent to which repurchases play a role in dividend policy. I investigate the determinants on not only whether firms pay dividends or repurchase shares but also the amount of dividends and repurchases. I also analysis the firm characteristics associated with various dividend behaviours.

The main aims and objectives of my thesis are to test the various conflicting hypotheses developed in the previous literature to explain firms' dividend policy, focusing specifically on IPOs and cross-country analysis. I summarise below the main issues analysed and I provide in the forthcoming chapters detailed discussions. In order to investigate and answer the research question posed, this research is divided into three separate empirical chapters, and each considers three separate but interrelated topics.

1.2.1 Research Objectives for Chapter 3

This chapter focuses on examining two aspects relating to the dividend behavior of UK IPOs: the likelihood of IPOs to pay dividends and the timing of dividend initiation. I put emphasize on developing testable hypotheses which theoretically link the IPO characteristics and the dividend behaviour of IPOs in the context of signalling, agency costs, lifecycle and catering theories of dividends. Existing research has not provided clear theoretical links, hence, this chapter aims to address this problem. I test the impact of information asymmetries and agency conflicts on the decisions of IPOs to initiate dividends. I also assess whether mature firms have stronger willingness to initiate dividends in comparison to young firms in light of lifecycle hypothesis. In addition, the inclusion of dividend premium as an explanatory variable allows the tests to provide new evidence for catering theory. The chapter details statistical evidence relating to the trends in the likelihood of UK IPOs to pay dividends, and the timing of dividend initiation over the sample period chosen.

The chapter investigates the IPOs' propensity to pay dividends by using a large number of proxy variables for the main dividend hypotheses. There are two categories of explanatory variables: IPO-specific factors and fundamental financial accounting variables. IPO-specific factors include: underpricing (i.e. first-day returns), directors' ownership, length of lock-ups , the percentage of locked-up agreements, managerial stock options, institutional ownership, venture capital participation, underwriter reputation , dividend catering (dividend premium), high technology firm dummy data, and AIM dummy data. Financial accounting variables include: firm size, profitability, growth opportunity, leverage, sales, R&D, capital expenditure, and working capital.

The sample used in Chapter 3 comprises 1707 Initial Public Offerings (IPOs) listed on the main market and on the Alternative Investment Market (AIM) of the London Stock Exchange with an official admission date of between January 1st, 1990 and December 31, 2010. The information about the list of IPOs is gained from the New Admissions Summary[3], DataStream and offering prospectuses[4]. The raw data on IPO-specials is hand-collected primarily from the offering prospectuses supplied by Perfect Filings, and raw data on financial variables is sourced from DataStream and London

[3] It is publicly accessible from the official website of London Stock Exchange and contains data from June 27, 1995.
[4] It is supplied by Perfect Filings database.

Stock Exchange statistics.

1.2.2 Research Objectives for Chapter 4

This chapter examines the determinants of the initial dividend policies as stated in IPO prospectuses. In prospectuses, the issuing firms do not use a standard format to state their post-IPO dividend policies. In other words, dividend policies stated in the prospectuses differ from firm to firm. This chapter attempts to identify the theoretical links between these influential factors and dividend policies at IPO stage within the context of signaling, agency costs, life cycle, and catering theories of dividends.

At the stage of preparing for IPO, the preliminary dividend policy is likely to be directly influenced by its pre-IPO financial status. Therefore, different from previous studies that focus on seasoned firms, this part of study investigates the relation between pre-IPO financial performance and the dividend strategy of IPOs when going public. Additionally, the IPO-related factors which had been used in Chapter 3 are employed as influencers in analysis.

To compare the key firm characteristics and IPO-related factors between IPO groups with different preferences at IPO stage, my study classifies sampled firms into four sub-groups according to the decision makers' attitudes toward dividend payment, as follows: Type 1 firms declare the most positive dividend policies, stating that they would definitely start dividend payments after admission. Type 2 firms pursue an active or progressive dividend policy[5], but relative to Type 1 firms, they are more likely to default dividend payments if their financial status cannot reach the expected standard. Type 3 firms clearly express that they have no intention to pay dividends in the near future, and Type 4 firms even do not state any information about future dividend policy. One may argue that Type 3 firms resemble Type 4 firms in terms of their style of dividend policy. Therefore, I track the post-IPO dividend patterns of IPOs in the sample and find that the incidence of initiating dividends of Type 3 IPOs is higher than that of Type 4 IPOs in medium term (2-5years). Further, to mitigate the influence of this issue, I pay attention to observe if the empirical results are sensitive to such classification and execute robust tests to check the influence of this issue on the conclusion.

The sample used in Chapter 4 comprised 932 Initial Public Offerings IPOs listed

[5] In IPO prospectuses, firms frequently use the phrase, 'progressive dividend policy' to indicate they that have positive and active attitude toward paying dividends. In this study, Type 1 IPOs have more progressive dividend policies than Type 2, Type 3 and Type 4 IPOs. Accordingly, Type 1 and Type 2 IPOs have more progressive dividend policies than Type 3 and Type 4 IPOs.

on the main market and AIM of London Stock Exchange during the 15 years from 1996 through to 2010. Historical financial records relating to pre-IPO financial performance are collated manually from profit and loss statements, balance sheets, and statements of cash flow for 3 consecutive pre-IPO years as shown in the offering prospectuses. The raw data includes: total assets, profits for the financial period, net cash inflow from operating activities, increase in cash in the financial period, total turnover, long term debts / debts due after more than one year, net cash outflow from capital expenditure.

1.2.3 Research Objectives of Chapter 5

This chapter examines global trends in dividend policy across seven developed economies, including US, Canada, UK, Germany, France, Japan and Hong Kong, between 1989 and 2010. Moreover, I focus on the extent to which repurchases play a role in dividend policy. This chapter aims to answer a series of questions posed in previous studies about international dividend trends, such as, has the percentage of dividend-paying companies been declining across countries over the past 20 years? Has the percentage of dividend-paying companies started to recover in the recent ten years, as hypothesized by Julio and Ikenberry (2004)? What is the evolution of aggregate dividend amounts in each country? What is the evolution of payout ratios in each country? Have companies substituted stock repurchases for dividends worldwide?

Using a model suggested by Fama and French (2001), this chapter investigates the propensity of firms to pay dividends across countries. I test the hypothesis that the decision to pay or to change dividends is affected by the key firm characteristics such as firm size, profitability, growth opportunities, ratio of retained earnings to total equity and leverage. I also use a wide range of additional variables including firm age, cash holdings, R&D expenditure, catering proxy, high-technology dummy, M&A factor and delisting risk to explain whether firms pay dividends or repurchase shares and the amounts of dividends and repurchases. I compare the firm characteristics between firms take place various dividend behaviours such as dividend increase, dividend decrease, dividend unchanged, dividend initiation, dividend omission and dividend continuation. I follow Skinner (2008) and Eije and Megginson (2008) to examine the relationship between dividend payouts and earnings, and adjustment speed of dividends by using Linter (1956) model. Moreover, following models suggested by Skinner (2008) and Eije and Megginson (2008) this chapter examines the relationship between dividends and earnings and the speed of adjustment of dividends. Finally, following a method proposed by Grullon and Michealy (2002) I use the transition matrix to examine the changes in payout methods in my sample countries.

The initial sample data includes all non-financial, non-utility firms registered in my sample countries. Of the countries sampled in this research, the US, the UK, Japan, Canada, Germany, and France are also included in the research of Denis and Osobov (2008), but this study adds Hong Kong to the list because it is an influential well-managed Asian economy, subject to common law jurisdiction, has sufficient dividend payers and nonpayers as observations over my sample period. Hence, the inclusion of Hong Kong strengthens the representativeness of the sample and allows me to observe the primary tendency in international dividend patterns. I mainly collected the relevant data from Worldscope via DataStream.

1.3 Methodology

The specific methods of empirical analysis used in this research, including equations formulated for analysis, are explicitly detailed in each relevant empirical chapter. The main methodologies used can be summarised as follows:

(1) Univariate Analysis

Univariate analysis primarily provides descriptive information of data and basic quantitative results, which are then used to compare with those obtained from various multivariate tests. Variables are compared between control groups then the means, medians and t-statistics of the differences in means are reported. T-statistics are calculated using the following equation:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}} \qquad (1-1)$$

In this equation, where M_1 and M_2 are mean values of the indicator variables for two types of IPOs, σ_1^2 and σ_2^2 are the variances of the indicator variables, and N_1 and N_2 relate to the number of observations.

(2) Cross-Sectional Binary Logistic Model

Cross-sectional binary logistic model is a multivariate method used for investigating events of interest with two possible outcomes, e.g. pay dividends vs. does not pay dividends. The formulation is as below:

$$log\left(\frac{P(y_i=1|X_i)}{P(y_i=0|X_i)}\right) = \beta_0 + \beta_i X_i \qquad (1-2)$$

The dependent variable y_i takes on the value of 1 to indicate if a certain event happens and the value of 0 otherwise. X_i represents the vector of control variables that defined and 'i' indicates the number of control variables in each model. The probability of event such as paying dividends, $(y_i = 1|x_i) = \frac{1}{1+e^{-(\beta_0+\beta_i x_i)}}$. The nature of logit model determines that the probability of event has an upper bound of 1 and a lower bound of 0. Cross-sectional logistic regressions are estimated using software Stata that is able to produce pseudo R^2 and chi-squared statistic.

$$pseudo\ R^2 = 1 - \frac{log\,L}{log\,L_0} \qquad (1-3)$$

In equation (1-3), $logL$ is the log-likelihood and $logL_0$ is the log-likelihood when the regression only has the intercept. The null hypothesis of chi-squared statistic is that all explanatory variables have the coefficients of 0. Thus, chi-squared statistic indicates the explanatory power of model.

$$Chi\ x^2 = 2log\,\frac{L}{L_0} = 2(logL - logL_0) \qquad (1-4)$$

(3) Cross-Sectional Ordinal Logistic Models

When an event of interest can be classified into more than two categories, and when the values of each category had a meaningful sequential order, an ordinal rather than a binary model is used. For example, when investigating the timing of dividend initiation, the time taken to initiate dividends is categorised into three groups: the "Within 1 year" group, the "Between 2 and 4 years" group, and the "After 4 years" group. These groups were in turn given the value of 1, 2 and 3 respectively, and this enabled all observations in this sample to be ordered according to the timing of dividend initiation. The formula used is as follows:

$$log(P_j) = \beta_j + \beta_i X_i \qquad (1-5)$$

X_i corresponds the vector of control variables. 'i' indicates the number of control variables and 'j' indicates the critical values (i.e. 1 and 4 for the current example). Notably, the number of odds equals the number of categories minus one.

$$P_j = \frac{Probability\ (observed\ value \leq j)}{1 - Probability\ (observed\ value \leq j)} \qquad (1-6)$$

The terms β_j are similar to the intercept term in binary logistic model. However, the coefficients β_i are the same for all odds.

(4) Cox's Proportional Hazards (CPH) Model

Cox's Proportional Hazards model has been extensively applied in previous research because of its ability to estimate factors that influence the timing of events on censored observations (Shumway (2001)). CPH model is a semi-parametric model (Horowitz 1996). The fundamental formulation of Cox's model is:

$$h(t) = h_0(t)e^{(b_1x_1+b_2x_2+\cdots+b_kx_k)} \qquad (1-7)$$

In Equation (1-7), $h(t)$ represents the hazard function, which can be estimated as the proportion of individuals that experience the event of interest, e.g. dividend initiation, in a certain time interval (Allison, 1984; Le Clere, 2000). $h_0(t)$ represents the baseline hazard or the hazard for an individual when all the covariates are equal to 0. Coefficients of the proportional hazards model are estimated by maximizing the partial likelihood. Efron (1977) suggests that partial likelihood estimation is efficient, especially when being applied to the analysis of a large sample. A positive estimated coefficient indicates that the hazard rate increases with the independent variable, and consequently the event of interest takes place earlier.

According to Allison (1995), a hazard ratio indicates the percentage change in the hazard of an event caused by a unit increase in the control covariate when controlling for other covariates. Therefore, Relative Hazard Ratio can be formulated as:

$$\frac{h(t)}{h_0(t)} = e^{(b_1x_1+b_2x_2+\cdots+b_kx_k)} \qquad (1-8)$$

When the hazard ratio exceeded 1, the associated covariate indicated a greater hazard of incidence of dividend initiation. Contrastingly, a hazard ratio of less than 1 indicated that the associated variable causes a decline in the possibility of dividend initiation.

(5) Logistic Panel Regression Model

The cross-sectional logistic regression model does not capture the effect of time-varying factors on corporations' dividend initiation decisions. Panel data analysis has an advantage over cross-sectional data for capturing the dynamics of variables because it analyses two dimensions: the cross-section and the time series. Additionally, panel data provide efficient econometric estimation by increasing the number of data points (Hsiao, Mountain and Ho-Hillman, 1995). If not every cross-section has the same number of observations along the time series, the data represents an unbalanced pool sample (Wooldridge, 2002).

The dependent variable is a dichotomous variable, which assumes the value of 1 if a firm initiated dividends in a year and 0 otherwise. Therefore, the formulation of the multivariate binary model is as follows:

$$log\left(\frac{P(y_{it}=1|X_{it})}{P(y_{it}=0|X_{it})}\right) = \beta_0 + \beta_i X_{it} \qquad (1-9)$$

In equation (1-9), $\mathrm{X_{it}}$ represents the vector of control variables. For each individual 'i' in the population, there is a binary response y_{it} applies for each sample year.

The time-series correlated standard errors for the logistic panel model should be validated (Wooldridge, 2002; Petersen, 2009). Skinner (2008) and Eije and Megginson (2008) estimate pooled regressions with robust standard errors clustered across firms. Ferris, Jayaraman, and Sabherwal (2009) estimated panel regressions with clustered standard errors in two dimensions of firm and year. According to Petersen (2009), I estimate panel logistic regressions with clustered standard errors in two dimensions of firm and year in Chapter 5 of this thesis.

Petersen (2009) also points out that the bootstrap method is an alternative solution for addressing standard errors in a panel data set (e.g. Efron and Tibshirani, 1986; Horowitz, 2001; Kayhan and Titman, 2007). Testes conducted by Cheng, Nagar, Rajan (2005), Petersen (2009), and Greene (2010) show that the bootstrapping procedure are efficient in detecting and correcting the clustered standard errors. In addition, Bulan et al. (2007) and Kale et al. (2012) apply the method of bootstrapping[6] to estimated standard errors in probit or logit panel regressions. Therefore, I use the bootstrapping method with 200 iterrations to deal with the time-series clustering in logistic regressions in Chapter 3 of this thesis.

(6) The Linear Probability Models (LPM)

By using the Linear Probability Model (LPM) model with OLS, Newey-West method, Generalized Least-Squares (GLS)[7], or Fama-MacBeth procedure, the results gained from the logistic panel model tests can be verified. The formulation is as the following:

[6] Bootstrapping is a popular re-sampling method and Monte Carlo simulation. It can be used as an alternative to using asymptotic approximations for detecting standard errors, confidence intervals, and p-values for test statistics. Computer simulations can be used to estimate complicated non-linear models when traditional optimization methods are not effective (Wooldridge 2000). The equation for Bootstrap Estimation of Standard Error is:

$$\widehat{se}B\left(\tilde{\theta}\,*\right) = \sqrt{\frac{1}{B-1}\sum_{b=1}^{B}(\tilde{\theta}^{(b)} - \overline{\tilde{\theta}\,*})^2}, \text{ where } \overline{\tilde{\theta}\,*} = \frac{1}{B}\sum_{b=1}^{B}\tilde{\theta}^{(b)}$$

[7] Petersen (2009) suggests that researchers can use GLS to check the efficiency of model specifications.

$$\boldsymbol{y_{it}(y_{it} = 0, 1) = \beta_0 + \beta_i X_{it} + \varepsilon_{it}} \qquad (\mathbf{1-10})$$

In Equation (1-10), $\boldsymbol{y_{it}}$ is the qualitative dependent variable and this assumes a value of 0 or 1. $\boldsymbol{X_{it}}$ represents the vector control variables and $\boldsymbol{\varepsilon_{it}}$ is the error term.

(7) Event Study

A standard event study methodology (Brown and Warner, 1985; Mackinlay, 1997)[8] is used to measure the market reaction to dividend initiation announcements. The abnormal return for firm *i* and a single observed day t in the event window is computed as:

$$AR_{it} = R_{it} - ER_{it} \qquad (1-11)$$

where AR_{it}, R_{it} and ER_{it} represent abnormal return, actual return and expected return. Follow previous dividend studies[9], expected return (ER_{it}) is estimated by market model in which the market portfolio selected is FTSE All-Share Index.

$$R_{iT} = \alpha_i + \beta_i R_{mT} + \varepsilon_{iT} \qquad (1-12)$$

where R_{iT} and R_{mT} stand for the returns of individual stocks and of market portfolio over the estimation window respectively. ε_{iT} is the zero mean disturbance term. α_i and β_i are then used to calculate ER_{it} with using the actual market return R_{mt} over the event window.

$$ER_{it} = \alpha_i + \beta_i R_{mt} \qquad (1-13)$$

The average daily abnormal return at the event date *t* is the mean across the observations:

$$\overline{AR_t} = N^{-1} \sum_{i=1}^{N} AR_{it} \qquad (1-14)$$

The cumulative abnormal returns over the event window (t1, t2) can be calculated as:

$$CAR_{t1,t2} = \sum_{t=t1}^{t2} \overline{AR_t} \qquad (1-15)$$

The t-value of CARs (Rubac, 1982; Bonnier and Bruner, 1989; Mackinlay and Hamill, 1997) is:

$$t\left(CAR_{t1,t2}\right) = \frac{CAR_{t1,t2}}{\sqrt{(t2-t1+1)var_{t1,t2}(\overline{AR_t}) + 2(t2-t1)cov_{t1,t2}(\overline{AR_t}, \overline{AR_{t-1}})}} \qquad (1-16)$$

(8) Long-Run Adjusted Return

According to Ritter (1991) who propose the original method to measure long-run

[8] Ball and Brown (1968) and Fama et al. (1969) developed earlier seminal method of event study.

[9] Compbell and Wasley (1993); Lasfer (1995); Lipson et al. (1998); McCaffrey and Hamill (2000); Jain, et al. (2009)

performance of IPOs, each sampled event month comprises 21 successive trading days. The market-adjusted return for stock *i* in event month *t* is defined as:

$$ar_{it} = r_{it} - r_{mt} \quad (1-17)$$

where r_{it} and r_{mt} represent the actual return for stock *i* in event month *t* and the market return in event month *t* respectively. The average benchmark-adjusted return for each event month *t* is computed as:

$$AR_t = \frac{1}{n}\sum_{i=1}^{n} ar_{it} \quad (1-18)$$

and the t-statistic for AR_t is computed as:

$$t\text{-}AR_t = \frac{AR_t \times \sqrt{n_t}}{\sigma_t} \quad (1-19)$$

Where n_t and σ_t represent the number of firms trading in event month *t* and the standard deviation of ar_{it} respectively. The cumulative average market-adjusted return for the event window between the first month and the event month is defined as:

$$CAR_t = \sum_{t=1}^{t} AR_t \quad (1-20)$$

and the t-value for CAR_t is computed as:

$$t - CAR_t = \frac{CAR_T \times \sqrt{n_t}}{\sqrt{t \times var + 2 \times (t-1) \times cov}} \quad (1-21)$$

where *t* is the event month, *var* is the average cross-sectional variance over 36 months, and *cov* is the first-order autocovariance of the AR_t series.

(9) Ordinary Linear Square (OLS) Panel Regression Model

As same as logistic panel regression model, OLS panel regression model has the capability to capture the effect of time-varying factors on response variables. The model specification of OLS pooled regression model is given by

$$y_{it} = \alpha + \beta_i X_{it} + \varepsilon_{it} \quad (1-22)$$

In equation (1-5), the dependent variable $\mathrm{y_{it}}$ is the dividend ratio which is the cash dividends paid scaled by total assets, or the repurchase ratio which is the share repurchases scaled by total assets[10]. $\mathrm{X_{it}}$ represents the vector of control variables for each firm-year observation. ε_{it} represents unobserved random factors including firm-specific and time-specific shocks[11]. Again, as suggested by Petersen (2009) the clustered standard errors for the two elements of firm and year, are corrected in the estimations.

[10] Aivazian and Booth (2003), Lee and Suh (2011) and Alzahrania and Lasfer (2012) have used the same measure to investigate dividends or repurchases.

[11] There are three assumptions for the error term ε_{it} $[\mu = 0]$: (i) No autocorrelation $\mathrm{cov}(\varepsilon_{it}, \varepsilon_{is}) = 0$ (ii) Homoskedasticity $\mathrm{var}(\varepsilon_{it}) = \sigma^2$ (iii) Cross-section independence $\mathrm{cov}(\varepsilon_{it}, \varepsilon_{jt}) = 0$

(10) Measuring the Propensity to Pay Dividends

Chapter 5 of this thesis looks at a firm's propensity to pay dividends. The basic methodology used is that proposed by Fama and French (2001), which has been widely used in previous studies (Eije and Megginson, 2008; Denis and Osobov, 2008; Ferris et al., 2009). When estimating logistic panel regressions it is essential to find a way to overcome clustering problems. As Petersen (2009) states, in panel data regression analysis the clustering of residuals across firms or across time is very likely and will lead to biased standard errors. Therefore, this research corrects two-dimensional clustered standard errors across firms and across years in the estimation of logistic panel regressions.[12]

(11) Examining the relationship between dividend payouts and earnings, and adjustment speed of dividends using the Linter model

Following models suggested by Skinner (2008), and Eije and Megginson (2008), Chapter 5 employs the Lintner's model to assess the extent to which earnings and lagged dividends explain current dividends. The implied speed of adjustments and optimal payout ratios are then compared across countries. My expectation is that these factors will be country specific and will be affected amongst other things by the corporate governance system in each country.

(12) Transition matrix of payout methods

In order to track changes made in payout methods by the firms sampled, in Chapter 5 of this thesis, a transition matrix is used in order to examine the dynamics of corporate payout methods occurring in the sample countries. This method was first developed by Grullon and Michealy (2002) and has recently been used by Lee and Suh (2011). Moreover, previous studies do not consider the effects of some important IPO-specific factors, such as lock-ups, the proportion of shares retained by insiders, post-IPO institutional ownership, and managerial option plans on the dividend decision in the post-IPO period.

[12] Ferris, Jayaraman and Sabherwal (2009) use a similar method in their panel data analysis.

1.4 Summary of the Main Findings

1.4.1 Chapter 3 – When Do IPOs Start Paying Dividends?

The first empirical study, Chapter 3, contributes to identifying the theoretical links between dividend decisions and IPO characteristics by combining dividend policy and the various theories underlyining IPOs. Recent studies (Bulan, Subramanian and Tanlu, 2006; Jain, Shekhar and Torbey, 2009; Kale, Kini and Payne, 2012) have not completely identified these theoretical links. In developing the testable hypotheses, I focus on the signaling, agency costs, life cycle and catering theories of dividends.

I contribute to the previous literature by answering two fundamental questions, namely: Has the probability that an IPO firm starts paying dividends been shifting over time? When do IPO firms start to pay dividends? The results show that during the sample period 1990-2000, the percent of dividend-initiating IPOs is 46.8%, but IPOs issued in 2000s are generally more reluctant to initiate dividends than those issued in the 1990s (70.8% vs. 32.6%, respectively). The results also indicate that more than half of dividend-paying companies start to pay dividends within the first year after their IPO.

The primary contribution of this study is to investigate the influential factors in the decisions of whether IPOs pay dividends and the timing of dividend initiation, which have theoretical implications for the relation between the IPO decision and dividend policy. First, my results can be related to information asymmetry and signaling theories. My results provide robust evidence that the level of underpricing is negatively associated with the probability of dividend initiation and the early dividend initiation. This result is in line with Michaely and Shaw (1994) who find that firms who underprice less tend to pay higher dividends. Kale, Kini and Payne (2012) also find the level of underpricing for dividend initiating firms is on average higher than that for non-dividend initiating firms using univariate method but this finding is not supported by their multivariate regression tests. The tests of Kale et al. (2012) may suffer from multi-collinearity which causes biased estimation since they include more than twenty variables in a single regression. I undertake a number of model verifications to reduce any similar risk. The negative effect of underpricing on dividend initiation cannot be explained by Allen and Faulhaber's (1989) IPO signaling high-quality IPO firms arrange low offer prices so that they are able to interpret future high dividends more favorably. Instead, this result is in line with the implication of the Dividend Discount

Model and Rock's "winner's curse" model (1986). Specifically, paying no dividends or postponing the dividend payment suggests that the information asymmetry is substantial, so the issuing firms would intentionally lower the offer price to compensate the uninformed investors.

Consistent with the dividend signaling theory, I show that managerial ownership is positively associated with the IPOs' propensity to pay dividends. This result is not in line with the findings in preceding studies such as Eckbo and Verma (1994), Lasfer (1996), Chen and Steiner (1999) and Faccio et al. (2001). But Kale, Kini and Payne (2012) also find the dividend initiating firms on average have higher managerial ownership than non-dividend initiating firms although their multivariate regression tests do not support this finding. My finding suggests that informed managers of high-quality IPOs tend to retain a large fraction of shares (Leland and Pyle, 1977; Ross, 1977) and wish to signal positive information by distributing dividends. Similarly, underwriter reputation is positively associated with IPOs' propensity to pay dividends. This result is comparable with Jain et al (2009), Kale et al. (2012) who find similar relation in univariate analysis. This finding implies that prestigious underwriters provide certification for "good" firms (Booth and Smith, 1986) who have strong motivation and capability to initiate dividends.

By contrast, my results show that VC backing has a negative impact on the propensity to pay dividends for IPOs, in line with Jain et al. (2009). Also, a strong negative relation between the length of full lock-up restriction period and dividend initiation inclination is found in my tests. Prior studies do not provide direct empirical evidence relating dividend policy to the lock-up covenant, with the exception of Brav and Gompers (2003) who find that the IPOs with longer than median lock-up length have lower frequency of dividend initiations than counterparts but the associated significance in their test is small. In information equilibrium, these results suggest that IPOs substitute their dividends for these factors as signaling device since these factors are shown in previous studies to mitigate the level of information asymmetries (Booth and Smith, 1986; Megginson and Weiss, 1991; Brav and Gompers, 2003; Espenlaub et al., 2001; Courteau, 1995; Brau et al., 2005). For example, we may argue that the information asymmetry would become more serious if no dividends are paid out and in such case the more restrictive lockup provisions will be required. Moreover, I find no evidence the institutional ownership has significant influence on the decision to initiate dividends of IPOs.

My results can be discussed in the context of agency costs theory of dividends. I develop the substitute assumption and complement assumption to interpret the link between dividend policy and corporate governance. The logic of substitute assumption is similar to that of the “substitute model” given by LaPorta et al. (2000) which implies that weak corporate governance leads to higher demand of dividend payouts. Rozeff (1982), Jensen (1986), Smith and Watts (1992), and Gaver and Gaver (1993) also follow the line of argument when they analyse the relation between two devices that can reduce agency costs. The logic of complement assumption is similar to that of “outcome model” of LaPorta et al. (2000) which implies that strong corporate governance leads to higher demand of dividend payouts. Both Fenn and Liang (2001) and Grinstein and Michaely (2005) follow the similar argument line. The results can be summarised as follows.

I find that that the propensity of paying dividends is negatively influenced by the full lockup restriction period, VC backing and managerial stock option provide support for the substitute assumption of agency costs which suggests that weak corporate governance leads to higher demand of dividend payouts (Rozeff, 1982; Jensen, 1986; Smith and Watts, 1992; Gaver and Gaver, 1993; LaPorta et al., 2000; Officer, 2006). For example, IPOs with longer lockup restriction periods find it less necessary to reduce their potential agency costs by paying dividends, because the lockup agreements bond the interests of directors and investors (Brav and Gompers, 2003). These results are in accordance with results from some previous studies. Jain et al. (2009) find that VC backing affects negatively the likelihood to initiate dividends. The documented negative effect of managerial options (*OPTION*) is consistent with findings reported by Smith and Watts, (1992), Yermack (1995), Weisbenner (2000), and Fenn and Liang (2001). Moreover, the finding in respect of managerial options is consistent with the argument of Lambert, Lanen and Larcker (1989) who suggest that executive stock options motivate managers to reduce dividends because they are not “dividend protected”. In contrast, the results regarding managerial ownership and leverage lend support for the complement assumption of agency costs which suggests that strong corporate governance accompanies higher dividend payment (LaPorta et al., 2000; Fenn and Liang, 2001; Grinstein and Michaely, 2005). Both proxy variables are positively associated with the inclination of IPOs.

My results also show the strong evidence that IPOs’ preference to initiate dividends is adversely influenced by the growth opportunities and technology intensity.

Furthermore, firms issued on AIM, a stock market for small and high growth firms, are more reluctant to initiate dividends relative to those issued on main market. These results are consistent with free cash flow hypothesis (Jensen, 1986).

My results can also be analysed in the light of lifecycle theory. I find that VC backing and lockup agreement have negative effect on the dividend policy of IPOs. These results are consistent with the life cycle theory in which mature firms are in a better position to pay dividends. Previous literature (Lerner, 1994; Gompers, 1995; Bergemann and Hege, 1998; Gompers and Lerner, 2000, 2003; Lee and Wahal, 2004; Cumming and Johan, 2008 and Krishnan, 2011) suggests that venture capitalists prefer to invest into early-stage companies that are small, young and technology-focused. Likewise, Brav and Gompers (2000, 2003) find that young firms are associated with longer lockup periods. The other explanation for the negative effect of VC backing can be that venture capitalists prefer short-term capital gains to long-term future dividends stream (Lerner, 1994 and Field and Hanka, 2001).

The results also show that large IPO firms with higher profitability and lower growth opportunities are more likely to initiate dividends and pay earlier, in line with previous studies (Fama and French, 2001; Bulan, et al., 2007; Denis and Osobov, 2008; Eije and Megginson, 2008; Ferris et al., 2009 and Kale et al., 2011). In addition, the findings that IPOs from high technological industry and AIM are reluctant to initiate dividend coincide with life cycle hypothesis since these firms are commonly considered as young and high growth. In addition, the positive relationship between dividends and leverage is consistent with life cycle hypothesis because high leverage may simply indicate that firms are in mature stage (Eije and Megginson, 2008). However, the negative relationship between R&D Expenditure and Capital Expenditures, and dividends that is consistent with the lifecycle hypothesis, can only be found in univariate analysis. Finally, IPOs issued in the years when markets put a price premium on dividend paying payers are more likely to become dividend payers and tend to initiate dividends earlier, consistent with the implication of catering theory (Baker and Wurgler, 2004).

Overall, common firm characteristics and IPO-related factors can affect corporate decisions of whether IPOs initiate dividends and of when IPOs initiate dividends through miscellaneous mechanisms. The most homogeneous results are associated with the life cycle theory and catering theories. There is also some empirical evidence in support of signaling and agency theory. The empirical tests do not negate any of the major dividend theories.

1.4.2 Chapter 4 – Determinants of Dividend Decisions at IPO Stage

The second empirical study, Chapter 4, contributes to investigating the determinants of dividend decisions at stage of IPO using hand-collected data from IPO prospectuses. In particular, the influence of the pre-IPO financial status on the preliminary dividend policy is examined. All the sample firms are classified into four control groups according to the decision makers' attitudes toward dividend payment. Specifically, in offering prospectuses, Type 1 firms declare the most positive dividend policies, stating that they would definitely start dividend payments after admission. Type 2 firms pursue a progressive dividend policy, but relative to Type 1 firms, they are more likely to default dividend payments if their financial status cannot reach the expected standard. Type 3 firms state that they will not declare a dividend in short or medium term, but they will continue to review the appropriateness of its dividend policy, and Type 4 firms even do not state any information about future dividend policy. One may argue that Type 3 firms resemble Type 4 firms in terms of their style of dividend policy. To mitigate the influence of this issue, I check the robustness of the results by using a different setting of dependent variables. Key firm characteristics are then compared between the groups using unique categorical analyses, cross-sectional binary logistic regression and ordinal logistic regression analyses.

In line with the previous chapter, the theoretically-based testable hypotheses are developed in the context of the main dividend theories including signaling, agency costs, life cycle and catering. In addition to the variables relating to pre-IPO financial status, most of the IPO specific characteristics used in Chapter 3 are retained as explanatory variables in Chapter 4. I expect the variables that are used in both chapters to have the same impact on IPO's dividend policy as they do in previous chapter. For example, in Chapter 3, high technological firms are hypothesized to have lower likelihood to pay dividends and delayed dividend payment. In Chapter 4, high technological firms are also hypothesized to undertake relatively conservative dividend policies at the time of IPO. My results demonstrate that the effects of underwriter reputation, VC backing, length of full lock-up restriction period, stock option, technology focus, selection of exchange (AIM), and dividend premium do not change when comparing with the results in Chapter 3. The findings for such factors are not reported below to avoid repetition.

The new findings in Chapter 4 are presented as below.

Relative to the counterparts with conservative dividend policies, IPOs with active dividend policies are more profitable, more likely to experience growth in earnings and to maintain positive earnings during pre-IPO period. All these results are strongly robust using various methods. This finding is particularly consistent with Lintner (1956) model in which dividend policy follows the shifts in long-run, sustainable levels of earnings and managers are expected to be highly prudent when initiating dividends in order to prevent from reversing dividend changes in future. These findings are also consistent with Miller (1987), Healy and Palepus (1988) and Benartzi, Michaely and Thaler (1997) who document that there is a strong link between changes in dividend policies and past earnings. In this sense, the dividend policy presented in IPO prospectuses signal the past financial performance of firms.

My results show that lower institutional ownership is associated with stronger propensity to choose relatively active dividend strategies for IPOs, in line with the expected relation derived from signaling by Kale et al. (2012). In detail, IPOs tend to express an intensive willingness of paying aftermarket dividends when the current level of institutional ownership is lower than what it should be, in order to attract informed institutions that prefer firms with dividend payments.

Additionally, the results from binary and ordered regressions show that the relation between the preliminary dividend strategy of IPOs and the level of underpricing is generally not robust. However, the results from univariate comparison are consistent with the hypothesis that issuing firms would compensate uninformed investors who are unable to extract sufficient information from released dividend policy by discounting offer prices. Similar to underpricing, an expected positive relation between managerial ownership and IPO's willingness to pay can only be found in univariate comparison.

My results show that IPOs with higher turnover ratio, higher cash flows and lower capital expenditures tend to choose more active dividend policies when going public, consistent with the predictions of free cash flow hypothesis (Jensen, 1986; Lang and Litzenberger, 1989; Grullon, Michaely and Swaminathan, 2002) and residual hypothesis. My results also show that IPOs with active dividend policies are more likely to experience growth in cash inflows and to maintain positive earnings during pre-IPO period, intensifying above finding. But, the evidence relating to leverage is mixed as the corresponding coefficient is only significantly negative in ordinal logistic regression rather than binary logistic regression. In addition, IPOs issued in the 'internet bubble' period opt for relatively conservative dividend strategies, and IPOs issued in 2000s are less likely to adopt active dividend policies than those issued in the 1990s.

Furhtermore, I find that Type1 IPOs have lower cumulative abnormal returns (CARs) to dividend initiation announcements compared with non-Type1 counterparts, supporting the conjecture that Type1 IPOs release sufficient information through dividend policies declared in offering prospectuses and therefore their formal dividend initiations fail to shock the market. While TYPE2 has the significant CARs over the major event windows, neither TYPE3 nor TYPE4 has the significant CARs in term of statistics. A possible explanation is that investors do not regard the dividend disbursement made by firms which are more likely technology focused companies (TYPE3 and TYPE4) as good news. I find that dividend-paying companies outperform non-dividend paying counterparts during three post-IPO years, indicating that non-dividend initiating IPOs rather than dividend-initiating ones account for the decline in long-run underperformance. The additional remarkable finding is that Type1 IPOs do not exhibit the expected declining long-run performance. The cumulative average market-adjusted returns for Type1 IPOs remain positive during the 36 holding months after IPO. Long-run performance descends orderly from Type1 to Type4 in the most of observed post-IPO months. This finding supports the argument that the dividend policies stated in prospectuses function to communicate the information, and thus reduce the possibilities that outside investors are overoptimistic over the prospect of the invested companies and that managers overstate the pre-IPO financial data at IPO stage.

Overall, my results suggest that common firm characteristics and IPO-related factors can affect dividend decisions of issuing companies at IPO stage through miscellaneous mechanisms of dividends. The most homogeneous results are associated with the life cycle theory. There is also some empirical evidence in support of signaling and agency theory. However, the evidence supporting catering theory is mixed. The empirical tests do not negate any of the major dividend theories although the evidence supporting the complement assumption of agency costs is relatively weak.

1.4.3 Chapter 5 – Trends in Dividend Payments: International Evidence

The third empirical chapter primarily contributes to examining the international trends in dividend payment across seven developed economies from 1989 to 2010. Meanwhile, I also provide relevant evidence on repurchase policy in order to provide a relatively complete pitcture of dividend decisions. this study goes further to investigate more dividend behaviors, including dividend increases, dividend decreases, dividend unchanged, starting dividend payments, terminating dividend payments, and dividend continuation. In analysis, more variables that are comprehensive are included to examine the determinants of dividend policy among international markets. The specific findings can be generalized as follows:

My study with the most recent data confirms some findings in the respect of the evolution of dividends and repurchases provided by previous studies. First, over the duration of the sample period, these sampled markets enlarged materially and the number of firms that paid dividends did not decline, except for in the UK. Second, the overall proportion of dividend paying firms falls significantly from 1989 through to the early 2000s, with the exception of Japan. After that, consistent with Julio and Ikenberry (2004) who find that dividends reappear in the US, the percentages of payers revert slightly upwards in the US, Canada, Japan and Hong Kong. However, the ‘reappearing dividends’ trend as described by Julio and Ikenberry (2004) is not evident in the UK, France, or in Germany. Third, in accordance with the findings of Grullon and Michaely (2002) and of Skinner (2008), share repurchases have taken over from dividends as the dominant form of payout by most US corporations, in terms of absolute amounts. The increasing importance of share repurchases can also be observed in the UK, while a large fraction of corporate payouts is still distributed in the form of dividends, consistent with Renneboog and Trojanowski (2011). Share repurchases only counted for a small fraction of corporate payouts in other countries including Canada, Germany, France, Japan, and in Hong Kong. Fourth, as previous studies (Denis and Osobov, 2008; Eije and Megginson, 2008; Ferris et al, 2010), the aggregate amount of dividends paid continuously increased in each country during the sample period.

In contrast, several findings about trends in dividend payment are innovative or not completely as same as existing evidence. First, the proportion of newly listed firms that pay dividends decreased in all countries between 1989 and 2010, supporting Fama and French (2001), and Denis and Osobov (2008) who attribute a reduction in the percentage of dividend payers to the soaring number of newly listed firms that do not pay dividends generally. Second, all countries retained stable dividend payout ratios and total payout ratios during the sample period. In general, the significant changes that were seen in percentages for dividend paying firms cannot be seen in respect of the evolution of payout ratios. This finding is comparable to Eije and Megginson (2008) but distinguishable from Ferris et al (2009) who measure dividend ratios differently.

As the initial step of examining the propensity to pay dividends, I use a vector of conventional firm characteristics as indicator variables of logistic panel regressions to investigate the determinants of whether companies pay dividends. The likelihood of paying dividends is positively related to firm size, profitability and earned equity. The finding of highly strong effect of earned equity supports DeAngelo, DeAngelo and Stulz (2006), and Denis and Osobov (2008), but contradicts Eije and Megginson (2008). In line with Denis and Osobov (2008), the evidence relating to growth opportunities is somewhat mixed. Market to book ratio and rate of change in total assets are not demonstrated to be significant and negative in all sample countries as expected. Moreover, consistent with Eije and Megginson (2008), leverage is an important influential factor having adverse effect for the decision to pay dividends for the majority of sample countries.

Controlling for the firm characteristics stated above, the declining propensity to pay dividends is confirmed in all sample countries apart from Japan. Both UK and Germany underwent greater turbulence in the propensity that pays dividends over the forecast period 1996-2010 compared with the US and Japan. Contrary to the conclusion of Denis and Osobov (2008), an implication of the test is that there should be unobserved factors influencing the dividend patterns because the actual percent of dividend payers are more volatile than the expected percent of dividend payers.

As suggested by some existent theories, some additional explanatory variables are used to explain: (1) the decisions of paying dividends; (2) the decisions of repurchasing shares; (3) the amount of dividends; (4) the amount of repurchased shares. The majority of variables have significant time trend. More importantly, explanatory variables also include M&A factors and delisting risk, which have not been considered in international research on payout policy. The most pronounced results are below.

Both the decision of paying dividends and the decision of repurchasing dividends are similarly affected by the conventional firm characteristics including firm size, profitability, growth opportunities, earned equity and leverage in general. The difference is that the repurchases regressions have smaller number of statistically significant coefficients than dividends regressions. These findings are similar to Eije and Megginson (2008). Older companies are in general associated with higher likelihood to pay dividend and repurchase shares. There is some evidence that cash holdings are negatively related to the decision to pay dividends but positively related to the decision to buy back shares, partially in line with the finding of Lee and Suh (2011). R&D expending is a factor with strongly negative influence on the propensity to pay dividends, however its effect on the propensity to repurchase dividends is diverse for different countries. Similarly, high technology intensity has generally negative influence on the decision of whether to pay dividends and mixed effect on the decision of whether to repurchase shares.

Fama and French (2001) conclude that M&A practices have no important impact on US markets over their sample period 1978-1999. My tests show that the effects of M&A on the incidences of payouts are highly heterogeneous in different countries; therefore, to look at this issue more clearly it would be better to concentrate more on the US and the UK in which a great number of M&A observations are available. The US acquirers appear to be reluctant to pay dividends probably because acquisition as a form of investment actually reduces the excess cash. In contrast, the opposite relation in the UK can be explained by the fact that acquirers have good financial conditions in a long-term period before they launch the M&A plans. I conjecture that the gap between the US and the UK in this issue might have resulted from the different frequencies of M&A. The target firms both in the US and in the UK are more likely to pay dividends. The possible explanation is that companies pay dividends when they lack positive NPV projects and thus confront increasing chance of being taken over. In addition, I find that acquirers in the US and in the UK are likely to have greater incidence of repurchasing shares, suggesting that they need some flexibility in the way they distribute cash to their shareholders. Relatively, there is homogeneous evidence that firms facing delisting risk have lower likelihood to pay dividends, in line with DeAngelo and DeAngelo (1990) and DeAngelo et al. (1992). Moreover, I find weak evidence that the payout decisions are affected by the market sentiment as argued by Baker and Wurgler (2004a). Moreover, I find that in most sample countries firms that repurchase shares tend to be dividend payers at the same time, suggesting that dividends are complementary not substitutes.

I use dividends ratios (cash dividends paid scaled by total assets) and repurchases ratios (share repurchased scaled by total assets) as dependant variables to examine the determinants of the amounts of corporate payouts. Once again, the repurchases regressions have smaller number of statistically significant coefficients than dividends regressions. Market to book ratio is the only explanatory variable that has significant effect on both the amounts of dividends and share repurchases. The associated coefficients of market to book ratio are positive and significant, in line with Aivazian and Booth (2003), Lee and Suh (2011), and Alzahrani and Lasfer (2012) who use dividends ratios or repurchases ratios as dependant variables as well. . I document a relation between cash holdings and the amount of dividends, similar to the findings of Lee and Suh (2011) and Eije and Megginson (2008). Another interesting finding is that large US companies are less likely to pay high dividends. Similarly, Aivazian and Booth (2003) also find a negative relation between firm size and dividend amount in several countries such as Korea, India and Turkey. This may imply that large US firms are distributing substantial amount of cash flows in the form of repurchases. On the contrary, firm size still positively affects the dividend amount of UK companies. In addition, I find that profitability, growth rate of total assets and retained earnings remain as the important factors in determining the dividends amount, and the associated signs are same as those in the decision of paying dividends.

I also examine the determinants of changes in dividends and share repurchases. I find that firms that increase dividends are larger, more profitable, and have higher growth opportunities, retained earnings as well as cash holdings than firms that do not change dividends and firms that decrease dividends. An interesting finding is that the number of high-tech dividend-increasing firms is greater than that of high-tech dividend-decreasing firms. This indicates that techonogy focused firms will experience the convertion from a non-dividend payer to a dividend payer. In the US, dividend increasing firms are more frequently be acquirers and less likely to be M&A targets within 3 years. Dividend-increasing firms have lower delisting rate. Overall, the most remarkable finding is that dividend-increasing companies have growth opportunities and cash holdings than dividend-decreasing companies. The only consistent evidence to catering theory is that the US dividend-increasing group has greater value-weighted dividend premium than dividend-decreasing group.

Firms that start to pay and firms that stop to pay differ in a series of life cycle related characteristics like firm size, growth opportunities and earned equity. This might be due to the age differences with the control groups. In addition, there are several robust findings. Firms that omit their dividends are likely toi have a higher leverage compared to firm that initiate dividends, confirming the expected opposite relation between leverage and dividends. Dividend iniating companies are more likely to be from technology industry, but less likely to delist. In the US, dividend iniating firms are more likely to experience M&A.

Using Lintner (1956) model, I find that the dependence of dividends on earnings has been going down across countries, in line with Skinner (2008) and Eije and Megginson (2008). In addition, US companies rather than companies of other countries actually speed up the adjustment of dividends within the recent two decades. The partial reason can be that repurchases account for larger proportion of corporate payout, especially play the predominate role in the US.

The transition matrices of payout channel suggest that corporate decision makers pursue stable payout channel. Dividends are long-term and stable while repurchases are relatively temporary. Dividends and repurchases are not perfect substitutes at least and they may serve as complements. The substitute relation of dividends and repurchases are prominent among the U.S. and Canada new payers that have not dividend history. Overall, for the US, share repurchase is essentially a substitute of dividend payout and actually predominant the corporate payouts. Share buybacks have become increasingly popular among the UK and Canadian companies, but dividend payment is still the most important payout channel. This implies that the surge of share repurchases plays a crucial role in shaping the dividends pattern of the US companies. Increasing share repurchases may also contribute to the recent dramatic decline in the incidence of dividend payers in Canada and UK. For other sample countries, the effect of repurchases on dividends is limited.

1.5 Structure of the Thesis

The Literature Review presented in Chapter 2 details the main dividend theories and empirical research relating to the research question and it will discuss the theories on which the principles of hypothesis testing is based for this research. Chapters 3, 4 and 5 comprise the three empirical studies. Chapter 3 focuses on the likelihood of IPOs to pay dividends and the timing of dividend initiation. Chapter 4 analyses the factors that drive IPOs to choose different dividend policies as stated in their offering prospectuses, and Chapter 5 studies trends in dividend payments across seven representative advanced economies. Additionally, Chapter 5 observes the role of share repurchases as an alternative payout method used by firms. The main findings and conclusions of the research are summarised and discussed in Chapter 6.

Chapter Two

Literature Review

2.1 Introduction

This chapter presents a comprehensive literature review on research related to corporate dividend policies. The systematic review of previous research not only helps clarify our current understanding of corporate dividend policy but also enlightens future research. Since the advent of seminal research, such as Lintner (1956), and Miller and Modigliani (1961), a great number of theoretical and empirical studies on dividend policy have been accumulated. Allen and Michaely (2003) and DeAngelo, DeAngelo, Skinner (2008) provide a review of the majority of prevalent dividend theories over the past 40 years. The literature review presented in this chapter only covers the perspectives that closely relate to the issues focused on by the thesis, rather than presenting a complete overview of modern dividend studies. Therefore, in order to focus on the impact of information asymmetries and agency costs, which are inherent in IPOs, I do not cover extensively nor test the effect of taxation.

This chapter starts by reviewing the seminal dividend studies that have extensively affected subsequent research. The next section considers in depth the most debated dividend theories. For each theory, the original theoretical models will be introduced, and then the main arguments critically presented. In the following section, the main empirical evidence will be reviewed. Finally, I summarize the important theoretical and empirical issues on this theory. The remainder of this chapter is organized as follows. Section 2.2 reviews seminal studies on dividend policy. Section 2.3 reviews information asymmetry. Section 2.4 reviews residual theory. Section 2.5 reviews agency cost and free cash flow hypothesis. Section 2.6 reviews life cycle theory. Section 2.7 reviews catering theory.

2.2 Seminal Studies on Dividend Policy

2.2.1 Lintner (1956)

Lintner (1956) interviews managers from 28 selected companies. He finds a number of important stylized facts underlying the decision to pay dividends, which can be summarized as follows:

a) Firms have long-term target ratios of dividend payout.
b) Managers focus more on dividend changes than on absolute levels.
c) Dividend changes follow shifts in long run, sustainable levels of earnings rather than short-run changes in earnings.
d) Managers are reluctant to make dividend changes that might have to be reversed.

He further built up a theoretical model of corporate dividend behavior that embodies these findings.

$$DPS^* = \gamma \times EPS \qquad (2-1)$$

$$DPS_t - DPS_{t-1} = \lambda(DPS^* - DPS_{t-1}) \qquad (2-2)$$

$$DPS_t = \alpha + (\lambda\gamma EPS) + (1-\lambda)DPS_{t-1} \qquad (2-3)$$

where γ is the target payout ratio, λ is the speed of adjustment towards the target payout ratio, α is a constant expected to be positive to reflect the propensity of firms not to cut their dividends. DPS and EPS are for dividend per share and earnings per share, respectively.

Equation (1) indicates that the target dividend is a function of the target payout ratio, as indicated in the survey results (a). Equation (2) states that changes in dividends should reflect the difference between the target dividends and the actual dividends that firm paid in the previous period. The target payout ratio is the long-term desired ratio of dividends to earnings. However, since firms adjust to their target through time, this difference is multiplied by λ, the speed of adjustment, which measures how quickly managers adjust dividends to close the gap in their dividend towards their target. If we rearrange Equation (2) we obtain Equation (3), which states that dividend at time t is a function of two main variables: earnings at time t and lagged dividends, and by two firm-specific parameters: target payout ratio and speed-of-adjustment.

This model has been extensively tested in many studies and the results are strong. (See Allen and Michaely (2003) for a review). Generally, Lintner (1956) incorporate two important implications. First, firms set long-term payout ratios so that current reported earnings determine the current dividend amounts and desired dividends are realized by partially adjusting dividend payment in each year. This finding suggests that the level of earnings is the most important determinant of change in dividends (Allen and Michaely, 2003). Second, firms are concerned with the stability of dividends. Managers tend to maintain conservative dividend policies and thus pursue dividend smoothing. In other words, the operated dividends are sticky, tied to long-term sustainable earnings, and smoothed from year to year (Brav, Graham, Harvey and Michaely, 2005).

A large number of subsequent studies provide strong support for this model. Amongst the earlier studies, Fama and Babiak (1968) use data for 392 major industrial firms over the period 1946 through 1964. They find that managers increase dividends only after they are reasonably confident with the earning level in the future. Subsequently, Kalay (1980) concludes that the dividend decision is a credible signal to stock market since managers are reluctant to cut dividends once they decide to initiate dividends or lift dividend payout ratio. Lasfer (1996) examine the impacts of taxation on dividend policy by incorporating tax exhaustion and tax discrimination variables into Lintner's (1956) model and find tax burden affects corporate dividend decisions while tax-induced dividend clientele is not evident. Furthermore, Allen, Bernardo, and Welch (2000) offer the other explanation to dividend smoothing. Dividend payments attract untaxed[13] institutional investors who have the relative advantage in detecting high firm quality and in maintaining the corporate governance, so that dividends are valuable to firm value from time to time. Thus, the action of cutting dividends may cause the loss in firm value since it may imply that firms paying dividends have the intention to reduce the institutional ownership. Brav et al. (2005) conduct the other field investigation by interviewing 23 listed firms and find managers still tend to avoid dividend cuts while the connection between earnings and dividends has weakened.

2.2.2 Miller and Modigliani's (1961) Dividend Irrelevancy Proposition

Prior to Miller and Modigliani (1961)[14], there was a lack of the literature of a complete and reliable theoretical model of the effect of a firm's dividend policy on the current price of its shares. MM (1961) are the first to challenge the belief that a higher dividend

[13] For simplicity, Allen, Bernardo, and Welch (2000) assume there are just two clienteles and call them "untaxed institutions" and "taxed individuals."
[14] Thereafter, Miller and Modigliani (1961) is referred to as MM (1961).

payout translates into higher firm value. They conclude that only investment policy rather than dividend policy determines firm value in an ideal economy. Dividend policy merely establishes a tradeoff between dividends at one date and dividends at another date because both the corporations and the individual investors can create any cash inflow stream by making homemade dividends. It means that any desired stream of payments can be replicated by appropriate purchases and sales of equity. Thus, investors will not pay a premium for any particular dividend policy.

The net payout can be considered as the difference between the wealth generated from preceding investment and the amount of capital required by the future opportunity of growth, and is simply a residual. Dividend irrelevancy proposition has the implication that firms should never give up a positive NPV project to increase a dividend since the investment policy of the firm is set ahead of time, and firm value is not changed by changes in dividend policy.

In order to grasp the spirit of MM’s (1961) dividend irrelevancy proposition it is necessary to understand correctly the basic assumptions of perfect capital markets, rational behavior, and perfect certainty. Dividend policy does not affect firm’s value, but it could matter when one of these assumptions is violated. In perfect capital markets, no participant (buyer, seller or issuer) of trading transaction has the power to control completely stock prices. There is no asymmetrical information on the traded stocks among the participants of stock trading. There are no transaction costs in any forms such as brokerage fees and transfer tax. There are no tax differentials between dividends and capital gains. The assumption of rational behaviour means that investors pursue wealth maximization all the time and view income in the form of dividend payment and capital gains as equivalents. The assumption of perfect certainty implies the analysis disregard the difference between stocks and bonds as financial sources.

The most important insight of MM (1961) dividend irrelevancy proposition is that it identifies the situations in which dividend policy can affect firm value. Hence, the MM (1961) framework has formed the foundation of subsequent work on dividends and payout policy in general. Each of imperfections might lead an investor to have a systematic preference between current dividends and current capital gains. But Miller and Modigliani also emphasis that such imperfections are at best only necessary but not sufficient conditions for certain payout policies to command a permanent premium in the market.

2.2.3 Black's (1976) Dividend Puzzle

In the post MM (1961) period, a large number of studies focus on how dividends in the real world behave when the conditions underlying the MM (1961) are relaxed. The major controversy emanates from the contradictory implications of these assumptions. While the information asymmetry and the agency costs will make dividends increase the value of the firm, the existence of the tax differential between dividends and capital gains will result in firms destroying value when they pay dividends.

This controversy led Black (1976) to discuss primarily two questions on dividend policy: Why do firms pay dividends? Why do investors buy stocks paying dividends? Miller-Modigliani irrelevance theorem suggests that a firm without dividend payments has the same value as it would have if it paid dividends under the conditions of frictionless world. However, this conclusion contradicts the fact we can observe in real world that firms pay many dividends. Why are announcements of dividend increases typically followed by stock price increases (Miller, 1986b)? Moreover, why are dividend cuts or eliminations often followed by price falls? Early studies of this phenomenon include Pettit (1972), Aharony and Swary (1980), and Asquith and Mullins (1983). The puzzle for MM's (1961) dividend irrelevance theorem is obvious: Why would stock prices react to dividend changes if payout policy is truly irrelevant?

With tax, the dividend picture appears to be more complicated since once one introduces payout taxes into an otherwise frictionless model in which payout policy is irrelevant, investors are always better off under a low or no dividends. Feldstein and Green (1983) echoed that it is questionable that companies pay dividends on condition that dividends are taxed more heavily than retained earnings[15].The transaction costs of selling shares cannot explain why dividends exist as the corporations can avoid such costs by buying back stocks. The dividend changes do not necessarily convey the forecasts of company's prospect. For example, the dividend cut does not indicate the future performance will degenerate, favors tax saving for stockholders instead. If a corporation omits its dividends, it has less needs of relatively more expensive external capital when high quality projects turn up. The assumption that increase in dividends hurts creditors is not reliable either because the negotiation mechanism between the corporation and creditors can help relief the potential conflict. In conclusion, Black

[15] Feldstein and Green (1983) state that, until 1982, the capital gains are taxed at rate below 40% while dividends are taxed averagely at 40% and up to 70%.

(1976) argues that the corporate policy of paying substantial dividends seems like a puzzle.

The existing literature advances several explanations for this puzzle. Various theories stipulate that factors such as taxes, information asymmetries, and contract incompleteness determine a firm's payout decision. The practice of distributing dividends may demonstrate that corporate payout policies do matter if the assumptions of perfect capital markets are relaxed.

2.3 Information Asymmetry and Dividend Signaling

2.3.1 Theoretical Models

As reviewed above, Lintner (1956) suggests that firms have long-term target ratios of dividend payout and that dividend changes follow shifts in long run, sustainable levels of earnings rather than short-run changes in earnings. This suggests that firms smooth their dividends. The implications of this model is that dividends act as a signal of past as well as future firm's prospects. Under the perfect capital market conditions described in the Miller and Modigliani (1961) dividend irrelevance proposition, all market participants have the same information about the firm, so a firm's dividend payments will have no effect on the value of the firm's stock. However, the absolute information symmetry does not exist in actual markets. The market imperfection of asymmetric information is the basis for the signaling theory of dividend policy. MM acknowledged that dividend changes influence stock prices and attributed this phenomenon to the "information content of dividends." stating:

"The dividend change provides the occasion for the price change though not its cause, the price still being solely a reflection of future earnings and growth opportunities." While the irrelevance of dividends can hold, the market has good reasons to measure the value of stock by taking account of changes in dividends because this indeed reveals earning information not previously known to the market.

Signaling models were first developed in the late 1970s and early 1980s. Akerlof (1970) explains the cost of asymmetry information by applying the market for used car as a pooling equilibrium in the absence of signaling activities. Next, using a scenario in the employment market, Spence (1973, 1974) carries out a formal partial equilibrium analysis of market signaling. Spence's (1974) signaling model has been extensively used by some researchers to study financial models of signaling. Ross (1977) develops a formal one-period incentive-signaling model in the context of capital structure; assuming that managers have private information about the firm's future cash flows. High-quality firms have an incentive to use leverage, as a signaling device to outsiders since increasing leverage brings higher market value with it. At the same time high-quality firms are capable of supporting a signal in the form of raising leverage. In contrast, low-quality firms do not have an incentive to send such a signal because managers are aware that a higher debt ratio is not sustainable and will eventually result in bankruptcy.

Bhattacharya (1979) structured a two-period signaling model following Ross' model (1977), showing that under conditions where outsider investors have imperfect information about firms' profitability and the tax rate is higher on cash dividends than capital gains, changes in dividends transmit the information of managements' views on future prospects to the market. In this two-period model, at the beginning of the first period, the firm announces that it will pay a high-level dividend at the end of this stage for relaying management's confidence in the forthcoming investment. If the project cannot realize the expected returns to cover the announced dividend payments during the first period, the firm is forced to finance externally to meet the dividend decision. After the dividends are paid, part ownership will be transferred to new shareholders who receive the payoffs generated by the firm at the end of the second period. Because issuing new securities is assumed costly, firms with less favorable investment projects will face higher expected financing costs for the same level of dividend payments. The transaction cost of new stock issue discourages the low-quality firm to imitate the dividend policy adopted by the high-quality firm. In line with Ross (1977), Bhattacharya's model (1979) contains the fundamental argument that dividend payment is a costly signal, and thus only good firms can afford to declare them. Therefore, firms with pessimistic prospects are not capable of using dividends to imitate such a signal, and investors readily bear a higher tax burden associated with dividends because they believe that a higher dividend rate puts a premium on firm value for an all equity-financed firm and the benefits of dividends exceed the tax disadvantage. Other studies (Rozeff, 1982; Eades, 1982; Crockett and Friend, 1988) also suggest that firms announcing higher dividends have to bear the risk of raising external capital and receiving the subsequent monitoring from external financial markets if the actual investment returns are not as good as initially expected.

On the basis of Ross's (1977) and Bhattacharya's (1979) framework of dividend signaling, Talmor (1981) developed a multi-period signaling equilibrium model in which several valuation parameters are included and in each period different financial decisions are determined simultaneously by taking into account both the intrinsic value of the firm and a real impact on the firm's cash flow. Talmor show that dividend payment plays the role of information device to signal a firm's future cash flow.

Hakansson (1982) contributes to the dividend-signaling framework by proposing three mutually exclusive conditions under which dividend policy is informative. These three conditions include heterogeneous beliefs among investors, an incomplete financial market and non-time additive utility. In this model, the informative function of dividends is pronounced. Myers and Majluf (1984) posit that insiders have superior information about the company's prospects and an incentive to release this information indirectly may be lacking through unexpected changes in dividend policy to convey this information to shareholders.

Miller and Rock (1985) construct a two-period signaling equilibrium model with the assumption that the firm's managers have superior information about the state of firm that outside investors do not have. In their model, at time zero firms invest in a project, the profitability of which cannot be observed by investors. Investors cannot observe either earnings or the new level of investment. At time 1, the project produces earnings and the firm uses these to finance its dividend payment and its new investment. Financing announcements with respect to earnings, dividends, and other financial changes are mutually related under the model's assumptions. They tie the question of dividend payout and external financing to the concept of net dividends, implying that both dividends and financing are opposing sides of the same topic. This concept views a financing announcement as a negative dividend announcement, while negative values of net dividends may be viewed as financing. They state that an unexpected change in earnings has the same impact on firm returns as an unexpected change in dividend payout. In addition, current dividend payment trends, rather than the dividend itself, are the basis of the market's future earnings projections. Unlike Bhattacharya (1979) in which the dissipative cost of signaling is the transaction cost of issuing new stock, In Miller and Rock's (1985) model dead-weight costs arise from a non-optimal investment policy. The payment of dividends uses cash that could otherwise be used for investment opportunities.

John and Williams (1985) developed a signaling model with multiple equilibria in an adverse environment where dividends are taxable. Managers are supposed to behave in the interest of current shareholders and possess superior information that outside investors do not have, retaining the true status of the firm. Under the framework of John and Williams' signaling model, only shareholders in firms that are sufficiently undervalued will benefit enough from their higher fractional ownership to make it worthwhile bearing the tax cost of the dividend payment. A "bad" firm will not find it profitable to mimic the actions of the "good" firm because shareholders will lose on the fractional share retained when the overvaluation is corrected. The model suggests that firms expecting higher future operating cash flows optimally pay higher dividends, and that the optimal dividend is larger when the tax disadvantage of dividends relative to capital gains is smaller. In equilibrium, increased shareholder tax liabilities and constrained firm liquidity that arise from paying higher dividends are offset by the increase in firm value. Firms with lower cash flow levels are expected to pay lower dividends. Dividend payments are costly to shareholders, who must pay tax on them. However, there are two benefits: (1) the shareholders sell their shares at a higher price, and more importantly (2), the shareholders maintain a larger fraction of the firm's equity.

John and Williams (1985) provide an answer to the question of why firms pay dividends, even when there are alternative methods of distributing cash to shareholders, such as share repurchases. They develop a model in which the personal tax disadvantage of dividends represents the "cost" of signaling the firm's future prospects to the market. John and Williams' model explains why firms do not repurchase shares to avoid taxes. The signaling tool must be costly. This model can also explain why firms sometimes pay dividends and issue new equity securities in the same period. In this case, dividends are used to reduce the underpricing of new securities issued to rise outside financing. The authors also point out that different tax brackets along with different demands of liquidity would induce stockholders to opt for dividends.

What is the relation between dividends and other information communication channels such as earning announcement? Further developing John and Williams (1987), Ambarish, John and Williams (1987) analyzed the role of dividends in signaling equilibrium and argued that, with the aim of maximizing the shareholder's wealth, optimal signaling equilibrium must minimize the signaling cost through an efficient mix of different signal instruments such as dividend policy, earning announcements, investment announcements, share buybacks, and equity issues. There is a trade-off between different signaling mechanisms. For example, as long as the cost of paying dividends is more than using earning announcements then dividend payment should be rejected. Myers (1977) argues that announced dividend policy reflects the managerial discretion on future earnings compared with earnings announcements so the market is more likely to absorb dividend information rather than earning information as an efficient signal. Hausch and Seward (1993) propose that the absolute risk aversion conclusively affects firms' choice between two common forms of cash disbursements: dividends and repurchases. They show that the relative cost of a stochastic disbursement; repurchases, is lower for firms with decreasing absolute risk aversion since more internally generated funds are available. In contrast, the low quality firms prefer to choose a deterministic disbursement, dividends, due to their increased risk aversion.

To sum up, the prominent dividend literature (Bhattacharya (1979), Miller and Rock (1985), John and Williams (1985) explains the mechanism by which dividends can be utilized by "good" firms to differentiate themselves from "bad" firms. In other words, as John and Williams commented, "In a repeated game with reputations, dividends might reveal corporate characteristics to outsiders, completely or partially, with or without dissipative costs". Managers of dividend paying firms are confident of returning sustaining cash flows to shareholders even though they burden the costs of possible external financing, underinvestment and higher tax rate. In contrast, less successful firms cannot afford the costs that dividends generate. The investors accept dividend payment as a kind of credible signal, ensuring future profitability and stability because they believe that managers intentionally choose a costly way of distributing surplus cash in order to convey favorable interior information. More importantly, corporate managers and investors who bestow a privilege upon dividend payments hold the viewpoint that the disadvantage of the dividend can be offset by the increase in capital gains in signaling equilibrium. Allen, Bernardo and Welch (2000) provide an innovative approach to looking at the signaling role of dividends. Under their model, institutional investors are assumed to prefer dividend-paying stocks because of the advantage of dividend tax and the restrictions under prudent man rules. Good firms like to pay dividends in order to attract institutional investors who are better informed and are more likely to disclose firm quality. Low-quality firms do not like their true firm value to be revealed by institutional investors, so they endeavor to avoid dividend payments. Therefore, high-quality firms opt for paying dividends to convey information on their value to market by adjusting the investors' structure.

2.3.2 Empirical Evidence

The dividend signaling hypotheses lead to three important implications that have been extensively tested in literature (Allen and Michaely, 2003). First, dividend changes should be followed by subsequent earnings changes in the same direction. Assuming the firm's investment is given, dividend announcements may convey information about current earnings and even about future earnings. On condition that the level of corporate earnings has not been completely unveiled, the managerial signaling theory predicts that shareholders usually react positively to the announcements of dividend increases and initiations, and negatively to the announcements of dividend decreases and omissions. Second, unanticipated dividend changes should be accompanied by stock price changes in the same direction. The abnormal returns of shareholders can tell us whether the market absorbed the information contained in the dividend change. Third, the market participants should revise the market's expectations of future earnings in the same direction as the dividend change. The first prediction that earnings changes will follow dividend changes is the most fundamental expectation to verify the signaling hypothesis. The remaining two predictions concentrate on how the market will react to information on dividends and shed more light on the efficiency of informational conveyance. Thus, if no evidence about the positive relation between dividend changes and following earnings can be obtained, we cannot decide the potential of dividend signaling.

(1) The Relationship between Future Earnings and Dividend Changes

Researchers have tried to find evidence that dividend increases are reliable signals of future earnings increases. Watts (1973) find no significant relationship between current unexpected dividend changes and future earnings during the period of 1946-67. Gonedes (1978) reaches the same conclusion. Penman (1983) also finds that after controlling for management's future earnings forecast, there was not much information conveyed by dividend changes *per se*. Interestingly, Penman also reports that many firms with improved future earnings did not adjust their dividends accordingly.

Benartzi, Michaely, and Thaler (1997) and Benartzi, Grullon, Michaely, and Thaler (2002) do not find any significant evidence that dividend changes contain information about future earnings growth. Benartzi, Michaely, and Thaler (1997) find a clear pattern of earnings increases in the two years following the dividend cut, and dividend omissions tend to be followed by earnings increases, contrary to the signaling hypothesis. Healy and Palepu (1988) find similar results, but Benartzi et al. (1997) also find that firms that increase dividends are less likely to experience a decline in future earnings than firms that do not increase them, and the year 1 and year 2 earnings changes are not statistically influenced by the change in dividends at year 0. Using a sample of firms that changed their dividends by more than 10%, Grullon, Michaely and Swaminathan (2002) negate the implication of the signaling hypothesis by showing that not only do future earnings not continue to increase, but that the level of firms' profitability decreases in the years following announcement of dividend increases.

DeAngelo, DeAngelo and Skinner (1996) examined 145 firms whose annual earnings growth declined in year zero, after at least nine years of consecutive earnings growth. Managers who expect the growth stoppage to be temporary should have strong incentives to use dividend increases to assuage investors' justifiable concerns about future earnings. Their test focused on the year zero dividend decision, which could have conveyed lot of information to outsiders by helping the market to assess whether the decline in earnings was permanent or transitory. They show that dividend changes are not useful in predicting future earnings changes, even in situations where signaling motives are strong. The dividend-increasing firms did not experience positive earnings surprises in subsequent years in absolute terms, and their earnings performance was no better than those firms that did not change their dividends. Overall, there was no evidence that dividends had provided a useful signal of future earnings.

The view that dividend announcements convey information about the persistence of earnings changes is thus well supported qualitatively, although the quantitative impact of dividend increases on earnings persistence remains an open question. The results reported by Brickley (1983), Guay and Harford (2000), Jagannathan, et al. (2000), Koch and Sun (2004), and Lie (2005a) are consistent with this view. Although Brickley (1983) finds significant earnings increases in the year of and the year after the dividend increase, his results are not strong in sense of statistics because they are likely to suffer from sample selection bias as they are based on only 35 firms that increased their dividends by more than 20%. Most notably, somewhat more in line with the theory are Healy and Palepus' (1988) results. For their sample of 131 firms that initiated dividend payments, earnings had increased rapidly in the past and continued to increase for the following two years. However, for their sample of 172 firms that omitted their dividends, the results are not in line with what signaling theory predicts. Earnings declined in the year in which the omission announcement took place, but then improved significantly in the subsequent years.

Nissim and Ziv (2001) offer yet another look at this problem by showing that dividend changes are positively related to earnings changes over a two-year period subsequent to the dividend change once “normal” earnings are adjusted for mean reversion in reported profits. They add the ratio of earnings to the book value of equity as an additional explanatory variable for improving the expectation of earnings. Furthermore, they test for robustness by using dividend changes that occur in the first quarter of year t+1. The dividend coefficient becomes significant in about 50% of the cases when next year’s earning is the dependent variable. When they use the more conventional methodology, it is significant in only 25% of the years.

Grullon, Michaely, Thaler, and Benartzi (2005) find that dividend payment is not the useful signal of future earnings when normal earnings are estimated using the partial adjustment model of Fama and French (2000) rather than a model with a uniform rate of mean reversion, such as Nissim and Ziv’s (2001). This conclusion is confirmed by Michaely and Roberts (2012) using a sample of UK firms. DeAngelo et al. (2009) comment that “Our view is that Grullon et al. (2005)’s conclusion is the more reasonable one, and not just because Nissim and Ziv’s findings are not robust to the functional form of mean reversion. Simply put, if investors must conduct sophisticated statistical analyses of linear versus nonlinear reversion patterns to isolate the signaling content of dividend changes, then dividend changes are surely not an effective communication device.” Therefore, the overall accumulated evidence does not support the assertion that dividend changes convey information about future earnings.

The relation between dividend changes and the post and current financial performance may be more interesting and important for both the corporate finance and the market efficiency perspectives. Benartzi, Michaely, and Thaler (1997) point out that, according to Lintner (1956), changes in dividends depend on current and past earnings. Miller (1987) and Benartzi, Michaely, and Thaler (1997) support the view that dividends are better described as lagging earnings than as leading earnings. Using a sample period 1947-1967, Charest (1978) finds an abnormal performance of around 4% in the year prior to the dividend increase month and a negative 12% for the dividend decreasing firms[16]. Healy and Palepus (1988) find that earnings increase both before and after dividends initiation. Benartzi, Michaely, and Thaler (1997) document the significant increases in earnings in the years prior to dividend increases and the significant decreases in earnings in the years prior to dividend decreases. In addition, Garrett and Priestley (2000) provide evidence that dividends convey information about positive changes in current permanent earnings rather than future permanent earnings as the information of future earnings growth is captured by the changes in lagged stock price. Koch and Sun (2004) provide empirical results showing that dividend increases are overwhelmingly preceded by earnings increases but by contrast the chance that dividend decreases follow earning increases is very low.

(2) The Relation between Market Reactions and Dividend Changes

Early studies lend support to the signaling rationale that the information content of dividends is reflected in the movement of stock price, as the announcements of dividend increases precede significant price increases and that announcements of dividend decreases precede significant price decreases. For example, Pettit (1972) shows that the price shifts are observed prior to the announcements of dividends, which was a result of market imperfection regarding insiders' action. Charest (1978) finds that the announcement of a dividend increase generates excess returns of about 1%. But his study does not necessarily suggest what the information content of dividends is, since it does not preclude the effect of contemporaneous earnings announcements. Aharony and Swary (1980) overcome this shortcoming; they find that in cases where earnings announcements follow dividend announcements, the average abnormal return is 0.36% for announcements of dividend increases and -1.13% for dividend decreases. Stock prices are positively related to dividend announcements after controlling for contemporaneous earnings announcements, indicating that dividend payment conveys information that is not entirely contained in published earning information. In addition, their study supports the efficient market hypothesis; that dividends provide information to stock market and affect stock price. Grullon, Michaely, and Swaminathan (2002) investigate a sample that consists of large dividend changes of more than 10% and provide supportive results for the dividend signaling model that the average abnormal return to dividend increases is 1.34% and the average abnormal market reaction to

[16] They also find a 4% abnormal return in the two years after dividend increase announcements and a negative 8% for dividend-decreasing firms.

dividend decreases is 3.71%. Using the Fama-French three-factor model Grullon, Michaely and Swaminathan (2002) report three-year significant abnormal returns of 8.3% for dividend increases. They did not detect any abnormal performance for dividend-decreasing firms.

Not surprisingly, the post-dividend abnormal performance is even more pronounced for initiations and omissions. Michaely, Thaler and Womack (1995) reported a market-adjusted return of almost 25% in the three years after initiations and a negative abnormal return of 15% in the three years after omissions. Assuming that both dividend initiations and dividend omissions represent extreme changes in dividend policy, stock markets should have more dramatic responses to announcements of dividend initiations and dividend omissions than to announcements of dividend increases and dividend decreases. Asquith and Mullins (1983) argue that dividends' effects should be most visible at initiation since initial dividends are more likely to be unexpected than normal dividend changes. If this is the case, the market reaction on announcement day of dividend initiation should fully reflect the effect. Their sample consists of firms that did not pay dividends for at least 10 years. The majority of firms exhibit a positive market reaction to the announcement of initial dividend. The 2-day excess return is +3.7% and t-statistic is 6.59. This result is comparable to the returns reported by other studies that focus on dividend initiations. For example, Healy and Palepu (1988) report two-day excess returns of 3.9 percent, and Michaely, Thaler, and Womack (1995) find three-day excess returns of 3.4 percent. The market apparently views the announcement of an initial dividend as good news regarding firms' future prospects.

Bernheim and Wantz (1995) designed a tax-based method to investigate the market reaction to dividend changes. The underlying logic is that during periods when the relative taxes on dividends are higher than taxes on capital gains, paying dividends is more costly and therefore there should be a larger market reaction to dividend. All conditions being equal, when higher taxes are associated with dividends, the signal role of dividends is more distinctive. Bernheim and Wantz obtained favourable results for the signaling hypothesis in their empirical test. Using robust nonparametric techniques, however, Bernhardt, Douglas, and Robertson (2005) do not support the hypothesis of dependence between the tax regime and the excess returns associated with a given change in dividend signal. The tax-based signaling models cannot explain the dividend policy choice of firms. Furthermore, using data from six years before and six years after the Tax Reform Act of 1986, Grullon and Michaely (2002) find that the market responded much more positively to dividend increases when dividend taxation was lower (after the tax change), a finding that is inconsistent with tax-based signaling theories.

The above empirical results show that the market potentially has an asymmetric response to dividend increases and decreases (and for initiations and omissions), which implies that lowering dividends carries more informational content than increasing dividends, perhaps because reductions are more unusual, or because reductions are of a greater magnitude. This argument maybe provides a sensible explanation for Lintner (1956); that firms prefer to maintain a relatively stable dividend level and manage to avoid cutting dividends.

(3)The Effect of Dividend Changes on the Market's Expectations for Future Earnings

Different to previous studies that attempt to exploit price reactions to announcements of changes in financial policies, Ofer and Siegel (1987) develop analyst forecasts as a proxy for market expectations of earning. Using 781 dividend change events, they find that either the size of the unexpected dividend change or the change in stock price surrounding the announcement help reduce forecast errors for forecasts made before dividend announcements. Consistent with Ofer and Siegel (1987), Denis, Denis, and Sarin (1994) find that the median analysts revise forecast of annual EPS following dividend changes. However, both these studies fail to eliminate the effect of unexamined interim earnings disclosures surrounding dividend announcements, which could interfere with the effect of dividend policy. Controlling for the information conveyed by current earnings, Carroll (1995) develops a method to examine the role of dividend changes in information signaling. The relationship between stock returns and earnings forecasts' errors following dividend announcements shows that dividend announcements convey information to the market about earnings in the next quarter and the quarter one year after, but are not consistent with dividends revealing new information about the variance of future earnings.

Building up a sample that consists of 429 announcements of dividend change of more than 10%, Lang and Litzenberger (1989) conducted an empirical test applying analysts' forecast of future earnings as measurement of market reaction. They find that dividend changes do not affect significantly the analysts' earnings forecasts. These results are inconsistent with the predictions of the cash flow signaling hypothesis. In contrast, Yoon and Starks (1995) find that dividend change announcements are associated with revisions in analysts' forecasts of current earnings in a manner generally consistent with the cash flow signaling hypothesis.

(4) Survey Evidence of Dividend Signaling

In his field study, Lintner (1956) did not present survey results that showed directly that managers consciously use dividend policy to signal future free cash flows to outside investors. Almost half a century later, Brav, Graham, Harvey, and Michaely (2005) documented that there is a lack of support for the notion that managers use dividends as a costly signal tool to convey favorable information about asset valuation to the market. CFOs emphasized that a comparably more advantageous signal tools than dividend announcements are earnings announcements and direct conveyance to other market participants. Therefore there appears to be a gap between the managers' responses and the perception in primary dividend signaling models, although Baker (1999) and Baker, Powell and Veit (2002) show that managers of NYSE and NASDAQ accept the conception that dividend policy influences the asset valuation and that paying dividends signals future earnings prospects. The results of Allen's (1992) small-sampled survey in the US confirmed the dividend signaling mechanism.

In addition to the US based surveys, there are some surveys about corporate executives' attitude toward managerial signaling hypothesis in other countries. Lasfer (1997) inquired into the motivation for paying scrip dividends by UK companies. The majority of managers felt that scrip dividends signal future growth in earnings and dividend increases. Nevertheless, the large proportion of respondents did not agree the payment of scrip dividends increases the market value of firms. Dhanani (2005) surveyed the views of British financial managers on corporate dividend policy and found evidence for companies utilizing dividend changes, together with other potential informational tools, as a signal to convey inside information.

2.3.3 Summary

Lintner's (1956) model implies that dividends act as a signal of past as well as future firm's prospects. Unlike an assumption in Miller and Modigliani (1961), the real markets are not perfect actually. One of the examples is that the information sets of various market participants are not balanced. When managers have more inside information about a company than outside investors, they can communicate information by paying dividends because only high quality firms have the ability to afford the costly dividends (Bhattacharya, 1979; Miller and Rock, 1985; John and Williams, 1985).

In general, the extant literature has not reached a consensus on dividend signaling equilibrium (Allen and Michaely, 2003). First, the overall evidence does not provide strong support for the assertion that dividend changes convey information about future earnings. The absence of positive association between dividend changes and future changes in earnings raises serious questions about the validity of the dividend signaling models as this relationship is central for dividend signaling. Second, the studies on the market reaction to dividend announcements yield results in accordance with information signaling hypothesis. That is, stock prices go up (or down) after the increases (decreases) in dividends. Stronger price effects are associated with dividend initiations and omissions. Third, a great number of empirical tests document that analysts revise their predictions on earnings in the same direction with changes in dividends, with the exception of Lang and Litzenberger (1989) who find results consistent with the investment opportunity hypothesis. Finally, field surveys yield relatively mixed empirical results. Therefore, the overall empirical results on dividend signaling are not homogeneous.

Furthermore, dividend signaling can be questionable for the following aspects. First, smaller and/or younger firms are more likely to encounter information asymmetry (Mougoue and Rao, 2003; Mozes and Rapaccioli, 1995). However, previous empirical investigations show that established firms rather than newly listed firms make the majority of payouts (Fama and French, 2001; DeAngelo, DeAngelo, Skinner, 2004, Denis and Osobov, 2008; Eije and Megginson, 2008), contradicting the prediction of signaling logic. Second, signaling rationale is not appropriate to explain the practices of dividend cut and omission. DeAngelo, DeAngelo and Skinner (2009) argue that it is not reasonable for managers to use dividend cuts to signal their negative views on future performance. Therefore, managerial signaling hypothesis is at best a partial interpretation of the corporate dividend policies.

Nonetheless, previous studies did not negate the hypothesis that dividends carry inside information about corporations. Preceding literature shows the evidence that dividend policies merely reflect the past and current company performance before announcement. In addition, it is possible that the past and current company performance determines the changes in dividends and will continue in the same direction for a period after the dividend changes. Moreover, dividend signaling can become more puzzling when we consider further potential informational devices. Managers to reinforce or undermine other communications such as earning announcements, advertising and direct discussion with investors can use dividend policies. For example, when examining the market reaction to dividend announcement, researcher must be careful to control the effect of earnings announcement.

2.4 Residual Theory

2.4.1 Theoretical Models

DeAngelo and DeAngelo (2006) point out that a key implication of MM's (1961) dividend irrelevance model is that firms pay out as dividends all cash flows after financing all profitable investments. The residual dividend strategy supports flexible dividend payouts. In this theory, the dividends are the remaining segment of earnings after corporations meet all the project capital needs. In case the future profitable projects have not been fully financed with internally generated fund, corporations have the options to lessen dividends or pay no cash dividends.

The attractiveness of residual dividend strategy is to the great degree companies may avoid the compelling external financing resulting from executing invariable dividend policies in which a portion of cash flows have to be disgorged out regularly even if internal funds are not sufficient. In the pecking order theory developed by Myers (1984), and Myers and Majluf (1984), there is a financing hierarchy such that firms prefer internal finance to external finance and, within external financing, debt finance over equity finance, because of transaction, information and monitoring costs. In the process of external financing, the value of corporation can be reduced because the issuing new stocks will be costly. Fama and French (2002) develop formally a prediction that dividends are attractive to firms with profitable investments and less growth opportunities because of the tendency to avoid expensive external finance in the light of pecking order theory. Moreover, Clatworthy and Peel (2007) suggest that companies may be obliged to disclose 'confidential' information if they have to raise external capital.

An issue with respect to residual dividend theory is that it implies that dividends must be volatile because both earnings and the capital budgeting vary from year to year. This theory implies also that mature companies will pay dividends as they are likely to have excess cash given their low investments, and conversely, growth firms will pay low or no dividends, as they need to use the cash for investments. While these last two implications are not controversial as dividends are found to be negatively related to firms' growth options (e.g., Fama and French, 2001), previous studies show that dividends are not volatile but they tend to increase steadily through time and they do not follow strictly annual changes in earnings. Under this theory, it is also difficult to predict dividends as both earnings and investment needs follow random walks, particularly for firms that are not at maturity stage. This is different from the findings of Lintner (1956) that firms set long-term payout ratios and pursue dividend smoothing. Moreover, the signaling hypothesis implies that, under the residual theory, a payment of dividends can signal a lack of investment opportunities. As results, the abnormal return at announcement date will be negative.

However, the residual theory is appealing under the agency theory framework. The agency costs hypothesis implies that under the residual theory, dividend payouts contribute to firm value, as Jensen (1986) suggests that excessive free cash flow may produce agency costs, which will be imposed on shareholders because managers possibly do not behave as the best stewards of investors. Surplus funds provide chances for managers to spend money without restraint and therefore destroy the assets of firm. Jensen's agency theory based on free cash flow hypothesis leads to the justification that firms should pay out all residual cash flow to remove a major source of temptation from managers to overinvest and consume excessive perquisites and avoiding the consequent value destruction. Easterbrook (1984) suggests that frequent dividend payments force firms to finance externally. The investment banker or other creditors will closely look at the actual status of the firms when new securities are issued, acting as a monitor for their own interests. Paying out dividends help reduce the agent costs since the improved monitoring disciplines managers to operate in the way of value-maximizing. Overall, agency theory leads to a prediction that disgorging the free cash flow to investors as dividends is propitious for reducing agency costs and in turn adding value to firms.

The level of corporate managerial governance may be the other influential factor pertaining to residual dividend policy. One hypothesis is that firms with low shareholder rights and excess cash are vulnerable to overinvestment problem and will possibly have lower profitability and valuations. In order to prevent poor governance structure from being exposed to the market, in high-investor-protection environment, managers should spend cash quickly on acquisitions and capital expenditures and then disgorge the residuals to shareholders, rather than hoard it. On the contrary, in low-investor-protection environment, managers would deliberately remain more cash for their own interests (LaPorta, Lopez-de-Silanes, Shleifer and Vishny, 2000).

Flexible dividends may also serve to optimize firms' capital structure (Megginson, 1997). According to Smith and Warner (1979), leveraged firms are often constrained to conduct dividend payments due to debt covenants even in the short run. Bradley and Roberts (2004) report that 85 percent of the private debt issues they examine have dividend restriction covenant. Lenders are likely concerned with dividend payments as the risk they bear will increase as dividend payouts increase.

2.4.2 Empirical Evidence

Residual theory of dividends predicts that dividends are affected negatively by investment. Consistently, Alli, Khan, and Ramirez (1993) find evidence consistent with a negative relation between firm capital expenditures and dividends. Slater and Zwirlein (1996) find, within a sample consisting of S&P 400 Industrial Index firms between 1986 and 1989, that dividend payout is negatively related with investment. However, Elston (1996) provides evidence that the relation between dividend and investment policy is relatively weak for large U.S. firms from 1975 to 1988.

Lang and Litzenberger (1989) show that the market reacts to dividend declarations in the context of the firm's investment opportunity set. They use Tobin's Q ratio to measure overinvestment. The argument here is that firms with Q<1 have low grow opportunities, thus high agency conflicts (Jensen, 1986), while high Q are high growth, low agency conflicts. According to Jensen's (1986) free cash flow hypothesis, dividend increases make overinvestment problem less serious and boost firm value accordingly. Therefore, Q<1 firms should have greater abnormal returns on dividend announcements than Q>1 firms. The empirical results provided by Lang and Litzenberger (1989) are consistent with the overinvestment hypothesis that dividends credit to controlling agency problem. During sample period of 1979-1984, the difference in the average daily returns at dividend announcement days between Q <1 firms and Q>1 firms (e.g., (Q<1)-(Q>1)) is 0.8% and p-value is less than 1%. During the alternative sample period of 1982-1984, the difference is 1.79% and significant.

However, using a larger sample from 1969 to 1988, Yoon and Starks (1995) find no evidence that the abnormal return for low-q firms is significantly larger than that of high-q firms after controlling for dividend change, dividend yield, and firm size. They also find that the capital investments increase (decrease) for three subsequent years after dividends increase (decrease), inconsistent with the prediction of free cash flow hypothesis. Contrary to Yoon and Starks (1995), Grullon, Michaely and Swaminathan (2002) report that capital expenditures decrease significantly in the years after large dividend increases from 1967 to 1993, suggesting that companies increase their dividends when they reach a maturity stage. Fama and French (2001, 2002) provide evidence that dividend payouts are more favorably linked with higher profitability and less investment opportunities, consistent with the predictions of pecking order theory and residual dividend policy.

Survey studies (Baker and Powell, 1999; Graham and Harvey, 2001; Brav et al., 2005; Dhanani, 2005) of dividend policy reported relatively more affirmative evidence than market data analysis. Most of the respondents, corporate financial managers, express the explicit disagreement that dividend is the residual after investment policies and financial policies have been made. The main responses state firms maintain a target dividend per share or growth rate per share and go to great length to avoid large change in dividend policy, especially dividend omission. Only a minority of surveyed firms view cash dividends as a residual after funding desired investments from earnings (Baker and Smith, 2006).

2.4.3 Summary

The residual dividend strategy suggests that the dividend payments are made from the equity that remains after all the project capital needs are met. The residual dividend strategy has the advantage of avoiding the compelling expensive external financing. However, under the residual dividend policy, dividends are volatile. This is different from the findings of Lintner (1956) that firms have target payout ratio and prefer stable dividend policy. Under the residual theory, a payment of dividends can manifest a lack of investment opportunities. As results, abnormal return for the dividend announcement is going to be negative. However, on the other hand, dividend payout contribute to firm value since the agency cost of free cash flow, which will be discussed on the following, is reduced.

2.5 Agency Costs

Miller and Modigliani (1961) propose that, in frictionless environment, the choice between cash distribution and retention will not affect substantially the firm value, and only investment decisions matter. However, in the real world the conflicts of interests among managers, stock shareholders and debt holders may hurt the firm value. Dividend policy will be relevant if it affects substantially these conflicts of interest.

Traditional residual theory of dividends suggests that dividends distributed are the residual funds after making investment decisions. However, residual theory and free cash flow theory are not identical in essence. Free cash flow theory highlights that distributing surplus funds will increase firm value by reducing agency costs and. In contrast, in light of residual theory, the dividend increases (initiations) indicate profitable investment projects are not sufficient and accordingly negative market reaction is possible. In the next section, I will discuss the impact of dividends on the resolution of agency problem.

2.5.1 Manager-shareholder Conflict

The conflicts of interest on the free cash flow may exist between managers and shareholders. Jensen and Meckling (1976) explicitly describe the occurring mechanisms of agency conflict. As agents, managers are conferred the authority of operating assets on behalf of principals (shareholders and/or bankers) with the commitment to maximize principals’ wealth. However, in reality managers are not perfect agents as sometimes, they are likely to allocate firm’s resources to benefit themselves rather than the shareholders or creditors. The manager-shareholder conflict emerges in the agency relationship as long as the original inside owner(s) sell off a part of stock shareholdings to outside shareholders. As suggested by various previous studies (e.g., Jensen and Meckling, 1976), the separation of ownership and control bring about the interest collisions. Intuitively, the costs of agency conflict can be measured by the discrepancy between the values of firm when the majority of ownership is in the hands of insiders or blockholders compared to when ownership is dispersed. In order to minimize the incidence of agency conflict and the subsequent loss in fortune, principals can take preventative measures in pecuniary as well as non-pecuniary means. Jensen and Meckling (1976) argue that the activities in solving agency problem incur three kinds of costs: the monitoring expenditures[17], the bonding expenditures[18] and the residual loss[19].

Rozeff (1982) argues that dividends help address the agency issue of equity. If the earned capital does not fluctuate, the regular dividend payouts will force managers to raise capital by external financing. Thus, the new capital supplier and existing shareholders are accessible to the management genuine intentions. At same time, dividend payments increase the transaction cost of raising external capital. Hence, the dividend paying firms gain a benefit that is equal to the discrepancy between the agency cost borne by shareholders and the transaction cost of reissuance resulting from dividend distribution. An optimal dividend policy intends to maximize the sum of agency costs and transaction costs of raising external capital.

In line with Jensen and Meckling (1976) proposition, Easterbrook (1984) claims that one form of agency cost is the monitoring of managers, and the other is the risk aversion of managers who are inclined to bypass risky projects with higher expected returns because their personal wealth is usually in combination with companies' performance. They will be encountering punishments like redundancy if the risks become out of control. While shareholders would like the managers to take risks so as to expand profit margin, creditors would have the opposite preference because they bear the large part of incremental risk but will not share the profits. Easterbrook specify why dividends payments help alleviate both agency costs. For the monitoring cost, Easterbrook proposes an argument similar to Rozeff (1982) that dividends create a comparable pressure on managers who are compelled to issue new securities when internal funds are distributed as dividends. In the process of external capital sourcing, investment bankers[20] and other relevant capital market participants (e.g. securities exchanges and capital suppliers) will actively monitor managers' behavior for shareholders' interests. For this reason, dividends essentially reduce indirectly the cost associated with monitoring. For the issue of risk aversion, Easterbrook argues that the firm may adjust the debt-equity ratio by issuing new equity and thus the conflicts of

[17] The principal can limit divergences from his interest by establishing appropriate incentives for the agent and by incurring monitoring costs to limit the aberrant activities, of the agent.
[18] In addition, in some situations it will pay the manager 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.
[19] The dollar equivalent of the reduction in welfare experienced by the principal due to this divergence is also a cost of the agency relationship, and it is referred to as the "residual loss".
[20] The monitoring role of investment bankers in new equity issues has been stipulated by Bhagat (1986), Smith (1986), Hansen and Torregrosa (1992) and Jain and Kini (1999).

interests between debt holders and equity holders can be controlled accordingly. For instance, if firms disgorge cash raised from equity issuance, then the integral risk drops and as a result managers are more likely to undergo risk.

Jensen's (1986) developed the free cash flow hypothesis that can be seen as "a minor variant of the agency argument" discussed in the previous section. (Frankfurter, Wood, 2003, P101) Under this theory, managers may find it easier to pursue their self-goals when the firm has surplus cash after financing all projects with positive net present value. The possible selfish activities range from spree spending to thoughtless expansion (e.g. invest in negative NPV project). Dividend payments are beneficial to sort out the activity of adverse selection by cutting down the free cash flows that are available for managers. In this sense, dividend payouts act as a statutory discipline upon managers. Grossman and Hart (1980), Easterbrook (1984) and Stulz (1990) put similar arguments based on freed cash flow hypothesis forward. Free cash flow hypothesis contradicts MM's irrelevancy proposition, suggesting that corporate dividend policy and investment policy are interacted.

Free cash flow hypothesis implies that the cash-abundant companies without many growth opportunities are more likely to confront overinvestment problem. Lang and Litzenberger (1989) and Grullon, Michaely and Swaminathan (2002) provide the favorable evidence that firms that increase dividend experience decreasing investment, consistent with free cash flow hypothesis. They find that capital expenditures substantially decline in the years after large dividend increases suggesting that firms that increase dividends reached maturity as they experience decline in investment opportunity. However, Howe, He and Kao (1992) provide evidence that price responses surrounding tender offer, share repurchase and special dividend announcements are not statistically different for both high-Q and low-Q firms. Denis, Denis and Sarin (1994) built up a large sample which includes 6777 events of large dividend change from 1962 to 1988. When controlling for the magnitude of dividend change and dividend yield, Tobin's Q has no significant effect on the abnormal returns of announcement period. In addition, for the firms with Tobin's Q less than unit, capital expenditures increase after dividend increase but decrease after dividend decreases. Similarly Yoon and Starks (1995) built up a large sample consists of 4179 large dividend changes over the period of 1969–1988. Slightly different from Denis, Denis and Sarin (1994), Yoon and Starks (1995) add firm size as explanatory variable into their regression model. The results show that the price reactions to announcements of dividend increase are statistically indifferent between firms with Q<1 and firms with Q>1. Yoon and Starks also argue that the investment information is not revealed at the time of dividend announcements as the capital expenditure changes forwards the same direction of dividend changes over the 3 years after dividend announcements. However, they show that low Q firms have higher dividend levels than high Q firms, consistent with the excess fund hypothesis.

Lie (2000) applied cross-sectional regressions to examine the effect of the investment opportunities on the announcement period returns for all disbursements including special dividends, regular dividend increases (greater than 10%) and self-tender offers. For self-tender offers and large special dividends, the coefficients of the interaction variable between cash levels and indicator of low growth opportunity are significantly positive. This indicates at least partial cause of cash payouts may be attributable to overinvestment problem. However, there is no evidence that agency costs of free cash flows are able to explain the fund distributions in the form of regular dividend increases and small special dividends. Thus, under the logic of Lang and Litzenberger's (1989), free cash flow hypothesis can be at best partially approved. In particular, regular dividend increases and small special dividends appear to have no correlation with agent conflicts. Consistent with residual theory, the firms that announced incremental cash distribution generally have sufficient funds. One more contributable finding is that temporary funds support both special dividends and tender offers but permanent funds support regular dividend increases.

The above empirical tests that apply Tobin's Q as a measure of investment opportunities do not support Lang and Litzenberger's (1989) conclusion. Yoon and Starks (1995) discuss the question as to whether Tobin's Q is a good proxy of overinvestment. The choice of cut-off points of Tobin's Q, which discriminate high-Q and Low-Q firms, can be subjective, but this can be alleviated by examining directly the changes in capital expenditures.[21]

2.5.2 Shareholder-creditor Conflict

The management's choice of dividend decisions will be influenced by both the management-shareholder conflict and the shareholder-creditor conflict. If a firm's surplus fund is distributed to its shareholders in the form of dividends, then possible

[21] This method is originally applied by Lindenberg and Ross (1981). Lang and Litzenberger define a value-maximizing firm as one with a one-year q greater than unity, while Lang, Stulz, and Walkling (1991) define a high-q firm as one with a three year average q greater than one.

profitable projects may be missed out and the debt providers bear the increasing bankrupt risk. Jensen and Meckling (1976) suggest that creditors can arrange bond covenants to discipline managerial behaviors that would reduce the value of bonds. For example, Kalay (1982b) find that firms held significantly more cash or cash equivalents than the minimum they are allowed to hold. A debt covenant will prefer high-level cash retention. Myers (1977) also argues that it is common for a bond covenant to regulate debt-financed dividends. These two studies refer to the concept of wealth expropriation, which means that dividend payment serves as a device to transfer wealth from debt holders to shareholders. If the presence of wealth expropriation effects, an increase in dividends will lead to an increase in equity prices but a decreases in bond prices. These predictions under the wealth expropriation hypothesis contradict the expectations under the dividend signaling and agency theories under which both share and bond prices will increase when firms announce an increase in their dividends.

However, this wealth expropriation hypothesis is debatable considering that firms are not likely to weaken their prestige in return for a limited benefit acquired by transferring debt holders' wealth to shareholders. In addition, previous studies argue that the existence of various debt covenants effectively prevents managers from issuing debts to finance dividends or to give up investments in positive NPV projects. Previous studies also provide weak evidence on the wealth expropriation hypothesis. For example, Handjinicolaou and Kalay (1984) find that bond prices fall after the dividend decrease and do not change after those dividend increases. Thus, according to prior analysis, this finding challenges the wealth expropriation. Allen and Michaely (2003) label the finding of DeAngelo and DeAngelo (1990), that firms in financial distress are reluctant to cut dividends, as the sole favorable evidence for the wealth expropriation hypothesis. They argue that not cutting dividends may constitute a significant wealth transfer from debt holders to equity holders. However, this assertion is still questionable since DeAngelo and DeAngelo (1990) report that more than half of their firms are forced to cut dividend by loan covenants. Therefore, the issue is still an open question.

2.5.3 Corporate Governance and Agency Cost

Shareholder rights and legal environment as well as miscellaneous corporate governance mechanisms involving managerial and block-holder ownership, compensation, and board structure may influence a firm's dividend policy either externally or internally. One manifestation is that the firms with high level of free cash flow and lower managerial governance will have the tendency to incur overinvestment (Jensen and Meckling, 1976 and Richardson 2006).

LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (2000) conducted an empirical cross-sectional investigation involving more than 4000 firms across 33 countries. They document that firms in common law countries where minority investors have higher production are more desirable to disgorge cash dividends, in comparison to those in civil law countries. An additional finding is that firms in countries with superior legislation protection empirically commit lower dividend payouts if they are in high growth rate. The combination of these findings indicates that investors take advantage of better law protection to force the management to return surplus funds and to isolate from agency problem they impose. For example, if corporate executives want to expropriate individual investors' wealth and refuse to increase dividends, shareholders have the right to deny this decision or immediately use voting power to change the management. The results refute the alternative hypothesis in which the managers intentionally make dividend payouts in order to establish the reputation in capital markets, which will be beneficial for raising future capital or maintaining high stock prices. LLSV (2000) demonstrate, at country-level, the well-managed firms are more likely to pay higher dividends relative to firms whose outside investors are not protected. Highly efficient legal system ought to be helpful for investors to tackle the agency problem by forcing managers to pay dividends.

Similarly, Mitton (2004) use a sample that consists of 365 firms from 19 emerging markets, to examine how dividend policy links with corporate governance both at country-level and at firm level. The indicator for country-level protection is the type of legal systems. Consistent with the conclusion of LaPorta et al. (2000), the results of Mitton (2004) show that firms in common law countries pay high dividend. In addition, firms with better firm-specific corporate governance pay higher dividends. Eije and Megginson (2008) and Denis and Osobov (2008) provide also additional evidence consistent with "outcome hypothesis".

Gompers et al. (2003) find firms with stronger corporate governance are associated with a range of mature characteristics such as larger firm size, higher profitability and lower capital expenditures. In line with Fama and French (2001), the mature firms tend to pay higher dividends. Combining Gompers et al. (2003) and Fama and French (2001), there should be a positive relation between corporate governance and level of dividend.

Faccio, Lang, and Young (2001) explore the issue of expropriation of minority investors by controlling shareholders from the perspective of dividend policy, using a sample of 3,294 Western European firms and 2,603 Eastern Asian firms. They argue that miscellaneous factors may have an impact on controlling shareholders' expropriation. Faccio et al (2001) use the ratio of controlling shareholder's ownership to control rights (O/C) to measure the possibility of insider expropriation. The lower value of O/C means that the controlling shareholders have greater chance to benefit themselves at the expense of outside investors' benefits. Dividends can be used to address this problem. If controlling shareholders are motivated by the low O/C to invest in suboptimal projects in order to expropriate minority shareholders' wealth, low dividends are expected to be paid because more resources will be under the control of insiders. Their results imply that investors will require higher dividends to remove the resources which may be wasted only if they essentially worry about the expropriation.

Jiraporn and Ning (2006) present results that support the "substitute hypothesis",in which dividend payout serves as a substitution of shareholder rights, i.e., the inclination to pay higher dividends is greater when shareholder protection is weak, intending to build up the reputation of management. They argue that the divergence between their results and the finding of LaPorta et al. (2000) is due to the fact that their test on dividend policy is limited to solo legal system rather than multiple legal systems. This sample sources from Investor Responsibility Research Center (IRRC) for 1993, 1995, 1998, 2000, and 2002 when the data on corporate governance is available. Jiraporn and Ning follow Gompers, Ishii, and Metrick (2003) and use "Governance Index (GINDEX)" as proxy of the level of shareholder protection. The higher GINDEX means that shareholder rights are predicted more heavily by regulation.

Harford, Mansi, and Maxwell (2008) provide US experience that firm value is negatively influenced by weaker governance structures, especially when firms held high excess cash holdings. Weaker governance is meant to lower stockholder rights with which the firm may suffer agency costs largely. This finding is in line with Jensen's (1986) hypothesis that managers could squander surplus funds when free cash flow is ample and consequently firm value is destroyed. Harford, et al. (2008) further discuss that in environments with good shareholder protection like the US, weakly controlled managers do not want to draw the attention of shareholders to their inferior governance due to high cash balances. The managers may also recognize that in some instances others could use the large cash hoard to self-finance corporate control actions against them. This inference leads to a prediction of negative association between corporate governance and dividends.

2.5.4 Managerial Ownership and Agency cost

Jensen and Meckling (1976) argue that the increasing managerial ownership contributes to solve the cost of “separation of ownership and control”. When managers own limited shareholdings and the remaining shareholders do not have sufficient voting power, managerial entrenchment may occur in various forms. The greater fraction of shares owned by management means that the non value-maximum practices are disadvantageous to managers. Thus, managerial ownership aligns the interest of managers and that of outside investors. Barclay, Smith and Watts (1995) also hold the viewpoint that corporate insider ownership reduces significantly the severity of overinvestment problems. As presented in section 2.4.1, Rozeff (1982), Eastbrook (1984) and Jensen (1986) suggest that corporate dividend policy plays a role in overcoming the agency costs of firms. The following question is how the two corporate governance mechanisms are related. The current theoretical models and empirical evidence are mixed.

Using insider ownership as an indicator of the agency costs, Rozeff (1982) build up a multi-factor model in which growth rates, systematic risk level, the population of shareholders are jointly explanatory variables and hypothesize that dividend payout and managerial ownership are substitutes Under Rozeff’s framework, Chen and Steiner (1999) include voting rights, risk taking, and capital structure as explanatory variables. They find that management ownership and dividends are substitute mechanisms aimed at reducing agency costs. In addition, some later studies (Crutchley and Hansen, 1989; Agrawal and Jayaraman, 1994; Mahadwartha, 2007) suggest that dividend payout and managerial ownership are substitutes if the main purpose of paying dividends is to deal with the agency issue. These arguments suggest that managerial ownership should exhibit a negative relation to dividend policy because these two mechanisms are substitutes not complementary. Consistent with these findings, Moh’d et al. (1995) document that larger managerial ownership leads to lower dividend payout ratios. Similarly, Collins, Saxena and Wansley (1996), Dempsey and Laber (1992), Crutchley and Hansen (1989), and Eckbo and Verma (1994) provide further support for Rozeff's (1982) assertion.

Nevertheless, the evidence that is not consistent the substitute assumption (Rozeff, 1982) can be found in other theoretical models and empirical investigations. Demsetz and Lehn (1985) and Fama and Jensen (1983) point out that the external monitoring forces will have very low effect on insiders when managers control corporate stockholdings to some substantial extent Thus, it is possible that dividend policy may convert to have a positive relation with managerial ownership should inside managers hold overwhelming stakes because in such circumstance dividends might be employed as a external discipline for purpose of adding firm value.Likewise, Fenn and Liang (2001) argue that the higher proportion of shares retained by managers will encourage more dividends to be distributed. Fenn and Liang imply that managers would refuse high dividends which determine their control over the company when managerial ownership is low. Grinstein and Michaely (2005) manifest that the enhanced monitoring will lead to higher dividend payouts according to Jesen's (1986) free cash flow hypothesis. As such, the assumption on the contrary to Rozeff (1982) is that there is a complementary relationship between directors' stock ownership and dividends payout in respect of reducing agency costs.

Morck, Shleifer, and Vishny (1988) propose an interesting argument that the relation between managerial ownership and firm performance is not linear. In other words, the increasing proportion of managerial shareholdings will not be bound to stimulate managers to maximize firm value for shareholders. They find that at medium levels (between 5% and 25%), insider ownership increases drive the managers' interests to the opposite direction of stockholders' interests. Following the idea of Morck, Shleifer, and Vishny (1988), Schooley and Barney (1994) suggest a non-monotonic relationship between the dividend payout ratio and managerial ownership. Replicating the original Rozeff (1982) model, Casey and Dickens (2000) investigate the relationship between dividends and managerial ownership using a sample of US firms covering 1982–1992. They find that insider ownership is not significant in explaining dividend levels. Hu and Kumar (2004) also find that managerial ownership does not have significant effect on dividend payout ratios once the factor of firm size is added into the model. Renneboog and Trojanowski (2011) find that given executive directors' personal wealth is associated with shareholdings, dividend payout is needed to diversify personal portfolio and meet individual consumption.

2.5.5 Institutional Shareholders Ownership and Agency Cost

The traditional dividend models predict that large shareholders ownership has positive relation with corporate dividend payments. One argument is that large investors (e.g. pension funds) normally prefer dividend income to capital gains due to their favorable tax rate on dividends. That is, low-taxed or tax exempted institutional investors are expected to select dividend paying stocks, while high-taxed individuals will avoid them. Allen, Bernardo and Welch (2000) assume that firms pay dividends in order to attract large and well-informed investors (e.g. institutions) who are taxed at lower rate and are assumed to have greater ability to discipline the managerial activities. Therefore, higher percentage of institutional participation means better management monitoring, and therefore reduces agency costs and increases firm value. The other argument is that powerful blockholders such as insurance company may compel management to take progressive dividend policies aiming to improve monitoring (Shleifer and Vishny, 1986; Zeckhauser and Pound, 1990). Dividend policy is an indirect approach of monitoring, is less costly, and more effective in certain environment. Moreover, for US market, the other plausible motivation for institutions to own shares with dividend payment is the “prudent man” regulations (e.g., ERISA adopted in 1974), as argued by Brav and Heaton (1998).

The alternate governance mechanism is that block holders, who have strong voting positions or board representations, possess the advantage to monitor the managers’ activity compared to small shareholders. Therefore, the existence of outside block holders constitutes a substitute for dividends as a device to reduce the agency costs. Consistent with this hypothesis, Warther (1993) proposes a “sleeping dogs” theory in which managers set appropriate dividend level to pacify outside disperses investors with the aim to avoid external interference towards business operations. Zwiebel (1996) and Myers (2000) echo the “sleeping dogs” model. This scenario will disappear if shareholders are large enough to exert strong monitoring power on firms’ operations. Under this line of reasoning, there will be a negative relationship between the need to pay dividends and the proportion of outside block holders.

Overall, the empirical evidence provided to date on the impact of large shareholders ownership on dividend policy is mixed. Eckbo and Verma (1994) report a significant positive impact of both relative ownership and voting power of institutional shareholders and managers on dividend policy. Moh’d et al. (1995) show that higher dividend payout is linked with larger institutional ownership, in line with Shleifer and Vishny (1986) that dividends compensate the monitoring activities of the large shareholders. Dhaliwal et al. (1999), on the other hand, report that dividend initiators experience an average 5.7% increase in institutional share ownership, versus a 1.5% increase for matched firms that do not initiate dividends. Binay (2001) also reports dividend initiations (omissions) cause significant increase (decline) in institutional ownership. However, using UK based panel data consists of 211 firms through 1988 to 1992, Short, Zhang, and Keasey (2002) report a significant positive relation between dividend policy and institutional ownership. They suggest that the preferential tax treatment given to institutional shareholders in the United Kingdom. Hotchkiss and Lawrence (2007) show that institutional investors increase the percentage of shares as dividend increases owing to tax clientele. In contrast, Hu and Kumar (2004) find that the likelihood of dividend payments and dividend yields have negative relation with the fraction of total shares owned by the largest outside shareholders. Goergen et al. (2005) find, amongst German firms, a negative relationship between the control power and the need of using dividend policy as monitoring measure. Renneboog and Trojanowski (2008) analyze a large panel of U.K. firms for the 1990s and present results in line with Rozeff (1982) who argues that the impact of the voting power of shareholder coalitions on the payout ratio is consistently negative. Khan (2006) uses panel data consisting of 330 listed UK firms over 1985-1997 to show that ownership concentration has a negative impact on dividends and certain institutions like insurance companies rather than individuals prefer dividends, suggesting that dividends can substitute for the monitoring of concentrated ownership and investors who have large voting power may force firms to pay dividends. Jain (2007) also provides evidence that institutional investors have greater likelihood to own non-dividend paying stocks or low dividend paying stocks while non-institutional investors prefer to hold dividend-paying stocks or high dividend paying stocks. However, using on US data, Zeckhauser and Pound (1990) show that dividend payouts are not a substitute of ownership as monitoring device, since there is no significant difference in dividend levels between firms with and without block shareholders. In addition, a number of empirical studies (Richardson et al. 1986; Michaely, Thaler, and Womack 1995; Brav and Heaton 1998; Grinstein and Michaely, 2005 and Hoberg and Prabhala, 2008) offer evidence that dividend policy does not have a pressing role in explaining changes in ownership[22]. Brav et al. (2005) provide survey evidence that supports practitioners' wisdom that individual stockholders prefer dividends to capital gains and, more importantly, that supports the view that the demands of particular clienteles do not have a major influence on corporate payout policies.

2.5.6 Stock Options and Agency Cost

Stock option plan as a performance-based incentive encourages managers to work in the interest of shareholders. It grants the executives a right to buy some stock shares at a fixed exercise/ strike price for a specified term. While the literature (Mehran, 1992; Carpenter and Sanders, 2002; Yermack, 1996) focuses on the bearing between stock options and firm value，the studies connecting executive stock options to a firm’s dividend policy are limited. On condition that managers are granted stock options, then the interests of managers and individual stockholders are bonded. As a result, agency costs will be minimised. In addition, in order to boost stock prices, managers will prefer to invest in positive NPV projects rather than pay dividends to shareholders.

Lambert, Lanen, and Larker (1989) find that dividends decline relative to expected levels after the adoption of executive option plans. Similarly, studies by Hu and Kumar (2004) and Bhattacharyya et al. (2008) report a negative relation between stock options and dividend payments. Consistent with Lambert, Lanen and Larcker (1989), Weisbenner (2000), and Allen and Michaely (2003) argue that the growing popularity of executive stock options may create an incentive to pay fewer dividends in that executive stock options are not “dividend protected”. Instead, corporate decision makers tend to distribute more cash in the form of repurchases and to avoid stock dilution resulting from the exercise of stock options. Similar to Lambert et al. (1989), Fenn and Liang (2001) empirically examine this relationship by large sample covering 1993–1997 and report a strong negative relationship between dividends and management stock options. Further, Fenn and Liang find a statistically significant, positive relationship between repurchases and management stock options. The results

[22]Richardson et al. (1986) only find minor trading volume changes after dividend initiations. Michaely et al. (1995) observe “relatively minor” trading volume changes following both initiations and omissions, and dividend omissions are associated with a small average increase (from 30.0% to 30.9%) in institutional ownership, whereas a sharp decline should have occurred if dividends were essential to make the stock attractive to these investors. Brav and Heaton (1998) fail to find statistically significant decline in quantity of institutional investors after dividend omissions. Grinstein and Michaely (2005) find that while institutions tend to avoid holding stock in firms that pay no dividends, firms that increase dividends do not attract greater institutional ownership. Hoberg and Prabhala (2008) find that institutional ownership does not significantly change after dividend increases.

explain why managers with substantial levels of stock options prefer to make stock repurchases at the expense of cash dividends.

2.5.7 Summary

Corporate dividends reduce agency costs due to either increasing the external monitoring or lessening extra cash flows available to managers that could be wasted for private interests (Jensen and Meckling, 1976; Rozeff, 1982; Easterbrook, 1984; Jensen, 1986). Dividend payments force firms to raise funds externally to finance new investments, which in turn increase the level of external monitoring of corporate activities. By returning free cash flows to shareholders, dividend payments reduce the opportunity of managers to make sub-optimal investments.

Agency rationale sheds light on the link between dividend policy and corporate governance. Jensen and Meckling (1976) and Richardson (2006) argue that firms with high level of free cash flow and lower managerial governance will have the tendency to overinvest. In respect of the relation between between dividend policy and corporate governance, LaPorta et al. (2000) propose the “outcome model” suggesting that better protected investors can require corporate insiders to pay dividends in order to reduce agency costs. LaPorta et al. (2000) also propose the “substitute model” suggesting that the companies with substantial moral hazard intentionally pay dividends to investors who are not well protected by law in order to establish a reputation for future external financing.

It is controversial in literature about whether dividends and corporate governance are substitutes or complements. Rozeff (1982) argues that dividend payout and directors’ ownership can be viewed as substitutes for mitigating agency conflicts and predicts that firms pay higher dividends when insiders hold a lower fraction of equity. This logic is similar to the “substitute model” proposed by LaPorta et al. (2000). Jensen’s (1986) substitution notion suggests that debt and dividends can be substitutes for reducing agency costs. Some recent studies (e.g. Jiraporn and Ning, 2006; Officer, 2006) are consistent with the notion that dividend payments and corporate governance can be substitutes.

In contrast, Fenn and Liang (2001) argue that owner-managers as stock investors will benefit from dividend disbursement which might act as a performance-enhancing incentive. Thus, the argument of Fenn and Liang (2001) is similar to “outcome model” of LaPorta et al. (2000) which implies that strong corporate governance leads to higher demand of dividend payouts. For the other example, Zeckhauser and Pound (1990) argue that institutional investors with strong voting power may oblige companies to increases dividends to move away free cash flow from managers.

2.6 Life Cycle Hypothesis

2.6.1 Theoretical Model

Firms have their own life cycle. Premised on Knight (1921) and Schumpeter (1934), Mueller (1972) proposed a formal life cycle theory. The start-up stage can be difficult for a fresh firm because of the existing market threshold. The limited initial resources must be invested into product development, marketing and organization. After the start-up stage, the firm will reach a high-growth stage during which it expands customers and exploits the market potential. Firms will eventually reach a point at which they progress from a high growth period to a so called ‘maturity period’. With increasing market competition, profitable investment opportunities become absent and the growth rate declines.

These characteristics associated with a firm normally vary over its life cycle and dividend polices at different points in time are adjusted by managers correspondingly. In an early period, a newly listed firm, recently entered into the stock market has plenty of growth opportunities but at same time, its profitability is relatively low and volatile. Meanwhile, the cost of capital of young firms is relatively higher due to the severer information asymmetry. Thus, the best financial strategy for a newly established company is to retain earnings rather than to distribute them immediately. When the firm matures, its investment opportunity set begins to shrink due to the more competitive market environment. Simultaneously, the growth rate of assets slows down and the systematic risk set has dropped, but the earning capacity increases. As a result, the quantity of accumulated cash flow exceeds the capital demand. It is unsurprising that a firm in a mature stage has the capability to return surplus cash in the form of dividend payments to shareholders.

Jensen’s (1986) agency theory of free cash flow provides a reasonable explanation for the dynamics suggested by the lifecycle proposition. In the early stage, the agency costs are not substantial since it is assumed that managers are less likely to pursue their own interests at the expense of profitable investments. When the corporation reaches the maturity stage, the accumulated surplus capital causes an increase in agency costs, which can consequently reduce firm value. To mitigate the agency costs, mature firms reach a position to initiate or increase dividends so that stock price will be protected. In other words, a young firm can be more efficient in utilizing capital than an established firm, as the need to pay dividends is weak and vice versa.

Previous studies relating to the life-cycle theory of dividends (Fama and French, 2001; Grullon, Michaely and Swaminathan, 2002; DeAngelo and DeAngelo, 2006) suggest that corporate decision makers design dividend policy by taking into account the trade-off between the benefit, (e.g., reduction in agency costs of free cash flow) and cost of cash flow distribution (e.g., floating cost due to dividends). In addition, a firm is subject to different levels of capital cost at different points in its life cycle. A young firm has a relatively high cost of external capital for to two reasons. First, investors have less information about a newly listed firm, so information asymmetry tends to be material. Second, a young firm is in great need of cash infusion and its internal funds are limited. As the firm becomes more mature, the information asymmetry is less severe and the cost of external capital drops. These arguments suggest that a firm in its maturity stage faces increasing agency cost as well as lower cost of external capital, and therefore, paying dividends is preferential.

The prediction of the signaling theory of dividend policy is seemingly opposite to that of investment opportunities and supply of cash flow. A young firm should have stronger motivation to address the issue of information asymmetry because of its limited communication with the market participants. In contrast, a mature firm should have already set up efficient channels to communicate with outside investors. Thus, if dividend payment is a tool to convey information from insiders to outside investors, newly listed firms have a greater need to pay dividends than mature firms do.

The predictions of the dividend residual theory are in line with the implications of the lifecycle hypothesis. Both theories emphasize that rational management will meet the requirement of investment in the first place and only distribute the remaining cash after investments are undertaken. As DeAngelo and DeAngelo (2006) pointed out that satisfying the positive NPV projects is the fundamental principle of MM’s (1961) irrelevancy proposition. The most obvious discrepancy between the life cycle theory and dividend residual theory is that the former explains the time profile of dividend policies by dynamic means. The residual cash flows after undertaking available investments vary at different time along life cycle of firms due to the time-changing growth opportunities. In other words, the residual theory leads to opportunities-induced and time-varying dividend strategy.

2.6.2 Empirical Evidence

The important empirical evidence presented by Grullon, Michaely, and Swaminathan (2002) suggests that the systematic risk firmly declines (increase) during the post period of dividend increase (decrease). This finding features an alternate discrepancy between mature firms and high-growth firms. The appreciation of stock prices after the dividend increase further indicates that the market categorizes firms that increase dividends as ones with relatively lower systematic risk. Besides, this study provides support to Lintner's (1956) argument of dividend smoothing which suggests that firms are unlikely to set high target payout ratios until the earning level can persist. Fama and French (2001) conduct an analysis of dividend policies across all US listed firms. They suggest that the decrease in the proportion of dividend payers is partly the result of the increasing number of firms with small size, low profitability and high growth. This suggests that firms at their initial stage are reluctant to undertake progressive dividend decisions. Although they argue that the propensity to pay dividends still goes down even if they control for these characteristics of firms, their study provides some support for the life cycle hypothesis. DeAngelo, DeAngelo and Stulz (2006) employ a mix of earned/contributed capital as a logical proxy for the extent to which a firm matures, and provide additional evidence for the life cycle theory of dividend policy. In their test, the ratio of retained earnings to total equity (RE), and the ratio of retained earnings to total assets (TA) are measures of the maturity of firms.

When firms are in a stage of absorbing external capital, values of RE/TE (RE/TA) tend to be low. When firms mature, the values of RE/TE (RE/TA) tend to be high, as internal cash flows are accumulated and self-financing ability is intensified. They find that the propensity of dividend distribution is influenced significantly by the ratio of internal capital to the external capital after controlling for traditional firm characteristics, cash flow and dividend history. More recently, Denis and Osobov (2008) conduct an international empirical investigation involving six economies: United States, United Kingdom, Japan, Canada, Germany and France. They find that the "earned contributed capital mix" explains strongly the inclined propensity of paying dividends. Although the findings of Bulan, Subramanian, and Tanlu (2007) and Eije and Megginson (2008) are compatible with life cycle theory of dividends, there is no evidence that the mix of earned/contributed capital affects dividend decisions.

2.6.3 Summary

Fama and French (2001), Grullon, Michaely and Swaminathan (2002), and DeAngelo and DeAngelo (2006) suggest that corporate decision makers design dividend policy by taking into account the trade-off between the benefit, (e.g., reduction in agency costs of free cash flow) and cost of cash flow distribution (e.g., floating cost due to dividends). In light of life cycle theory, changes in dividends reflect the variability of growth opportunity and free cash flows. Firms in the early stages of their life cycles prefer reinvest into profitable projects to distribute dividend payments. Firms are likely to pay dividends when they reach matures stages of life cycles in term of profitability and growth opportunities. Overall, the empirical evidence is consistent with the implications of the firm life cycle theory of dividends.

2.7 Catering Hypothesis

2.7.1 Theoretical Model

Compared with the traditional rationality assumptions, behavioral corporate finance is potentially more realistic, in that it emphasizes that both investor and managerial behaviors are less than fully rational. In practice, corporate payout policy can be influenced by the irrational actions of managers and/or investors (Barberis and Thaler, 2003 and Baker et al., 2007b). As argued by LaPorta et al. (2000), corporate dividend policy may be substantially shaped by investor preferences in common law countries, in which legal systems provide strong investor rights. In civil law countries, where investor protection is weak, managerial motivations are likely to dominate the tendency of paying dividends, while investor preferences at best play an ancillary role in corporate payout decisions.

Shefrin and Statman (1984) originally established a behavioural dividend theory explaining why individual investors prefer dividend-paying stocks to non-dividend-paying stocks. This model assumes that three psychological considerations account for demands for dividends. Firstly, investors may be prone to employ regular cash dividend payment as a “self-control” device for their private consumption. Specifically, the investors follow the rule of “consume only out of dividends” so that they avoid the risk of excessive spending. In line with other dividend theories, such as signaling model, “self-control” hypothesis implies that the benefit resulting from dividends ought to be large enough to offset the relevant costs such as tax burdens caused by dividends. Secondly, adopting the rule of “consume only out of dividends” is beneficial as investors do not regret the decision of selling stocks in case the stock price appreciates later on. This sort of motivation is referred to as “regret aversion”. Thirdly, investors tend to discriminately value diverse sources of income due to “mental accounting”. For example, if an investor considers the marginal utility of a unit dividend to outweigh that of a unit capital gain, she/he will correspondingly give priority to the type of stocks which come with dividends.

Baker and Wurgler (2004a, 2004b) argue that some investors’ preference to dividend-paying stocks may be time varying, and the potential cause can be attributed to institutional clientele or uninformed sentiment. In other words, investors’ demand for dividend-paying stocks features the nature of “fads” or “fashion”. Black and Scholes (1974) state that dividend clientele rise due to taxation, transaction costs, and regulations on institutions. As discussed above, the psychological factors such as “mental accounting” (Shefrin and Statman, 1984) constitute the basis of sentiment. Such demand for dividend payers changes over time and materially affects stock prices, bringing about an increase or decrease in stock price. This contradicts the assertion by Miller and Modigiliani (1961) that in a perfect market environment, arbitrage prevents investors from having a preference between capital gains and dividends. To benefit stock prices, corporations actively cater to the demand of investors by adjusting dividend policies. For example, in periods when markets put a premium on dividend payers, the non-dividend payers are more likely to start paying dividends.

In contrast, conventional dividend hypotheses assume that insider executives tentatively apply dividend payment as a certain tool to address some difficulties the corporations are confronting. For example, when investors do not have enough information on interior cash flows or prospectuses, dividend payments show managers’ confidence regarding the long-term capability to raise earnings in spite of the existence of the relevant costs that may occur. When insiders are wondering if managers act as perfect agents, dividend disbursements reduce resources, which could potentially be squandered. Both Shefrin and Statman (1984) and Baker and Wurgler (2004a, b) show that investors are perhaps motivated by irrational views to make decisions between dividends and capital gains. However, unlike Baker and Wurgler (2004a, b), Shefrin and Statman's (1984) theory does not necessarily require that investors' irrational preferences change over time.

2.7.2 Empirical Evidence

(1) Positive Evidence

Baker and Wurgler (2004a) report that variations of both the value weighted dividend premium and equally weighted dividend premium reflect the variation of the propensity to pay dividends. During the period from 1962 to 2000, US corporations had stronger incentives to pay dividends as there was a price premium credited to dividend-paying firms. The values of dividend premium were positive during two periods: 1962-1966 and 1970-1977, and negative for the remaining observed years. In general, their study strongly supports the prediction that dividend premium can explain the corporate decisions of dividend initiation and omission. Baker and Wurgler (2004b) provide additional evidence that catering incentives have strong explanatory power for the propensity to pay dividends over the period between 1963 and 2000, which is described by Fama and French (2001).

Li and Lie (2006) developed the catering theory by using the price premium of dividend payers to explain dividend increase and decrease. They found that dividend premium explains dividend initiations, omissions, and the magnitude of dividend changes. The market responds positively to changes in dividends, which are motivated by managerial catering. Bulan, Subramanian, Tanluet (2007) applied dividend premium as an explanatory factor in their dividend life cycle model. They find that the likelihood of paying dividends is higher if the market puts a higher price premium on firms that pay dividends, even after controlling for maturity characteristics such as size, growth rate, cash flows and capital expenditures. They find that dividend initiation signal that a firm becomes mature and that managers cater for the dividend demand of its investors. Kale, Kini and Payne (2012) examine the determinants of dividend initiations of IPOs. They test the major dividend theories including residual, tax, transaction costs, clientele, agency, signaling and catering. Catering proxy is used as one explanatory variable in the regressions exploring the determinants of dividend initiation decisions (Logistic regression), the level of dividends initiation (Tobit regression) and the timing of dividend initiation (Cox Hazard Model). All regressions show a positive relationship between dividend premium and the decision to initiate dividends. However, they also find evidence supporting the various other dividend theories. Ferris, Sen, and Yui (2006b) find a similar decreasing trend in UK dividend policy documented by Fama and French (2001), controlling for characteristics of size and profitability. They conclude that catering factor has a significantly positive impact on UK firms' propensity to pay dividends. The tax law indicator, mirroring the tax law change of June 1997, has no explanatory power for dividends trends in the UK.

Neves (2006) studied the relevancy to dividend catering theory among Eurozone countries. She finds that firms in Eurozone countries are concerned with market sentiment when they make dividend policy, and that the catering effect interacts with firm characteristics including liquid assets, investment opportunities and free cash flow. More recently, Ferris, Jayaraman and Sabherwal (2009) examine firms in 23 countries. They show that, consistent with the "outcome hypothesis" of LaPorta et al., (2000), shareholders in common law countries push managers to cater to the market sentiment about dividends, but firms in civil law countries are not driven by catering incentives to make dividend decisions.

(2) Negative Evidence

Julio and Ikenberry (2004) found that while there is an increase tendency in dividend premium from 2000, in line with the observed phenomenon of "reappearing dividends", the variation of dividend premium for other periods does not correspond to the change of the propensity to pay dividends. In addition, they found that abnormal returns for initiation announcement periods do not change over time after 1997, when they control for the size and age of initiating firms. These findings suggest that it is difficult to relate the tendency of initiating dividends to manager's intention of catering to investors. Based on firms listed on the London Stock Exchange during the 1990s, Renneboog and Trojanowski (2008) report a contradiction of catering hypothesis that while the average Tobin's Q of non-dividend payers in the large part of sample periods is higher than that of dividend payers, there are still a great number of corporations which persist with dividend payments.

Hoberg and Prabhala (2005, 2006) test whether changes in the propensity to pay dividends is a function of growth opportunity, profitability, firm size, catering incentives and idiosyncratic risk. They find that the coefficients of dividend premium (Baker and Wurgler (2004a, b) are positive and significant without risk variable in the model, but become insignificant after controlling for risk; the adjust R^2 for the regression appears to be extremely small (-0.018 for the period 1963 to 2000). Their results cast only some doubt on the catering hypothesis of dividend policy rather than robustly negate the catering incentive in making dividend decisions. Using German data, Savov and Weber (2006) fail to find any supporting evidence for the catering theory, even after controlling for the current growth rate.

Eije and Megginson (2008) examine the determinants of dividend policy among European Union firms by building up logistic regressions, setting the dependent variable as 1 if a firm pays dividends and 0 otherwise. The model includes country-specific dummy variable equals 1 if the median market to book ratio of dividend-paying firms is larger than that of non-dividend-paying firms, to test if firms cater to the dividend demand of investors. According to the original catering model (Baker and Wurgler, 2004a), a significant positive relation should exist between catering proxy and the direction of dividend payout. Their results are not consistent with catering theory as the catering dummy had significantly negative slopes for the full period of 1991-2005 and a sub-period of 2001-2005, and has no explanatory power for the other sub-periods. Denis and Osobov (2008) present two key results contradicting the prediction of the catering theory. First, in some countries like the UK and Japan, while the dividend premium changed materially the propensity of paying dividends remained stable in the mean time. Second, the dividend premium does not move in the direction of dividend shift (initiation and omission), in terms of frequency and direction. Denis and Osobov conclude that the catering incentive is not the first-order cause for the observed dividend patterns, as it does not correspond with the difference between the expected and the actual percent of dividend payers. Instead, the dividend patterns seem to depend on the relevant life cycle characteristics. In particular, the correlation between the dividend premium and the shift in the propensity to pay dividends can hardly be proved in the United Kingdom, Canada, France, Germany, and Japan. Chay and Suh (2008) report empirical results similar to Eije and Megginson (2008) as their dividend premium appears to have a wrong sign (negative) in regressions for explaining dividend policy.

Studies based on stock price reaction to dividend initiation announcements also do not support the catering theory, suggesting that the long-term stock returns will run into the opposite direction of dividend changes. For example, stocks of dividend paying firms are over-valued when investors irrationally put price premium on dividend-paying stocks. When the market reveals the true value for firms that change dividend policy to cater to investors, the overvalued stock prices fall. However, this prediction is not compatible with Michaely et al. (1995) who report long-run price increases during the post period of initiation announcements. Benartzi, Michaely, and Thaler (1997) and Grullon, Michaely, and Swaminathan (2002) provide evidence that long-run price increases during the post period of dividend increase announcements.

2.7.3 Summary

Baker and Wurgler (2004a, 2004b) argue that some investors prefer dividend-paying stocks due to time-varying sentiment. Managers cater to such sentiment by paying dividends when the market put price premium on firms that pay dividends. The existing literature does not provide conclusive evidence for the dividend catering theory. In general, the catering hypothesis of dividend policy confronts several challenges. First, future research should discuss more about whether dividend premium is a reliable proxy of market sentiment. An alternative explanation of dividend premium is the difference in investment opportunities between dividend payers and non-payers. The likelihood of paying dividends should be adversely connected with investment opportunities. For the former payers, the rate of continuing to pay dividends will decrease with the increase in dividend premium since payers generally have greater investment opportunities than non-payers. To further explore this issue, future tests need to investigate the correlation between dividend premium and market-to-book ratio, as the latter is commonly known as investment opportunity. Second, it is difficult to assess whether managers actively cater to market sentiment or are compelled by extreme investor demand. Third, individual firm characteristics should be integrated with investors' sentiment to explain dividend policy. Julio and Ikenberry (2004) document that catering holds no explanation after adjustment of size and age. Fourth, catering theory predicts that corporations tend to alter the supply of dividends in response to the time-varying investors' sentiment. This prediction is not line with the concept of "dividend smoothing".

2.8 Summary and Remarks

The academic literature is still not clear as to whether, when, why and how companies pay dividends, and whether dividends create or destroy value (see below and Allen and Michaely, 2003; DeAngelo, DeAngelo, Skinner, 2008, for extensive reviews). In general, the extant literature has not reached a consensus on dividend signaling equilibrium (Allen and Michaely, 2003). First, the overall evidence does not provide strong support for the assertion that dividend changes convey information about future earnings. Second, the studies on the market reaction to dividend announcements yield results in accordance with information signaling hypothesis. Third, in most cases, analysts revise their predictions on earnings in the same direction with changes in dividends. Finally, empirical results obtained from field surveys are relatively mixed.

Nonetheless, previous studies did not negate the hypothesis that dividends carry inside information about corporations. Miller (1987), Benartzi, Michaely, and Thaler (1997), Garrett and Priestley (2000), Koch and Sun (2004) show that dividend policies reflect the past or current company performance before dividend announcement. However, previous studies focus on seasoned firms and analyze the determinants of and the market reaction to dividend initiations (Asquith and Mullins, 1983; Healy and Palepu, 1988; Christie, 1990). There is absent of evidence showing how pre-IPO financial accounting position influence the dividend policies presented in IPO prospectuses.

The other interesting question may be how two signaling devices are interrelated. For example, Booth and Smith (1986) suggest that venture capital backing and underwriter reputation can serve to provide certification to firms. According to the IPO signaling hypothesis (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989), dividend payments are more likely for issue firms that are venture capital backed or sponsored by prestigious underwriter since “good” firms are able to afford costly dividends. However, it is also possible that two signal devices are substitutes. For instance, dividends might substitute venture capital backing as a signal. Preceding literature does not discuss this issue clearly.

Agency rationale sheds light on the link between dividend policy and corporate governance. LaPorta et al. (2000) propose the “outcome model” suggesting that better protected investors can require corporate insiders to pay dividends in order to reduce agency costs. LaPorta et al. (2000) also propose the “substitute model” suggesting that the companies with substantial moral hazard intentionally pay dividends to investors who are not well protected by law in order to establish a reputation for future external financing. However, the literature about whether dividends and corporate governance are substitutes or complements is controversial. Rozeff (1982) argues that dividend payout and directors’ ownership can be viewed as substitutes for mitigating agency conflicts and predicts that firms pay higher dividends when insiders hold a lower fraction of equity. This logic is similar to the “substitute model” proposed by LaPorta et al. (2000). Similarly, Jensen (1986) argues that dividends and debt are substitutes since both of them help reduce agency costs. More studies such as Jiraporn and Ning (2006) and Officer (2006) have mentioned the substitute assumption.

In contrast, Fenn and Liang (2001) argue that owner-managers as stock investors will benefit from dividend disbursement which might act as a performance-enhancing incentive. Thus, the argument of Fenn and Liang (2001) is similar to “outcome model” of LaPorta et al. (2000) which implies that strong corporate governance leads to higher demand of dividend payouts. Other studies such as Grinstein and Michaely (2005) and Zeckhauser and Pound (1990) contain the concept of complement in developing their arguments. A range of IPO-specific factors might have the potential to act as the proxy variables to test above controversial assumptions. These IPO-specific factors can include managerial ownership, lockup agreement, institutional ownership, venture capital backing, managerial stock option and long-term debt ratio. However, previous literature has not developed relevant hypotheses in the context of IPO.

Although agency cost-based lifecycle theory are broadly supported by empirical evidence (Fama and French, 2001; Denis and Osobov, 2008; Eije and Megginson, 2008), some evidence is mixed and more possible proxy variables deserve to be tested. For example, Eije and Megginson (2008) find that the fraction of retained earnings to total equity is not a significant explanatory variable in explaining dividend policy, inconsistent with the findings of DeAngelo, DeAngelo, and Stulz (2006) and Denis and Osobov (2008). Additionally, since the empirical evidence on catering theory is controversial, more tests are necessary.

Chapter Three

When Do IPOs Start Paying Dividends?

3.1 Introduction

Previous studies identified a number of conflicting hypotheses to explain firms' dividend decisions. On the one hand, the signaling, agency costs and shareholder preferences suggest that companies can create value by paying dividends. On the other hand, the introduction of taxation implies that firms destroy value by paying dividends when dividends are taxed at a higher rate than capital gains (see Allen and Michaely, 2003, for review). In this chapter, I focus on the impact of signaling and agency costs on firms' dividend policy. I chose the case of Initial Public Offerings (IPOs) to test the various hypotheses underlying the dividend decision because such newly listed firms are characterized by high information asymmetries and maybe subject to high agency conflicts. I hand-collect a large number of IPOs specific characteristics, including lockup lengths, underpricing and ownership structure, which I use as proxy variables in my tests, and assess the likelihood that an IPO pays dividends in the first few years of its quotation.

Recent empirical research has studied the dividend behavior of IPO firms. In these studies, a number of characteristics concerning IPO are used to explain the timing of dividend initiation (Bulan, Subramanian and Tanlu, 2006), the choice of payout methods (Jain, Shekhar and Torbey, 2009) and the decision to initiate dividends (Kale, Kini and Payne, 2012). However, the theoretical links between IPOs and post-IPO dividend decisions principally remain ambiguous in the literature[23]. In addition, any evidence that has been offered about the effect of the IPO decision on dividend payout

[23] For example, Kale et al. (2012) use underpricing as an explanatory variable in multivariate regressions of whether IPO decide to initiate dividends, but they neither present a clear line of argument nor discuss the implication of their results.

is often contradictory. For instance, Michaely and Shaw (1994) argue that firms who underprice less tend to pay higher dividends, but this contradicts Allen and Faulhaber's (1989) hypothesis in respect of IPO signaling and Kale et al. (2012) find that underpricing is not a significant factor in explaining why IPOs initiate dividends in their regression settings.

Moreover, previous studies do not consider the effects of some important IPO-specific factors, such as lock-ups[24], insider ownership, institutional ownership, and managerial option plans on the dividend decision in the post-IPO period. Moreover, the current empirical evidence in this area has been dominated by US-based rather than UK-based research, but the US experience is of limited value in the UK because of the different regulations, competition rules and IPO protocols adopted in both countries. For example, while in the US lockup agreements are relatively standard and their average length is around 180 days (Brav and Gompers, 2003), in the UK, companies tend to implement more varied and flexible lockup agreements in comparison to US companies (Espenlaub et al. 2001), and their average length is 365 days (Hoque and Lasfer, 2009). In an attempt to fill the existing gaps in the literature, this paper answers the following fundamental questions about the dividend decisions of IPOs. Has the probability that IPO firms start to pay dividends been shifting over time? When do IPO firms start to pay dividends? What are the influential factors in the decisions of whether IPOs pay dividends and the timing of dividend initiation? Do these determinants have any theoretical implications for the relation between IPO practice and dividend policy? In discussions contained in this chapter, high propensity of initiating dividends has two meanings: the greater chance that IPOs initiate dividends and earlier dividend initiation.

This investigation first seeks to develop a series of hypotheses in which IPO-spcific fators and accouting characteristics are theoretically linked to the post-IPO dividend patterns, namely whether or not IPOs pay dividends and the timing of dividend initiation. The next task is to examine empirically these hypotheses using a large sample that consists of 1707 IPOs issued on the London Stock Exchange in the period between 1990 and 2010. Following Jain et al (2009) and Kale et al. (2012), the tested sample includes any IPO firms that paid dividends during its public life or until the end of 2011. As well as the data collected from DataStream, a considerable amount of data is collected manually from offering prospectuses. To achieve the different research

[24] A typical lockuplockup agreement provides that directors, related parties and any relevant employees undertake to give up the right to sell a specific percentage of their shareholdings for a specified period after they are issued.

objectives, various methods are employed including: univariate analysis, the cross-sectional regression model, the cross-sectional ordinal regression model, the Cox Proportional Hazard (CPH) model, and the unbalanced panel regression model. I also estimate the linear probability model (LPM) regression using the OLS, Newey-West, GLS and Fama-Beth techniques in order to check the validity of results by estimating the unbalanced logistic panel regressions.

The main findings generated from this study are as follows. Firstly, the results show that during the sample period, the percent of dividend-initiating IPOs is 46.8%, but IPOs issued in 2000s are generally more reluctant to initiate dividends than those issued in the 1990s (70.8% vs. 32.6%, respectively). These results suggest that the probability of paying dividends is sample period dependent and that the time effect should be considered in the regressions models. The results also indicate that more than half of dividend-paying companies start to pay dividends within the first year after their IPO.

Secondly, in line with Michaely and Shaw (1994), my results show that underpricing is negatively associated with the probability of dividend initiation and the early dividend initiation. The negative effect of underpricing on dividend initiation cannot be explained by the IPO signaling rationale in Allen and Faulhaber's (1989). This may suggest that paying no dividends or postponing the dividend payment means the information asymmetry is substantial, so the issuing firms would intentionally lower the offer price to compensate the uninformed investors, in line with the implication of Dividend Discount Model and Rock's "winner's curse" (1986).

Thirdly, consistent with the prediction of dividend signaling theory, managerial ownership and underwriter reputation, two signaling proxy variables, are positively associated with the likelihood of initiating dividends considering. However, inconsistent with signaling, VC backing, the alternative signaling proxy variable, is found to be a factor with negative effect on the likelihood to pay dividends, indicating that IPOs substitute dividends as signaling device. Besides, the impact of the institutional ownership on the decision to initiate dividends of IPOs is not significant.

Fourthly, consistent with the substitute assumption of agency costs which suggests that weak corporate governance leads to higher demand of dividend payouts (Rozeff, 1982; Jensen, 1986; Smith and Watts, 1992; Gaver and Gaver, 1993; LaPorta et al., 2000; Officer, 2006), the results show that initiation propensity is negatively influenced by the full lockup restriction period, VC backing and managerial stock option. My test contributes to confirming the negative relation between lockup length and dividends (Brav and Gompers (2003). The negative relation between lockup length and dividends is in line with the finding of Jain et al. (2009) implies that venture capitalists enhance the monitoring for the backed companies (Chan, 1983; Barry et al., 1990; Megginson and Weiss, 1991; Bergloff, 1994; Hellmann, 2002; Lee and Wahal, 2004; Cumming and Johan; 2008; Krishnan et al., 2011) and, as a result, the demand of dividends declines. The negative effect of managerial options (OPTION) is consistent with the findings reported by Smith and Watts, (1992), Yermack (1995), Weisbenner (2000), and Fenn and Liang (2001).

Fifthly, consistent with the complement assumption of agency costs which suggests that dividend payment is a complement for corporate governance (LaPorta et al., 2000; Fenn and Liang, 2001; Grinstein and Michaely, 2005), managerial ownership and leverage are positively related to the inclination of dividend initiation. In addition, consistent with free cash flow hypothesis, IPOs' preference to initiate dividends is adversely influenced by the growth opportunities of IPOs, technology intensity and issuing on AIM.

Moreover, consistent with the suggestion of life cycle theory (Grullon et al., 2002; DeAngelo et al., 2006), VC backing and lock-up agreement have negative effect on the dividend policy of IPOs. According to lifecycle theory, dividend policy is positively affected by the firm's maturity stage. Venture capitalists are assumed to prefer early-stage companies (Lerner, 1994; Gompers, 1995; Bergemann and Hege, 1998; Gompers and Lerner, 2000, 2003; Lee and Wahal, 2004; Cumming and Johan, 2008 and Krishnan et al., 2011). Lock-up agreements tend to be more restrictive for young firms (Brav and Gompers, 2000, 2003). Also, consistent with the predictions of lifecycle theory, IPO firms with larger size, higher profitability and lower growth opportunities are found to be more likely to initiate dividends and pay earlier, In line with previous studies (Fama and French, 2001; Bulan, et al., 2007; Denis and Osobov, 2008; Eije and Megginson, 2008; Ferris et al., 2009 and Kale et al., 2011). The other findings in support of lifecycle theory include the negative effects of technology focus and AIM issuance on initiation propensity. In addition, as Eije and Megginson (2008) argued, the positive effect of leverage is consistent with life cycle hypothesis since mature firms may be associated with high leverage. Finally, the tests show that the IPOs issued in years when markets put a price premium on dividend paying payers are more likely to become dividend payers and tend to initiate dividends earlier, consistent with the implication of catering theory (Baker and Wurgler, 2004a).

Overall, my results suggest that the dividend behaviours of IPOs are influenced by miscellaneous theoretical mechanisms. The most homogeneous results are associated with the life cycle theory and catering theories. There are also some empirical results in support of signaling and agency theory. These results contribute to the existing literature as they show that IPO factors affect significantly the aftermarket dividend decisions.

The rest of the chapter is structured as follows. Section 3.2 draws on previous literature to develop seventeen hypotheses to be tested. Section 3.3 outlines the sample selection and data description. Section 3.4 details the methodology that has been used to test these hypotheses as well as empirical results. Section 3.5 presents robust tests and the final section discusses the findings and conclusions of the testing.

3.2 Literature Background and Hypotheses

In this section, I contrast the various theories of dividends and IPOs to set up my hypotheses relating to the main dividend theories: signaling, agency conflicts, life cycle and catering. In developing these testable hypotheses, I attempt to clarify the theoretical links between IPOs' propensity to initiate dividends and a range of IPO-related factors.

3.2.1 Asymmetric Information and Signaling

Lintner (1956) model suggests that managers tend to set a long-term target payout ratio and that dividends are sticky, tied to long-term sustainable earnings, and smoothed from year to year. Lintner's description of dividend policy actually implies dividend changes contain the information of earnings. Miller and Modigliani (1961) also suggest that dividends convey information on future cash flows in an incomplete market where information asymmetry exists. Bhattacharya (1979), Miller and Rock (1985), and John and Williams (1985) forward formally signaling theory, which suggests that firms intentionally pay dividends to signal the intrinsic value of firms at the expense of issuing new shares (Bhattacharya, 1979), letting slip positive NPV project (Miller and Rock, 1985) or higher taxes on dividends relative to capital gains (John and Williams, 1985). Dividend payout has the potential to be a signal since low quality firms are unable to afford the costs attached with dividends. In the context of signaling, the links between dividend activities of IPOs and a series of proxy variables, such as underpricing, directors' stock ownership, lockup agreements, institutional ownership, and venture capital participation and underwriter reputation, are discussed in the following section.

(1) Underpricing

The first day trading price of IPOs is usually higher than the offer price specified in the offering prospectus.[25] This difference known in the literature as underpricing or first day return is considered in previous literature to signal the quality of the IPO. It is possible for share under-pricing to be linked to dividend policy by looking at the Dividend Discount Model that suggests that the market share price is the present value of the expected future dividend streams. This implies that market share price reflects the information given to investors on the first trading day. On the other hand, the offer price can partly reflect information given to corporate insiders. Hence, underpricing increases with the degree of information asymmetry between outside investors and insiders. This inference coincides with Rock's theory (1986) about the 'winner's curse' which explains how an expected initial return needs to positive in order to retain the participation of uninformed investors who are more likely to receive unattractive offerings, and earn lower initial returns in comparison to informed investors. Ritter (1984), Beatty and Ritter (1986) and Megginson and Weiss (1991) all consistently suggest that there is an underlying positive relationship between underpricing and ex ante uncertainty about the value of the IPO firm. Moreover, Michaely and Shaw (1994) argue that underpricing should become less common as more information is distributed homogeneously across investor groups and that uncertainty about an IPO firm decrease when dividends are eventually distributed. Overall, the degree of underpricing discloses the intensity of information asymmetry.

We may assume that the issue of uncertainty is more serious for those companies that do not pay dividends or that postpone the dividend payment because investors are unable to obtain information from dividends paid. As such, it is predicted that the reluctance to pay dividends will occur concurrently with underpricing for IPOs

[25] Ibbotson, Jody, and Ritter (1988) found that under-pricing averaged at 21% when they sampled 2259 US companies from 1980 to 1984. In a subsequent investigation, Ritter (1998) expanded the sample period from 1960 to 1996 to find that average under-pricing is 15%. In the UK, Levis (1993) reported that 721 IPOs issued on the London Stock Exchange between 1980 and 1988 had been underpriced by 14.3% on average, and that, thereafter, underperformance in stock price lasted for up to 36 months. However, in "hot issue markets" IPO under-pricing can attain a higher level. For example, according to Ljungqvist (2007) IPOs are under-priced on average by 71% and 57% in 1999 and 2000, respectively.

that confront asymmetric information. In the view of information delivery, dividends and discounted initial returns can be substitutes. Besides, a number of firms do not pay dividends at the stage of IPO and therefore the stock price of the first trading day cannot in practice be directly deducted from DDM. In such a case, the investment banks and/or issuing firms would intentionally lower the offer price to compensate the uninformed investors. This is also the concept of Rock's (1986) 'winner's curse' assumption. Therefore, the implication of Rock's theory (1986) and the signaling role of dividends suggest that IPOs consider underpricing as a substitute for dividends to mitigate the asymmetric information.

By contrast to Rock's (1986) 'winner's curse' idea, the principles of signaling rationale as discussed by Allen and Faulhaber (1989), Grinblatt and Hwang (1989) and Welch (1989) suggest that underpricing can function as an indicator of the intrinsic value of a company, because managers possess more information about prospect than investors do. The underlying implication is that well placed issuing firms try to 'leave a good taste' in order to woo investors and to seek future issues at more advantageous prices. Allen and Faulhaber (1989) and Grinblatt and Hwang (1989) hypothesise that high-quality IPO firms arrange low offer prices so that they are able to interpret future high dividends more favorably. However, low-quality firms are less likely to pay high future dividends because they are less likely to have sustainable future cash flows, and thus less likely to discount offer prices. This line of reasoning is similar to the assumption of a two-dimensional signal that is described by Hughes (1986). However, Michaely and Shaw (1994) find that firms who underpriced less, tended to pay higher dividends, inconsistent with the prediction of IPO signaling. Therefore, Allen and Faulhaber (1989) and Grinblatt and Hwang (1989) imply that dividends and underpricing are complementary. These controversial arguments led me to test whether dividends and underpricing are substitutes or complementary. Therefore, I set up the following testable hypothesis:

H1: *The propensity to pay dividends is negatively related to the level of underpricing.*

(2) Managerial Ownership

Leland and Pyle (1977) and Ross (1977) argue that the fraction of equity retained by insiders signals a firm's quality. When insiders are optimistic about the prospects of company, they always wish to hold more shares after the IPO. Signaling interpretations, such as those proposed by Allen and Faulhaber (1989), Grinblatt and Hwang (1989), hypothesize that well-informed IPO issuers convey information about a firm's value by retaining shares and through low offer prices. Dividend signaling principle (Bhattacharya, 1979; Miller and Rock, 1985; John and Williams, 1985) suggests that only high quality firms are able to afford the costly dividends. Moreover, disgorging dividends in post-IPO stage is optimal if managers contemplate that high directors' ownership is not sufficient for signaling firm value. By using univariate method, Kale et al. (2012) find that dividend-initiating firms have higher insider ownership than non-dividend-initiating firms, but the relevant evidence in their regression analysis is mixed. The results reported by Eckbo and Verma (1994) and Lasfer (1996)[26] are not in line with the positive relation between managerial ownership and dividend policy suggested by signaling rationale. This leads to the following testable hypothesis:

H2: *The propensity of dividend payment is positively related to the directors' stock ownership.*

(3) Lockup Agreement

A typical lockup agreement provides that directors, related parties and any relevant employees undertake to give up the right to sell a specific percentage of their shareholdings for a specified period after they are issued. The retention of managerial shares is not an adequate protection mechanism against selling (Gale and Stiglitz, 1989)[27], while lock-ups may provide enhanced information communication for outside investors. Brav and Gompers (2000) and Espenlaub, Goergen and Khurshed (2001) elaborate the role of lock-up agreements[28]in information equilibrium. Courteau (1995) and Brau, Lambson and McQueen (2005) argues that firms which are thought of as 'high-quality' often accept the severe lock-up agreements to signal inside information to new investors. Thus, firms that accept severer lock-up restriction have greater chance to pay dividends, in the spirit of the signal hypothesis in which only 'high-quality' firms favor dividends. Nevertheless, one may also argue that in case no or low dividends are

[26] Using a sample consisting of 308 firms listed in Toronto Stock Exchange over 1976-1988, Eckbo and Verma (1994) report a significant negative impact of the relative voting power of owner-managers on dividend policy. When Lasfer (1996) analyzes a sample of 108 UK companies to explore the effect of taxation on dividend policy from 1973 to 1983, he concludes that there is a negative relationship between directors' shareholdings and dividend distribution.

[27] Gale and Stiglitz (1989) argue that insiders can sell their retained shares on the secondary market as soon as they are able to do so.

[28] Brav and Gompers (2000) suggest that lockup agreements may prevent insiders from exploiting private benefit by using their superior information since lockup agreements give time for outsiders to absorb the private information of existing shareholders. Espenlaub, Goergen and Khurshed (2001) argue that issuing firms with information asymmetry will involve lockup agreements. Their argument is based on two findings: (1) High-tech firms that have greater information asymmetry are more likely to choose absolute expiry dates than other firms. According to their idea, absolute expiry dates mean less uncertainty and more transparency than flexible expiry dates. (2) Sponsor reputation can be a signaling substitute to lockup agreements.

paid out, the information asymmetry would become more serious and thus the more restrictive lockup provisions will be required.

Prior studies do not provide direct empirical evidence relating dividend policy to the lock-up covenant, with the exception of Brav and Gompers (2003) who find that the IPOs with longer than median lock-up length have lower frequency of dividend initiations than counterparts but the associated significance in their test is smaller than standard[29]. Brav and Gompers (2003) conclude that the empirical result is inconsistent with the implication of signaling mechanism. The testable hypotheses below can be suggested:

H3: *A more restrictive lockup agreement will lead to a higher propensity to pay dividends.*

(4) Institutional Ownership

The information advantage of institutional investors may contribute to explaining the dividend activities of IPOs[30]. Allen, Bernardo, and Welch (2000) contend that institutional investors have greater ability to certify the true quality of firms relative to individual investors. In consequence, high quality firms would like bear the tax cost of dividends to attract informed institutional investors who are inclined to dividend-paying firms. Allen et al. (2000) assume that institutions prefer dividends due to prudent-man rule[31] and the institutions' relative tax advantage. Based on Allen et al. (2000), Kale et al. (2012) hypothesize that firms will have stronger motivation to initiate dividends when the current level of institutional ownership is lower than what it should be. In their regression analysis, Kale et al. (2012) find a significant and positive relation between the IPOs' propensity to initiate dividends and institutional ownership deficit[32].This leads to the testable hypothesis:

H4: *Institutional ownership at IPO stage correlates negatively to future dividends propensity.*

(5) Venture Capital Backing

[29] *p*-value of difference in means=0.74.

[30] Some US-based studies focus on discussing tax-induced dividend distribution when discussing the effect of institutional ownership on dividend policy. However, the tax disadvantage of dividends is not universal in non-US environment. For instance, UK firms pay Advanced Corporation Tax on behalf of their shareholders but deducted it from their corporation tax liability (Lasfer, 1996) until the tax credit is abolished in 1999. In his research, Lasfer (1996) finds no evidence to support the widespread practice of tax-induced clientele in the UK.

[31] Allen et al. (2000) assume that institutions prefer dividends due to prudent-man rule and the institutions' relative tax advantage.

[32] It is the difference between the predicted and actual level of institutional ownership. The predicted level of institutional ownership is obtained by estimating OLS regressions with indicator variables which are suggested by literature.

The role of venture capital investors in shaping the dividend behavior of IPOs can be investigated in the context of certification hypothesis. Venture capitalists are active investors who have an important influence on corporate decision-making processes[33] because they usually possess the expertise in the area they focus and tend to play the active role in supporting firms such as external financing and IPO decisions[34] . Booth and Smith (1986) and Megginson and Weiss (1991) explicitly theorise that venture capitalists have the potential to certify the quality of IPOs. A large number of empirical investigations have documented the positive influence of venture capital backing on the long-term IPO performance[35]. However, the evidence of the impact of venture capital investor on short-run performance appears to be controversial[36].

Given the certification role of venture capitalists, the incidence of dividend initiation should increase with the involvement of venture capital investors, all else constant, in light of the dividend signaling principle. Nevertheless, if it is other potential factors, such as underwriter reputation, virtually facilitate to certify, the expected relation may not be supported. Jain et al. (2009) find that VC backing is a significantly negative factor influencing the IPOs' decision to initiate dividends. Therefore, the testable hypothesis is:

H5: *The participation of venture capitalists has a positive association with dividend policy.*

(6) Underwriter Reputation

A prestigious underwriter can serve as a certification of IPO quality (Booth and Smith, 1986; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Carter and Manaster, 1990; Holland and Horton, 1993), suggesting that better firms are more likely to collaborate with a highly trusted financial sponsor. Many empirical investigations find

[33] See Warne (1988), Gladstone (1989), Sahlman (1990), Barry, Muscarella, Peavy and Vetsuypen (1990), Megginson and Weiss (1991), Hellman and Puri (2002)

[34] See Fenn, Liang, and Prowse (1995), Gorman and Sahlman (1989), Lerner (1994), Gompers (1995)

[35] Using US IPO sample, Gompers and Lerner (1997) find that the venture capitalist reputation as well as the underwriter reputation have positive influence on the long-term IPO performance. Similarly, using UK IPO sample, Espenlaub, Garrett and Mun (1999) find that the long-run (1-36 months) aftermarket performance of venture capital-backed IPOs is better than that of counterpart IPOs. Li and Masulis (2008) find that IPOs backed by venture capital investment and are associated with stronger long-term aftermarket performance. Krishnan et al., (2011) find that IPOs with backing of more reputable VCs in their portfolio firms are associated with superior long-run performance. They also find that VCs that are more reputable hold shares of their portfolio companies at higher level.

[36] Barry et al. (1990) observe that IPO underpricing decreases when the extent to which venture capitalists involve into the IPO firms that they invested in increases. Megginson and Weiss (1991) find that venture capital-backed IPOs are less likely to be underpriced than non-venture capital-backed IPOs. However, Gompers and Lerner (1997) show that the significant short-term IPO returns have negative association with the reputation of underwriter solely. Espenlaub, Garrett and Mun (1999) also find that short-run (6 days) post-IPO returns appear to be affected by the reputation of the sponsor rather than the venture capitalists. Habib and Ljungqvist (2001) question the certification hypothesis by arguing that venture-backed IPOs are able to reduce underpricing by means of the choosing underwriters or exchanges.

that underwriter reputation can essentially influence the short-term or long-term IPO performance [37]. Allen and Faulhaber (1989) suggest that IPOs with prestigious underwriters tend to initiate dividends since ‘good firms’ have ability and demand to undertake high dividend payments. However, Jain et al. (2009) and Kale et al. (2012) only find mixed evidence[38] in support of the positive effect of underwriter prestige on the probability of dividend initiation. As such, the following hypothesis can be put forward:

H6: *IPOs with prestigious underwriters have a greater propensity to pay dividends.*

3.2.2 Agency Costs

Jensen and Meckling (1976) explicate that the separation of ownership and control causes the conflicts of interest between managers and shareholders, which will in turn lead to the increase in agency costs and the loss of firm value. Agency-costs based dividend theories articulate that dividends expose the companies to external monitoring[39] (Rozeff, 1982; Easterbrook, 1984) and reduce free cash flows under the control of managers (Jensen, 1986). As LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (2000) argued, the critical idea of the agency theories is that disgorging earnings to shareholders in form of dividends reduces the chance that managers pursue personal use. On the other hand, corporate governance also affects the agency costs and firm value essentially. Jensen and Meckling (1976) and Richardson (2006) suggest that low quality of managerial governance will cause overinvestment and damage investor wealth, especially when a great amount of free cash flow appears. Consistent with this argument, Gompers et al. (2003), Harford, Mansi, and Maxwell (2008), Masulis, Wang, and Xie (2009) demonstrate that strong governance structures enhance firm value by remedying the agency conflicts between insiders and outsiders.

Agency rationale sheds light on the link between dividend policy and corporate governance. LaPorta et al. (2000) contribute an insight into explaining how corporate governance affects dividend actions. They propose two basic models. “Outcome model” suggests that minority investors who are better protected by law have enough right to

[37] See Beatty and Ritter (1986), Titman and Trueman (1986), Maksimovic and Unal (1993), Carter and Manaster (1990), Carter, Dark and Singh (1998), Gompers and Lerner (1998a), Espenlaub, Garrett and Mun (1999), Habib and Ljungqvist (2001)
[38] In their univariate analysis, it is found that the underwriters of dividend-initiating IPOs are usually more prestigious. However, the results from multivariate analysis are not consistent.
[39] Dividend payments compel companies to raise external capital from public market in the future.

require corporate insiders to pay dividends in order to reduce cash flows under managers' control. "Substitute model" suggests that the companies with substantial moral hazard intentionally pay dividends to investors who are not well protected by law because they need to establish a reputation for future external financing. "Outcome model" predicts that superior investor protection will result in higher dividend payouts, while "substitute model" leads to an opposite prediction. Basing on large sample cross countries[40], LaPorta et al. (2000) support the "outcome model" of agency theory.

It is worthy of noting that firms differ in corporate governance not only at country level[41] but also at firm-level [42](Gompers et al., 2003; Mitton, 2004). Thus, it is of interest to study the effect of the internal corporate governance structure on IPOs' dividend choice. Consistent with LaPorta et al. (2000), recent studies[43]support that strong corporate governance (investor protection) leads to high dividend payouts. However, Jensen's (1986) substitute notion suggests that debt and dividends can be substitutes for reducing agency costs. Similarly, Officer (2006) documents that dividend payments and corporate governance can be substitutes. The following part of this study will test whether dividends and corporate governance are substitutes or complementary in the context of agency theory by employing various proxy variables such as managerial ownership, lockup agreement, institutional ownership, venture capital backing, managerial stock option and leverage.

(1) Managerial Ownership

Rozeff (1982) argues that dividend payout and directors' ownership can be viewed as substitutes for mitigating agency conflicts and predicts that firms pay higher dividends when insiders hold a lower fraction of equity. This logic is similar to the "substitute model" given by LaPorta et al. (2000) which implies that weak corporate governance leads to higher demand of dividend payouts. Smith and Watts (1992) and Gaver and Gaver (1993) propose similar arguments. In the following context of this paper, such assumption will be referred as "substitute assumption". However, the relevant evidence is controversial. In addition, the results in support of the substitution-monitoring effect have been provided by Dempsey and Laber (1992), Eckbo and Verma (1994), Moh'd et

[40] 4000 companies from 21 civil law countries and 12 common law countries.
[41] The difference in corporate governance at country level is due to the different law systems across countries as suggested by LaPorta et al. (2000).
[42] Gompers et al. (2003) use the Governance Index as proxy of the level of corporate governance. Mitton (2004) use corporate governance ratings provided by Credit Lyonnais Securities Asia (2001) to measure the level of corporate governance.
[43] Gompers, Ishii, and Metrick (2003), Dittmar, Mahrt-Smith, and Servaes (2003), Mitton, 2004; Harford et al. (2008)

al. (1995), Crutchley and Hansen (1989)[44], Collins, Saxena, and Wansley (1996), Chen and Steiner (1999) and Faccio et al. (2001). On the contrary, some empirical investigations, including Casey and Dickens (2000), Hu and Kumar (2004)[45], Morck, Shleifer, and Vishny (1988), Schooley and Barney (1994), do not support this substitute assumption.

By contrast, Rozeff (1982), Fenn and Liang (2001) suggest a complementary assumption in which the higher proportion of shares retained by managers will encourage more dividends to be distributed. Fenn and Liang (2001) argue that owner-managers as stock investors will benefit from dividend disbursement which might act as a performance-enhancing incentive. Thus, the argument of Fenn and Liang (2001) is similar to "outcome model" of LaPorta et al. (2000) which implies that strong corporate governance leads to higher demand of dividend payouts. Fenn and Liang (2001) claim that their logic is considerably similar to that of Berger, Ofek and Yermack (1997)[46]. In the following context of this paper, such assumption will be referred as "complement assumption". However, Fenn and Liang (2001) find that total corporate payouts are positively associated with management's stock ownership only when corporations experienced severe agency problems, e.g. low management stock ownership, low growth opportunities, or high free cash flow. The univariate analysis undertaken by Kale et al. (2012) reveals that dividend-initiating firms appear to have greater fraction of shares retained by the original owner at IPO comparing with non-dividend-initiating firms. However, this finding is not evident in regression analysis. Jain et al. (2009) conduct the same analysis but do not find significant relevant evidence.

In addition, Renneboog and Trojanowski (2011) argue that dividend payout is needed to diversify personal portfolio and meet individual consumption on condition that executive directors' personal wealth is being tied with shareholders' interests. In earlier literature, Demsetz and Lehn (1985), and Fama and Jensen (1983) point out that the external monitoring forces will not have important effect on insiders when managers control the substantial shares of corporate stocks. In such circumstance, managers may actively employ dividend policy as an external monitoring in order to increase firm value, leading to a positive relation between dividend policy and managerial ownership

[44] Analyzing a US-based sample covering 1977-1985, Crutchley and Hansen (1989) document a substitute relation between dividends and insider holdings in the context of reducing agency costs and point out that the trading off of benefit-cost determines the two corporate policies.
[45] For example, Hu and Kumar (2004) also find that managerial ownership does not have significant effect on dividend payout ratios once the factor of firm size is added into the model.
[46] Berger, Ofek and Yermack (1997) hypothesize that the inadequate corporate governance or serious managerial entrenchment will lead to less leverage because, in this occasion, managers have the nature to avoid firm risk and secure their personal wealth.

as well. Furthermore, the entrenchment hypothesis proposed by Farinha (2003) is distinguishable from other comparable hypotheses and predicts a U-shaped relation[47] between insider ownership and dividend policies, suggesting that when insider ownership is higher than a critical entrenchment level, the relationship between dividend policies and insider ownership can be complementary. Similar to Renneboog and Trojanowski (2011), Farinha (2003) also conjecture that managers tend to use dividends to meet the need of liquidity and diversify their personal wealth if their shareholdings are high. Therefore, to test these controversial arguments, I set up the following testable hypothesis.

H7: *Dividend payment is positively correlated with managerial ownership.*

(2) Lockup agreement

Lockup agreement possesses the potential to address agency problem. Brav and Gompers (2003) suggest that lockup agreements can align the interests of managers and investors for overcoming the moral hazard. The information asymmetry can be assumed more likely in the period following IPO. Over the lockup period, stock prices will gradually communicate private information to insiders if the market is efficient, as Ofek and Richardson (2000) argued. Moreover, as the result, agency costs are curbed to a certain extent until the expiry of lock-ups. Espenlaub, Goergen and Khurshed (2001) also suggest that lockup agreement can serve as corporate governance device. However, Brav and Gompers's (2003) commitment hypothesis is questioned by Brau, Lambson and Mcqueen (2005) who argue that lockup contracts impose only short-term restrictions on managers, whilst the monitoring ought to be an ongoing long-term process.

Prior research does not directly discuss how dividend policy and lockups are related. I conjecture that the more restrictive the lockup provisions (longer lock-up period or higher proportion of locked shares) result in the less demand of paying dividends. This logic is actually similar to the substitute assumption (Rozeff, 1982; Jensen, 1986; LaPorta et al., 2000). The testable hypothesis is as follows.

H8: *Lockup agreement has a negative effect on the willingness of dividend initiation.*

[47] It is assumed that there exists a critical entrenchment level. When insider ownership is lower than this entrenchment level, dividend policies and insider ownership can be considered as substitutes.

(3) Institutional Ownership

Institutional investors are believed to have the advantage of monitoring capability over individual investors by preceding literature (Shleifer and Vishny, 1986; Zeckhauser and Pound, 1990; Gillan and Starks, 2000)[48]. Grinstein and Michaely (2005) point out that the enhanced monitoring will lead to higher dividend payouts. Without sufficient monitoring, managers might tilt toward diverting internal surplus funds to chase personal interest. With monitoring being intensified, managers might find it become less likely for them to use free cash flow freely, thereby leading to more dividend payouts. Hence, larger institutional holdings will accompany higher payouts. In addition, Zeckhauser and Pound (1990) argue that institutional investors with strong voting power may oblige companies to increases dividends, so as to move away free cash flow from managers. Eckbo and Verma (1994) and Farinha (2003) also suggest the similar arguments. However, Grinstein and Michaely (2005)[49] and Short, Zhang, and Keasey (2002)[50] document a substitute relation between institutional ownership and dividend payout ratio. Thus, the testable hypothesis is as the following.

H9: *Institutional ownership has a positive relation with the incidence of dividend initiation.*

(4) Venture Capitalists Backing

Previous studies have discussed the monitoring mechanism of venture capitalists involvement[51]. For example, in a recent study, Krishnan et al. (2011) suggest that the monitoring offered by venture capitalists at IPO, along with VC's expertise in certain industry and advisory service, is one of reasons why the venture capitalists has the potential to certify the firms being backed by them. A gap in preceding literature is that dividend policy has not been directly related the participation of venture capitalists within the context of agency conflicts. Following the discussion in previous section, there may be two predictions. I conjecture that venture capital investors are associated with a reduction in the likelihood to pay dividends for IPO firms following a line of

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[48] Shleifer and Vishny (1986) and Zeckhauser and Pound (1990) argue that institutions are able to provide external monitoring because of their influential voting rights and that institutional investors monitor the price of shares more carefully than individual investors do. Similarly, Gillan and Starks (2000) suggest that institutional investors have greater opportunity and ability to monitor a firm's performance.

[49] The results provided by Grinstein and Michaely (2005) notably contain two levels. First, there is clear evidence that institutional investors prefer dividend-paying firms to non-dividend paying firms. Second, higher institutional ownership does not stimulate firms to increase the magnitude of corporate dividend payouts.

[50] Within framework of Linter (1956) model, Short, Zhang, and Keasey (2002) investigate a sample that consists of 211 UK firms from 1988 to 1992 and demonstrate a positive relation between institutional ownership and dividend payout ratio.

[51] Barry et al. (1990), Megginson and Weiss (1991), Chan (1983), Bergloff (1994), Hellmann (2002), Lee and Wahal (2004), Cumming and Johan (2008), Krishnan et al. (2011)

argument, which is similar to substitute assumption (Rozeff, 1982; Jensen, 1986; LaPorta et al., 2000). I set up the following hypothesis.

H10: *Venture capital backing has a negative effect on the willingness of dividend initiation.*

(5) Managerial Stock Options

Fenn and Liang (2001) argue that stock option plan can be a component of corporate governance mechanisms. Stock option plan may facilitate the alignment of interests of managers and investors and reduce the agency costs. Then, again, substitute assumption predicts that the use of stock option substitute for dividend payout to address agency problem.

Moreover, stock option plan may prompt managers to choose repurchases instead of dividends when paying out residual funds for two reasons. Firstly, Lambert, Lanen and Larcker (1989) assert that managers who have been granted stock options will have an incentive to reduce dividend payments because executive stock options are not "dividend protected" which means that dividends can negatively affect stock price given that other conditions are constant. Secondly, Bagwell and Shoven (1988), Smith and Watts (1992), Dittmar (1997), and Fenn and Liang (2001) argue that when a company faces a growth in opportunity it tends to pay payout in form of stock repurchasing rather than dividend payment, partially due to repurchases taking the advantage of the extra flexibility. The generated results are in accordance with the notion that managers tend to substitute repurchases for dividends in the presence of stock options[52]. Given above discussion, I conjecture the following hypothesis:

H11: *Stock option plans prevent IPOs from initiating dividends.*

(6) Leverage

Jensen (1986) argues that debt and dividend payment can be effective substitutes for reducing the agency costs of free cash flow because, relative to dividend payment, debt is a stronger commitment taken by entrepreneurs to pay out future cash flows since firms must face lawsuit in case of the default of interest and principal payment. This

[52] Smith and Watts, (1992), Yermack (1995), Weisbenner (2000), and Fenn and Liang (2001) find that there is a negative relationship between executive stock options and dividend payouts. Jolls (1998), Fenn and Liang (2001), Aboody and Kasznik (2001) and Liljeblom and Pasternack (2002) document a positive relationship between repurchases and management stock options. Moreover, Weisbenner, (2000) shows that repurchases will not adversely affect the exercise price of stock options.

substitution notion is supported by some subsequent studies[53]. However, contrary to the hypothesized substitution relation, Jain et al. (2009) and Kale et al. (2012) observe that debt ratio[54] of dividend initiating firms is on average significantly higher than that of non-dividend-initiating firms. A possible explanation is that, as Eije and Megginson (2008) argued, if high debt level is merely a characteristic for mature firms, then a positive relation between debt ratio and the dividend propensity is expected according to life cycle hypothesis. The substitution-monitoring effect between debt ratio and dividend payout may be evident for established firms rather than the newly listed firms at time of IPO. The above discussion leads to the following hypothesis.

H12: *Leverage level of firms at IPO stage is positively associated with the probability of dividend initiation.*

(7) Free Cash Flow and Growth opportunities

The free cash flow issue is closely linked with the growth opportunities of entrepreneurs. According to free cash flow hypothesis, dividend distribution is more important for firms with low growth prospect or high cash flows. Hence, the propensity of paying dividends is anticipated to be negatively associated with research and development expenditure (R&D)[55], capital expenditures[56] and the proxy of growth opportunities[57]. By contrast, the bearing between dividend behavior and firm size is not strong from the perspective of agency theory (Smith and Watts, 1992). Because of this uncertainty, Farinha (2003) does not give an expected sign for firm size, which is used as an indicator factor[58] when estimating OLS regressions with dividend payout ratio as dependent variables. Likewise, the prediction regarding the effect of profitability on dividend policy can uncertain under agency explanation. Farinha (2003) also infers that the relation between profitability on dividend policy is not definite; signaling suggests a positive relation while agency theory suggests a negative relation. Hence, I do not use firm size and profitability as proxy variables of agency theory.

In addition, firms that belong to high technology sectors are in need of capital

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[53] See Crutchley and Hansen (1989), Jensen, Solberg and Zorn (1992), Chen and Steiner (1999), Eije and Megginson (2008), Renneboog and Trojanowski (2011)

[54] Jain et al. (2009) and Kale et al. (2012) use the ratio of long term debt to total assets as the proxy of debt ratio and the relevant data are obtained in the year of IPO for the sample firms.

[55] See Fama and French (2001) and Kale et al. (2012) for review.

[56] See Kale et al. (2012) for review.

[57] See Fama and French (2001), Denis and Osobov (2008), Eije and Megginson (2008), Bulan et al. (2007) and Kale et al. (2012) for review.

[58] As same as Allen and Michaely (1995) and Keim (1985), Farinha (2003) observe a negative relationship between dividend payout ratio and firm size, not consistent with the assumption that larger firms suffer higher agency costs and thus need to pay more dividends.

infusion (see Wu, Erkoc and Karabuk, 2005, for review) and thus undergo less agency costs of free cash flow than firms in conventional sectors undergo undergo. Therefore, the propensity of paying dividends for high-technology firms is expected to be relatively low. Besides, AIM (the alternative investment market), launched in June of 1995, is an international market accommodating the growth and small firms. IPOs on AIM, in comparison to the main market, should display a greater reluctance to initiate dividends because of high growth. To sum up, above discussion leads to the following hypothesis.

H13: *Likelihood to initiate dividends negatively associates with R&D expenditure, capital expenditures, growth opportunities, high technology focus and AIM.*

3.2.3 Life-cycle

To explain changes in dividend policy, Grullon, Michaely, and Swaminathan (2002)[59] explicitly propose a maturity hypothesis in which the preference in dividend policy shifts with the changes in growth opportunities, capital expenditures, profitability and free cash flows at different stages of corporation development. Specifically, young start-ups are not in a position to disgorge earnings to shareholders because they need to inject capital to meet the need of abundant growth opportunities. In contrast, mature matures have higher profitability and shrinking investment opportunity, thereby overinvestment is material (Jensen, 1986). DeAngelo and DeAngelo (2006) and DeAngelo, DeAngelo and Stulz (2006) advance a more comprehensive explanation for the dynamic process of corporate dividend decisions by elaborating that there is a trade-off, which shifts along a life cycle of enterprise, between the advantage (e.g., agency cost savings) and disadvantage (e.g., cost of external financing) of distributing dividends. Consistent with the life cycle explanation of dividend policy, Fama and French (2001) find that dividends tend to paid by large firms with high profitability and less growth opportunities. In the context of life cycle, dividend activities of IPOs are related to a series of proxy variables including venture capital backing, lockup agreement and other financial variables.

(1) Venture Capital Backing

Looking at life cycle theory may locate a link between the venture capital involvement

[59] Premised on Knight (1921) and Schumpeter (1934), Mueller (1972) set up a notion that a firm experience different phases through its life.

and the dividend pattern of IPOs. A large body of literature suggests that venture capitalists prefer to invest into early-stage companies that are small, young and technology-focused (see Lerner, 1994; Gompers, 1995; Bergemann and Hege, 1998; Lee and Wahal, 2004; Krishnan et al., 2011). According to life cycle hypothesis, there is a negative correlation between venture capitalist participation and the likelihood of dividend payouts. In line with above argument, Jain et al. (2009) find that venture capitalist backed IPO firms prefer to delay dividend initiation.

In addition, cumming and Johan (2008) suggest that venture capital institutions tend to select early stage high technology firms as investment targets since they aim at achieving investment returns from capital gains[60]. Lerner (1994) argues that previous empirical studies show that venture capitalists prefer short-term investment opportunities, and they are sensitive to lockup agreements. When Field and Hanka (2001) examine US lockup agreements, they find that venture capitalists often sell more aggressively than other shareholders do when lockup agreements finally expire, and three-day abnormal return volumes are much bigger if firms are financed by venture capitalists. In addition, Bradley and Roberts (2004) have similar findings. Thus, the following testable hypothesis is:

H14: *There is a negative relation between venture capital participation and the propensity of dividend payments*.

(2) Lockup Agreement

Previous studies produce some indirect signs linking lockup agreement with the dividend pattern of IPOs through lifecycle hypothesis. First of all, Brav and Gompers (2000, 2003) report results suggesting that young firms with a low ratio of book to market, a low cash flow margin, and low-quality underwriters usually adopt longer lockup periods. Espenlaub, Goergen and Khurshed (2001) test a hypothesis of whether the IPOs underwritten by prestigious underwriters have less need for lock-up agreements, but no significant evidence is produced. Chambers and Dimson (2009) find that the reputation of underwriter and the age of IPO are positively correlated. Assuming the arguments of Espenlaub et al. (2001), and Chambers and Dimson (2009) are consistent, it should follow that a firm’s maturity has a negative relation the severity of lockup agreements. Therefore, this leads to the following hypothesis.

[60] Cumming and MacIntosh (2003), McKaskill, Weaver, and Dickson (2004) and Parhankangas, Landstrom, and Smith (2005) express the similar viewpoint.

H15: *The severity of lockup agreements is negatively related to the propensity to initiate dividends*.

(3) Free Cash Flow and Growth opportunities

Life cycle theory suggests that the extent to which a firm matures has a positive effect on the likelihood to pay dividends. Relative to young firms, mature firms are commonly characterized by large firm size, low growth and high profitability but shrinking R&D expenditure and capital expenditures. Of these variables, firm size, growth rate and profitability have been widely considered as life cycle factors in empirical studies, such as Fama and French (2001), Ferris et al. (2009) and Jain et al. (2009). A number of empirical studies document that dividend policy is associated with large firm size, lack of growth opportunities and high profitability (see Fama and French, 2001; Denis and Osobov, 2008; Eije and Megginson, 2008; Bulan et al., 2007; Kale et al., 2011 for review). Kale et al. (2012) find a significant and negative relation between the propensity to pay dividends and R&D expenditures. Nevertheless, the findings about capital expenditures are controversial in relevant studies [61]. Moreover, Eije and Megginson (2008) conjecture that leverage can be positively associated with the degree of maturity, and if so, debt and dividends are complements. However, their tests do not support this argument. On the contrary, the results from univariate comparison of Jain et al (2009) and Kale et al. (2012) illustrate that dividend-paying IPOs have higher debt level than non-dividend-paying ones, consistent with the prediction of lifecycle hypothesis. However, this finding is not evident in the multivariate analysis.

High technology firms need to retain residual capital to support R&D and marketing strategy since they face increasingly competitive environment, continuous technology transition and innovation create uncertainty (Wu, Erkoc and Karabuk, 2005). Consequently high-technology firms are often not in a position to pay dividends. The findings provided by DeAngelo, DeAngelo, and Skinner (2004) and Jain et al (2009) are in line with this prediction. Likewise, firms issued on AIM are likely to be youger and to have high growth opportunities; therefore they are more likely to decline or postpone initiating dividends relative to those on the main market. Previous studies do not provide empirical results using AIM as an explanatory variable. As such, the testable hypothesis is as the following.

[61] Jain et al. (2009) do not find a significant effect of capital expenditures. Kale et al (2011) find a significantly negative effect in probit panel regressions but the counterpart finding in univariate analysis is opposite.

H16: *The propensity of paying dividends is expected to be negatively associated with R&D expenditure, capital expenditures, the proxy of growth opportunities, high technology focus and AIM, and positively associated with firm size, profitability and leverage*.

3.2.4 Catering

Baker and Wurgler (2004a) argue that firms tend to initiate dividends when the market looks favorably on firms that pay dividends. Indeed, it could be argued that investors place a measure of sentiment on receiving dividend premiums[62], and this is the main reason, apart from making profits, why they prefer dividend-paying stocks to non-paying stocks. However, empirical evidence about what is known as 'catering theory' has produced controversial results. Baker and Wurgler, (2004a, 2004b), Li and Lie (2006), Ferris, Sen, and Yui (2006b), Neves (2006), Ferris, Jayaraman and Sabherwal (2009), Jain, et al. (2009) and Kale, et al. (2012) provide the supportive evidence of dividend catering theory. On the contrary, the results presented by Julio and Ikenberry (2004), Hsieh and Wang (2006), Bulan, et al. (2007), Chay and Suh (2008), Hoberg and Prabhala (2008), Eije and Megginson (2008) and Denis and Osobov (2008) cast doubt on catering theory. In spirit of catering theory of dividends, I have the following hypothesis.

H17: *IPOs are associated with greater chance of initiating dividends when dividend premium is high, and smaller chance of initiating dividend when dividend premium is low*.

To develop the testable hypotheses relating to the main dividend policies, the discussion so far focuses on the impact of each individual main IPO characteristics on the propensity to pay dividends. The full list of hypotheses together with supplementing references and predicted signs is in **Table 3-1**.

[62] The measure of investor sentiment is dividend premium, which is measured as the difference between the logs of the average market-to-book ratios of payers and non-payers.

Table 3-1 Expected Signs of Explanatory Factors

Main Hypotheses	Indicator Factors	Main Relevant Literature[a]	Exp Sign[b]	Obs Sign[c]	Empirical Evidence[d]
Signaling / Certification	Underpricing	Rock (1986), Ritter (1984), Beatty and Ritter (1986), Megginson and Weiss (1991), Michaely and Shaw (1994)	-	-	Michaely and Shaw (1994)
				Mixed	Kale et al. (2012)
	Underpricing	Allen and Faulhaber (1989), Grinblatt and Hwang (1989), Welch (1989)	+	-	Michaely and Shaw (1994)
				Mixed	Kale et al. (2012)
	Managerial Ownership	Leland and Pyle (1977), Ross (1977), Allen and Faulhaber (1989), Grinblatt and Hwang (1989)	+	-	Eckbo and Verma (1994), Lasfer (1996)
				Mixed	Kale et al. (2012)
	Lock-ups	Brav and Gompers (2003), Espenlaub et al. (2001), Courteau (1995), Brau et al. (2005)	+	No	Brav and Gompers (2003)
	Institutional Ownership	Allen et al. (2000), Kale et al. (2012)	-	-	Kale et al. (2012)
	VC Backing	Booth and Smith (1986), Megginson and Weiss (1991)	+	-	Jain et al (2009)
	Underwriter Reputation	Booth and Smith (1986), Allen and Faulhaber (1989), Grinblatt and Hwang (1989), Carter and Manaster (1990), Holland and Horton (1993)	+	Mixed	Jain et al (2009), Kale et al. (2012)
Bonding/Monitoring & Substitute[e]	Managerial Ownership	Rozeff (1982), Smith and Watts (1992), Gaver and Gaver (1993)	-	-	Crutchley and Hansen (1989), Dempsey and Laber (1992), Eckbo and Verma (1994), Moh'd et al. (1995), Collins, Saxena, and Wansley (1996), Chen and Steiner (1999), Faccio et al. (2001)
				No	Casey and Dickens (2000), Hu and Kumar (2004), Morck et al. (1988), Schooley and Barney (1994)
	Lock-ups	Brav and Gompers (2003), Espenlaub et al. (2001)	-	No	Brav and Gompers (2003)
	Institutional Ownership	Shleifer and Vishny (1986), Zeckhauser and Pound (1990), Gillan and Starks (2000)	-	+	Short et al(2002),Grinstein and Michaely (2005)
	VC Backing	Barry et al. (1990), Megginson and Weiss (1991), Lee and Wahal (2004), Krishnan et al. (2011), Chan (1983), Bergloff (1994), Hellmann (2002), Cumming and Johan (2008)	-	-	Jain et al. (2009)
	Managerial Stock Option	Fenn and Liang (2001), DeAngelo et al. (2004), Denis and Osobov (2008)	-	-	Smith and Watts, (1992), Yermack (1995), Weisbenner (2000), Fenn and Liang (2001)
	Leverage	Jensen (1986), Eije and Megginson (2008)	-	-	Crutchley and Hansen (1989), Jensen et al.(1992), Chen and Steiner (1999)
				+	Jain et al. (2009) and Kale et al. (2012)
	Managerial Ownership	Fama and Jensen (1983), Demsetz and Lehn (1985), Fenn and Liang (2001), Renneboog and Trojanowski (2011), Farinha (2003)	+	Mixed	Fenn and Liang (2001), Kale et al. (2012)
				No	Jain et al. (2009)

Bonding/Monitoring & Complement[f]	Lock-ups	Brav and Gompers (2003), Espenlaub et al. (2001)	+	No	Brav and Gompers (2003)
	Institutional Ownership	Grinstein and Michaely (2005), Zeckhauser and Pound (1990), Eckbo and Verma (1994), Farinha (2003), Shleifer and Vishny (1986), Gillan and Starks (2000),	+	+	Short et al. (2002),Grinstein and Michaely (2005)
	VC Backing	Barry et al. (1990), Megginson and Weiss (1991), Lee and Wahal (2004), Krishnan et al. (2011), Chan (1983), Bergloff (1994), Hellmann (2002) ,Cumming and Johan (2008)	+	-	Jain et al (2009)
	Managerial Stock Option	Fenn and Liang (2001)	+	-	Smith and Watts, (1992), Yermack (1995), Weisbenner (2000), Fenn and Liang (2001)
	Leverage	Jensen (1986), Eije and Megginson (2008)	+	-	Crutchley and Hansen (1989), Jensen et al. (1992), Chen and Steiner (1999)
				Mixed	Jain et al. (2009), Kale et al. (2012)
Agency costs of free cash flow	R&D Expenditure	Fama and French (2001), Kale et al. (2012)	-	Mixed	Jain et al. (2009)
				-	Kale et al. (2012)
	Capital Expenditures	Kale et al. (2012)	-	No	Jain et al. (2009)
				Mixed	Kale et al. (2012)
	Growth Opportunity	Fama and French (2001)	-	-	Fama and French (2001), Denis and Osobov (2008), Eije and Megginson (2008), Bulan et al. (2007), Kale et al. (2012)
	Technology Intensity	Liu (2000), Wu et al. (2005),DeAngelo et al. (2004)	-	Mixed	Jain et al. (2009)
	AIM		-		
Life Cycle	VC Backing	Lerner (1994), Gompers (1995), Bergemann and Hege (1998), Gompers and Lerner (2000, 2003), Lee and Wahal (2004), Cumming and Johan (2008) and Krishnan (2011)	-	-	Jain et al. (2009)
	Lock-ups	Brav and Gompers (2003), Espenlaub et al. (2001)	-	No	Brav and Gompers (2003)
	Firm Size	Fama and French (2001)	+	+	Fama and French (2001), Bulan et al. (2007), Denis and Osobov (2008), Eije and Megginson (2008), Kale et al. (2012)
	Growth Opportunity		-	-	
	Profitability		+	+	
	R&D	Fama and French (2001), Jain et al. (2009)	-	Mixed	Jain et al. (2009)
				-	Kale et al. (2012)

Life Cycle	Capital Expenditures	Jain et al. (2009)	-	No	Jain et al. (2009)
				Mixed	Kale et al. (2012)
	Leverage	Eije and Megginson (2008)	+	-	Eije and Megginson (2008) Crutchley and Hansen (1989)
				Mixed	Jain et al (2009), Kale et al. (2012)
	Technology Intensity	DeAngelo, DeAngelo, and Skinner (2004), Denis and Osobov (2008), Jain et al. (2009)	-	-	DeAngelo et al. (2004), Jain et al. (2009)
	AIM		-		
Catering	Catering	Baker and Wurgler's (2004a)	+	+	Baker and Wurgler's (2004b) , Li and Lie (2006), Ferris, Jayaraman and Sabherwal (2009)
				No	Hoberg and Prabhala (2008), Denis and Osobov (2009), Hsieh and Wang (2006), Bulan et al. (2006)

Table 3-1 summarizes the testable hypotheses discussed in section 3.2 and reports the expected signs suggested by literature as well as the observed signs in pervious empirical studies. These theoretical hypotheses cover the involved variables used in Chapter 3 and Chapter 4.

[a] "Main related literature" sets out the primary theoretical studies that provide the theoretical background from which the hypotheses are drawn. These studies are underlined if they directly predict the direction of the relation between dividend policy and studied variable.

[b] "Exp Sign" denotes the expected sign indicating the impact of indicator factors on the willingness of initiating dividends. The sign of "+" indicates a positive relation and "-" indicates a negative relation.

[c] "Obs Sign" denotes the observed sign in empirical studies indicating the impact of indicator factors on the willingness of initiating dividends. In addition to the signs of "+" and "-", "No" indicates that the observed sign in relevant studies is not statistically significant, and "Mixed" is marked when the result of multivariate regression model is not in line with that of univariate analysis. For example, Kale et al. (2012) find that the average underpricing for dividend-initiating companies is significantly lower than that for non-dividend-initiating companies in unvariate analysis, but this relation is not significant in multivariate analysis.

[d] "Empirical Evidence" displays the evidence obtained from the empirical analysis that studies the relation between dividend policy and indicator factors.

[e] "Bonding/Monitoring & Substitute" means that the relevant inferences are on basis of the combination of bonding/monitoring mechanism and **substitute** assumption. Rozeff (1982) originally hypothesize a substitute relation between insider stock ownership and dividend policy in sense of reducing agency costs. As stated by Fenn and Liang (2001), "Rozeff (1982) argues that insider stock ownership provides direct incentive alignment between managers and shareholders, while dividends serve as a bonding mechanism to reduce management's scope for making unprofitable investment out of internal funds. Thus, insider stock ownership and dividend policy are viewed as **substitute** means of addressing potential agency problems." Jensen (1986) explicitly suggests debt substitutes for dividends as a promise to return excess funds. The spirit of substitute assumption is also similar to that of "substitute model" by LaPorta et al. (2000) in which, in countries where the investor protection is low, managers pay dividends in order to establish reputation for future external financing.

[f] "Bonding/Monitoring & Complement" means that the relevant inferences are on basis of the combination of bonding/monitoring mechanism and **complement** assumption. In light of "outcome model" by LaPorta et al. (2000), minority investors in countries with high investor protection may force insiders to payout cash flows, implying a **complementary** relation between strong corporate governance and high dividend payment. Fenn and Liang (2001) argue that high managerial ownership intensifies corporate governance and motivates managers to disgorge more cash flows. Grinstein and Michaely (2005) argue that institutional investors act as better monitors, so managers tend to increase dividends according to Jesen's (1986) free cash flow hypothesis.

3.3 Sample and Data

3.3.1 Sample Selection

The sample comprises IPO firms listed on London Stock Exchange with an official admission date of between January 1st, 1990 and December 31, 2010. Information about the list of IPOs issued from June 27, 1995 to December 31, 2010 is obtained from The New Admissions Summary[63], which is publicly accessible from the London Stock Exchange official website. Information about the list of IPOs issued from January 1st, 1990 to June 26, 1995 is from DataStream and checked against the offering prospectuses supplied by Perfect Filings.

To guarantee that the data collected is valid for empirical analysis several exclusions are undertaken in the process of preparing the sample. Following criteria used in previous studies (e.g. Fama and French, 2001 and Denis and Osobov, 2008), IPO firms that belong to the industries of finance, investment and the utilities are excluded. Secondly, IPO firms are excluded if offering prospectuses are not available, or where offering prospectuses included incomplete information. Thirdly, IPO firms that presented erroneous information are excluded from the study. Consequently, the final sample comprised 1707 IPO firms. **Table 3-2** shows the distribution of IPOs during 1990-2010, which is comparable to the studies of Chambers and Dimson (2009), and Hoque and Lasfer (2009). To observe whether the IPO firms started to pay dividends, I track the sample IPOs until they are delisted or the end of 2011, whichever is the earliest.

3.3.2 Data Description

The variables employed in this paper are categorised into two types as IPO-related factors and basic financial accounting variables. IPO-related factors include: underpricing (i.e. first-day return), managerial stock ownership, length of lockups, percentage of locked-up shares, managerial stock option, institutional ownership, venture capital stakes, underwriter reputation, catering proxy (dividend premium), high technology dummy, and AIM dummy. The values of the IPO-related factors are fixed as

[63] New Admissions Summary contains data regarding new issues from June 27, 1995.

at the time of IPO, and remained constant across the entire sample period. The raw data regarding IPO-related variables is hand-collected primarily from the offering prospectuses supplied by Perfect Filings.

The basic financial accounting variables include firm size, profitability, growth opportunity, leverage, sales, research and development (R&D), capital expenditure, and working capital. The values of the financial variables are set as time-variant across the years included in the sample time period. The data on basic financial accounting variables and stock price is collected from DataStream. The London Stock Exchange statistics database is used to supplement the data relating to stock prices.

The variables used in my empirical investigation are defined as follows:

1. *UNDERPRICING* refers to under-pricing or initial return, which is the percentage difference between the offer price and the closing price on the first day of trading. All offer prices are sourced from prospectuses and checked against New Admissions Summary provided by London Stock Exchange. Closing prices for the first day of trading are sourced from DataStream and Bloomberg.

2. *DIRECTOR* is the percentage of directors' ordinary shares, immediately following admission.

3. *VC STAKE* is the aggregate percentage of venture capital-backed stakes, comprising more than 3% of enlarged ordinary share capital, immediately following admission. In the prospectus information, under the section Directors' and Other Interests, only non-director's stakes of more than 3% of enlarged ordinary share capital are considered. In addition, following the model of Ljungqvist and Wilhelm (2003), venture capital-backed shares included venture capital or private equity funds.

4. *VC-BACKED* is a dummy variable, which equals the value of 1 if the listing firm is VC-backed, and the value of 0 if otherwise.

5. *INSTITUTION* is the aggregate percentage of institutional stakes which are more than 3% of enlarged ordinary share capital immediately following admission (See Hoque and Lasfer, 2009).

6. *OPTION* is the percentage of executive stock options - measured as the number of shares of granted stock options divided by the enlarged ordinary shares after admission.

7. There are four variables in relation to lockup agreements:

- *INSIDER LOCKUP* and *AGGREGATE LOCKUP* refer to the locked-up director stakes and the aggregate locked-up stakes respectively. It is notable that insider shareholdings and the number of lockup directors' shares are actually different items since not all insider stock shares are subject to lockup agreements. Both Field and Hanka (2001) and Espenlaub et al. (2001) mention that the percentages of locked-up insider stock shares can be different in various lockup agreements. Moreover, lock-up agreement is a kind of mandatory discipline required by underwriters and must be accepted by issuing firms while managers are relatively free to decide how many they would like to retain previous shares. Therefore, insider stock ownership and locked-up director stakes may play as different roles in interacting with the decision to initiate dividends.

Besides, the lockup period for firms on London Stock Exchange is usually subject to two stages; shares specified as being subject to lockup are not allowed to be disposed during the first stage, and can only be sold with the consent of the underwriters during the second stage.

• *LOCKUP DAYS* refers to the log of the number of days for the first stage, and *LOCKUP CONSENT* refers to the log of the number of days for full lockup period including the first and the second stage.

8. *REPUTATION* is a measurement of underwriter reputation, and is computed as the relative market share of the investment bank as underwritten at IPO issue (Megginson and Weiss, 1991) (See Appendix 3-1 for details).

9. *AIM* is a dummy variable, which equals a value of 1 if a firm is listed on the Alternative Investment Market, and a value of 0 if otherwise.

10. *HITECH* is a dummy variable, which equals a value of 1 if the firm is a high technology firm, and 0 if otherwise. Researchers and organizations often give diverse definitions of what they class as a high technology firm. However, following Espenlaub et al. (2001), the definition used for this analysis classes high technology firms as those firms operating in sectors belonging to the TechMARK segment of the London Stock Exchange, such as Aerospace & Defence, Automobiles & Parts, Chemicals, Electronic & Electronic Equipment, Fixed Line Telecommunication, Health Care Equipment & Service, Mobile Telecommunications, Pharmaceuticals & Biotechnology, Software & Computer Service and Technology Hardware & Equipment.

11. *DP* refers to Dividend Premium, which is a catering proxy calculated as the difference between the logs of the market to book values of dividend payers and non-dividend payers (Baker and Wurgler, 2004a). Please see variable (19) for details about the approach taken in respect of calculating market to book ratio.

In addition, I use the following control variables (in case a variable is collected from DataStream, the corresponding DataStream Code will be shown in the following brackets):

- *BUBBLE* is defined as the 'internet bubble' period between 1999-2000 according to the theories of Ljungqvist and Wilhelm (2003) and Levis (2008).
- *DUMMY2000S* is a dummy variable, which is equal to 1 if IPOs are issued after December 31, 2000, but equal to 0 if otherwise.
- *LNGP* is a proxy for firm size, defined as log (IPO proceeds). IPO proceeds is calculated as the gross amounts raised at IPO in millions of pounds, and identified by the issuing firm in its offering prospectus.
- *LNASST* is a proxy for firm size, defined as log (Total Assets [07230]).
- *PROFIT* is a proxy for profitability ratio, defined as (net income [07250] + interest expense if available [01075] + deferred taxes if available [03263]) / book value of total assets [07230] (See Fama and French, 2001 and Denis and Osobove, 2008).
- *MTBV* (Market to Book Ratio) is a proxy for growth opportunities, measused (Total Assets [07230] – Common Shareholders' Equity [03501] + Market Capitalisation [08001] / Total Assets [07230]).
- *LEVERAGE* is a proxy for debt ratio, measused as Long-term debt [03251] / Total assets [07230].
- *WCAP* is a proxy for working capital, measused as Working capital [03151] / Total assets [07230].
- *R&D* is a proxy for Research & Development (R&D), measused as (R&D) [01201] / Total Assets [07230].
- *CAPEXP* is a proxy for capital expenditure, measured as Capital Expenditure per Share [05505] × Number of Shares [05326]/ Total Assets [07230].

Table 3-2 shows the propensity of firms to pay dividends out of 1707 UK IPOs issued during the period 1990–2010. Also, as illustrated by **Fig 3-1**, IPO firms that issued in the 2000s have lower probability to initiate dividends compared to in the 1990s. It can be seen that a dramatic shift in proportion of dividend-initiating IPOs occurring between 1999 and 2000. Prior to 1999, the number of dividend initiating IPOs is greater than that of non-dividend initiating IPOs. However, after 2000 fewer IPOs chose to initiate dividends. For example, it is shown that 62% of IPOs that issued in 2004 did not pay dividends until the end of 2010. These findings are consistent with the research of Denis and Osobov (2008) and Ferris, Sen and Unlu (2009) who argue that an increase in non-paying newly listed firms account for a declining trend in divided payments.

Over the entire sample period most dividend initiators started paying dividends in the first year after IPO. As reported in **Table 3-2**, over the full sample period, 524 of 799 (65.58%) dividend-initiating IPO firms initiated dividends in the first post-IPO years. Only 18.15% of dividend-initiating IPO firms started dividend payments in the second year, and this proportion is much lower in the following years. McCaffrey and Hamill (2000) document similar findings, noting that 90% of 270 UK firms initiated dividends within the first year of going public for the period from 1982 to 1991. Comparable studies show that US firms have a smaller probability to initiate dividends in the first year after IPO in comparison with UK firms. Kale et al. (2012) find that 30.7% of dividend paying firms start paying dividends in the first post-IPO year using a sample of 6588 firms listed on the U.S. markets from 1979 to 2005. Also, in a sample of 445 US firms, Jain et al. (2009) found that 49% of dividend firms initiated dividends within one year of going public from 1990 to 2000.

The statistics show that UK IPOs postponed dividend initiation during the period of time associated with the 'internet bubble' in 1999 and 2000 (Jungqvist and Wilhelm, 2003). **Fig 3-2** shows that from 1990 to 2010, the average length of time between IPO issue and dividend initiation is between 200-600 days, with the exception of a surge in the internet bubble period. The results show that the percentages of dividend-initiating IPOs that initiate dividends within one post-year are 32%, 22%, 44%, 40% and 47% for the years 1999, 2000, 2001, 2002 and 2003, respectively, which are much lower than the percent for the full sample period (65%).

Table 3-2 Yearly Distribution of Dividend Initiations

The table reports the evolution of firms that initiated dividends over post-IPO period. Column "Year" displays the IPO years during which IPO firms are issued. Column "IPO" displays the total numbers of IPOs. Column "Non-payers" displays the number of non dividend-initiating IPOs. Column "Payers" displays the number of dividend-initiating IPOs. Column "One" displays the number of dividend-initiating IPOs that start paying dividends within one calendar year (365 days) after IPO. Similarly, the following columns displays the numbers of IPOs that start paying dividends within two years (730 days), three years (1095 days), four years (1460 days) and more than four years after IPO, respectively. Parentheses in columns "Non-Payer" and "Payer" present the percentages of non-payers and payers respectively. Parentheses in following columns present the percentages of dividend-initiating IPOs that initiate dividends at different times.

Year	IPO	Non-Payer	Payer	IPOs that initiated dividends at different post-IPO years				
				One	Two	Three	Four	After Four
1990	9	2 (22%)	7 (77%)	6 (85%)	0 (0%)	0 (0%)	0 (0%)	1 (14%)
1991	8	0 (0%)	8 (100%)	8 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
1992	21	4 (19%)	17 (80%)	17 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
1993	52	9 (17%)	43 (82%)	36 (83%)	3 (6%)	0 (0%)	0 (0%)	4 (9%)
1994	104	15 (14%)	89 (85%)	71 (79%)	13 (14%)	1 (1%)	1 (1%)	3 (3%)
1995	78	26 (33%)	52 (66%)	40 (76%)	6 (11%)	2 (3%)	1 (1%)	3 (5%)
1996	136	48 (35%)	88 (64%)	73 (82%)	9 (10%)	2 (2%)	0 (0%)	4 (4%)
1997	98	29 (29%)	69 (70%)	53 (76%)	11 (15%)	1 (1%)	1 (1%)	3 (4%)
1998	66	21 (31%)	45 (68%)	30 (66%)	11 (24%)	2 (4%)	0 (0%)	2 (4%)
1999	62	31 (50%)	31 (50%)	10 (32%)	7 (22%)	0 (0%)	1 (3%)	13 (41%)
2000	190	136 (71%)	54 (28%)	12 (22%)	6 (11%)	6 (11%)	2 (3%)	28 (51%)
2001	81	52 (64%)	29 (35%)	13 (44%)	5 (17%)	3 (10%)	2 (6%)	6 (20%)
2002	56	31 (55%)	25 (44%)	10 (40%)	9 (36%)	3 (12%)	2 (8%)	1 (4%)
2003	54	37 (68%)	17 (31%)	8 (47%)	6 (35%)	2 (11%)	0 (0%)	1 (5%)
2004	178	111 (62%)	67 (37%)	41 (61%)	15 (22%)	7 (10%)	2 (2%)	2 (2%)
2005	212	149 (70%)	63 (29%)	35 (55%)	16 (25%)	1 (1%)	5 (7%)	6 (9%)
2006	166	111 (66%)	55 (33%)	31 (56%)	19 (34%)	2 (3%)	2 (3%)	1 (1%)
2007	84	57 (67%)	27 (32%)	19 (70%)	8 (29%)	0 (0%)	0 (0%)	N/A
2008	12	8 (66%)	4 (33%)	3 (75%)	0 (0%)	1 (25%)	N/A	N/A
2009	3	2 (66%)	1 (33%)	1 (100%)	0 (0%)	N/A	N/A	N/A
2010	37	29 (78%)	8 (21%)	7 (87%)	N/A	N/A	N/A	N/A
Total	1707	908 (53%)	799 (46%)	524 (65%)	145 (18%)	33 (4%)	19 (2%)	78 (9%)

Figure 3-1 Numbers of Payer IPOs and Non-Payer IPOs across Years

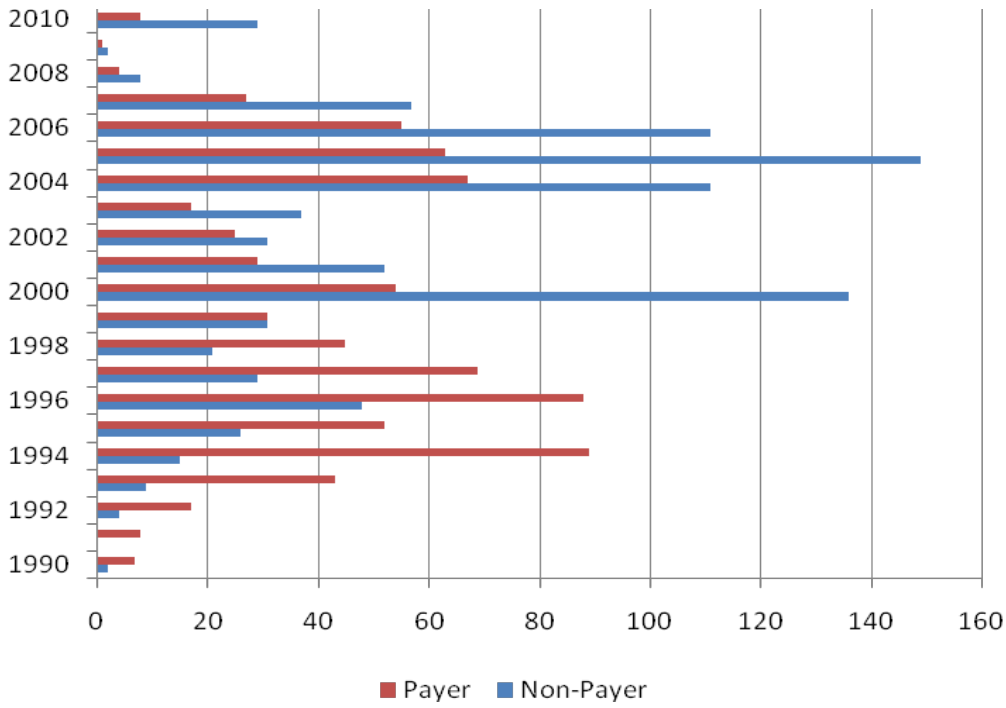
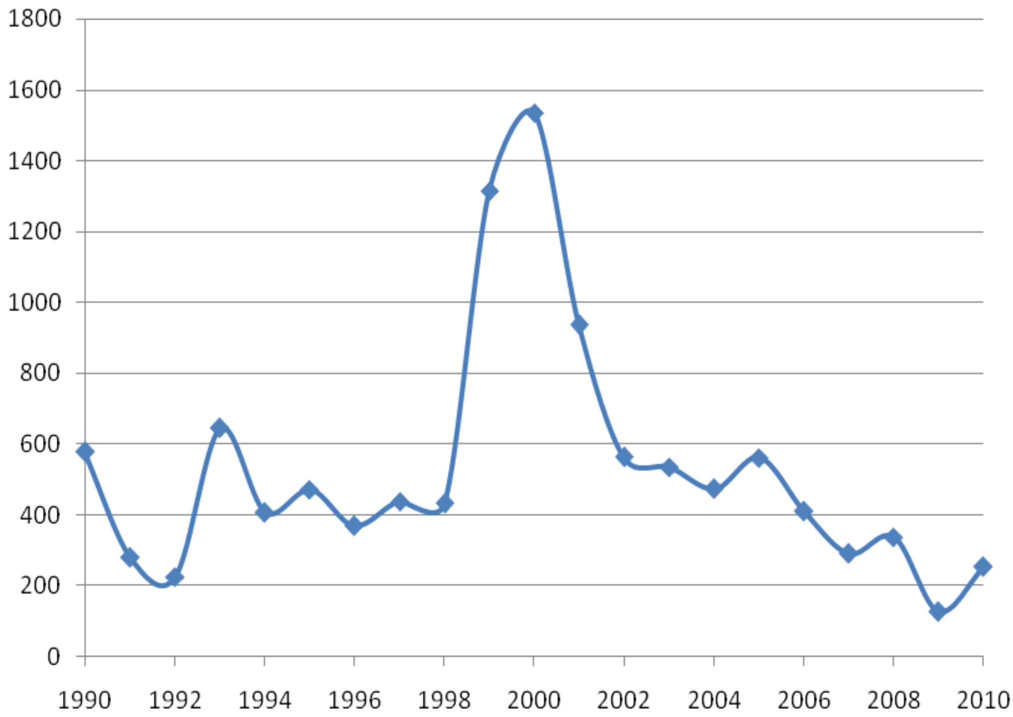


Figure 3-2 Average Number of Days from IPO to Dividend Initiations



3.4 Empirical Results

3.4.1 Univariate Analysis

Table 3-3-A presents the results of the univariate analysis in respect of the comparison between IPOs that initiate dividends and IPOs that do not initiate dividends. For each control group, the means, medians and standard deviations of indicator variables are figured out. T-statistics detailing the differences in mean values between control groups is formulated as following:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}} \tag{3-1}$$

In equation (3-1), M_1 and M_2 are mean values of the indicator variables, σ_1^2 and σ_2^2 are the variances of the indicator variables, and N_1 and N_2 refer to the number of observations for control IPO groups.

First, some results are consistent with the preceding US-based research. In accordance with Jain et al. (2009) and Kale et al. (2012), dividend-initiating IPOs exhibit lower underpricing (*UNDERPRICING*), are of a larger size (*LNGP* and *LNASST*), have higher profitability (*PROFIT*) and higher leverage (*LEVERAGE*), more reputable underwriters (*REPUTATION*), lower growth opportunities (*MTBV*) and lower R&D expenditure (*R&D*), comparing with non-initiating IPOs. Consistent with the results of Jain et al. (2009), IPOs that initiate dividends are associated with lower venture capital stakes (*VC STAKE*) and less likely to be high-technology companies (*HITECH*). Further, consistent with the results of Kale et al. (2012) IPOs that initiate dividends have higher directors' stakes (*DIRECTOR*). However, there is no significant difference in institutional ownership (*INSTITUTION*) and capital expenditures (*CAPEXP*) between control groups.

In addition, some new variables have not been examined in recent studies. The results provide a hint that the inclination to initiate dividends is adversely influenced by the severity of lockup agreement in terms of the proportion of locked-up shares and the length of lockup period. Specifically, in comparison to IPOs that did not initiate dividends, dividend-initiating IPOs are attached with lower aggregate locked-up shares (*AGGREGATE LOCKUP*) and shorter lockup periods (*LOCKUP CONSENT*). But the control groups are not found to differ significantly in locked-up director stakes

(*INSIDER LOCKUP*) and the first stage of the lockup period (*LOCKUP DAYS*).

Moreover, the other significant relations indicated in the univariate analysis are as follows. Firms with a higher percentage of managerial stock options (*OPTION*) have a lower likelihood to initiate dividends. AIM IPOs (*AIM*) have a greater reluctance to make dividend payouts in comparison with main market IPOs. The level of working capital (*WCAP*) of dividend-initiating firms is lower than that of non dividend-initiating firms.

Table 3-3-B presents the results regarding the comparisons between IPOs that initiate dividends at different times post IPO. "Within 1 Year" group includes IPOs that initiated dividends within the first post-IPO year. Accordingly, "Between 2 and 4 years" group includes IPOs that initiated dividends between 2 and 4 post-IPO years, and "After 4 years" group includes IPOs that initiated dividends after 4 Post-IPO years.

The comparison between "Within 1 Year" group and the "Between 2 and 4 years" group reveals that the earlier dividend initiations are negatively related with underpricing (*UNDERPRICING*), stock option (*OPTION*), working capital (*WCAP*), and the lockup period (*LOCKUP CONSENT*), and positively related with AIM, dividend premium (*DP*), firm size (*LNGP*, *LNASST*), and profitability (*PROFIT*).

I also conduct the comparison between "Within 1 Year" and "After 4 years". The results show that in addition to the relations revealed in the comparison between "Within 1 Year" group and the "Between 2 and 4 years" group, the earlier dividend initiations are also associated with lower proportion of aggregate locked-up shares (*AGGREGATE LOCKUP*), lower growth (*MTBV*), higher debt ratio (*LEVERAGE*) and technology focus (*HITECH*). The results in **Table 3-3-A** and **Table 3-3-B** jointly show that in many cases the characteristics associating with a greater (lower) likelihood to pay dividends will drive (impede) IPOs to start paying dividends earlier.

Table 3-3-A Means and Medians of Characteristics of Initiating and Non-Initiating IPOs

Table 3-3-A compares the key variables between the group of Initiating IPOs and that of Non-Initiating IPOs. “Full Sample” represents all IPO firms in the sample. “Initiating IPO” comprises IPOs that initiated dividends from admission date to December 31, 2011 or delisted date, whichever is earlier. “Non-Initiating IPO” comprises IPOs that do not initiated dividends from admission date to December 31, 2011 or delisted date, whichever is earlier. **Table 3-3-B** compares the key variables among three groups: “Within 1 year”, “Between 2 and 4 years”, and “After 4 years”. “Within 1 Year” comprises IPOs that initiate dividends within the first post-IPO year. “Between 2 and 4 years” comprises IPOs that initiate dividends between two and four post-IPO years. “After 4 years” comprises IPOs that initiate dividends after four Post-IPO years. The explanatory variables are as defined in Section 3.3.2.*denotes the significance of differences between control groups at 10%, ** at 5% and *** at 1%, respectively.

Variable	Full Sample				Initiating IPO (1)				Non-Initiating IPO (2)				T-stat of difference (1)-(2)
	Obs	Mean	S.D.	Median	Obs	Mean	S.D.	Median	Obs	Mean	S.D.	Median	
UNDERPRICING	1696	0.154	0.367	0.071	799	0.120	0.231	0.071	897	0.184	0.453	0.083	-3.711***
DIRECTOR	1707	0.302	0.242	0.263	799	0.312	0.252	0.263	908	0.292	0.233	0.248	1.707*
VC STAKE	1707	0.126	0.183	0.000	799	0.105	0.171	0.000	908	0.144	0.191	0.056	-4.468***
INSTITUTION	1707	0.159	0.128	0.000	799	0.155	0.145	0.000	908	0.165	0.111	0.000	-1.583
OPTION	1707	0.002	0.016	0.000	799	0.001	0.003	0.000	908	0.003	0.021	0.000	-3.993***
INSIDER LOCKUP	1538	0.266	0.239	0.197	799	0.261	0.248	0.197	908	0.270	0.230	0.229	-0.771
AGGREGATE LOCKUP	1538	0.415	0.283	0.376	799	0.378	0.284	0.376	908	0.448	0.277	0.468	-5.102***
LOCKUP DAYS	1538	5.968	0.329	5.886	684	5.977	0.368	5.886	854	5.961	0.293	5.886	0.954
LOCKUP CONSENT	1538	6.278	0.438	6.388	684	6.225	0.441	6.264	854	6.320	0.432	6.579	-4.212***
REPUTATION	1707	0.010	0.016	0.006	799	0.012	0.019	0.006	908	0.008	0.013	0.003	4.686***
AIM	1494	0.756	0.429	1.000	620	0.595	0.491	1.000	874	0.871	0.336	1	-12.105***
HITECH	1707	0.358	0.480	0.000	799	0.289	0.454	0.000	908	0.419	0.494	0	-5.642***
DP	1707	-0.368	0.125	-0.345	799	-0.34	0.138	-0.345	908	-0.393	0.107	-0.433	8.704***
LNGP	1707	0.423	0.682	0.569	799	0.613	0.659	0.569	908	0.256	0.659	0.240	11.181***
LNASST	1666	1.076	0.808	1.359	791	1.397	0.729	1.359	875	0.785	0.765	0.789	16.737***
MTBV	1664	3.377	3.144	2.209	791	2.934	2.456	2.209	873	3.778	3.613	2.689	-5.621***
PROFIT	1664	-0.100	0.339	0.066	791	0.063	0.181	0.066	873	-0.248	0.379	-0.133	21.635***
LEVERAGE	1664	0.076	0.134	0.016	791	0.102	0.146	0.016	873	0.053	0.117	0.000	7.619***
WCAP	1664	0.200	0.342	0.046	791	0.110	0.267	0.046	873	0.281	0.380	0.224	-10.714***
R&D	1664	0.004	0.551	0.000	791	-0.022	0.793	0.000	873	0.027	0.088	0.000	-1.710*
CAPEXP	1664	0.051	0.071	0.029	791	0.053	0.066	0.029	873	0.049	0.076	0.015	1.250

Table 3-3-B Means and Medians of Characteristics of Dividend-Initiating IPOs at Different Times

Variable	Within 1 year (3)				Between 2 and 4 years (4)				T-stat of difference (3)-(4)	After 4 years (5)				T-stat of difference (3)-(5)
	Obs	Mean	S.D.	Median	Obs	Mean	S.D.	Median		Obs	Mean	S.D.	Median	
UNDERPRICING	523	0.095	0.127	0.070	198	0.154	0.317	0.078	-2.527**	78	0.208	0.414	0.072	-2.387**
DIRECTOR	523	0.295	0.244	0.242	198	0.326	0.259	0.293	-1.440	78	0.394	0.271	0.349	-3.034***
VC STAKE	523	0.100	0.166	0.000	198	0.115	0.183	0.000	-1.024	78	0.115	0.173	0.000	-0.714
INSTITUTION	523	0.152	0.121	0.000	198	0.165	0.148	0.000	-1.120	78	0.147	0.118	0.000	0.355
OPTION	523	0.000	0.001	0.000	198	0.001	0.006	0.000	-2.291**	78	0.001	0.005	0.000	-1.804*
INSIDER LOCKUP	449	0.246	0.238	0.183	198	0.263	0.254	0.203	-0.805	78	0.356	0.281	0.320	-3.304***
AGGREGATE LOCKUP	449	0.368	0.277	0.367	198	0.377	0.299	0.360	-0.341	78	0.449	0.287	0.515	-2.331**
LOCKUP DAYS	449	5.987	0.379	5.886	163	5.950	0.322	5.886	1.179	72	5.980	0.397	5.886	0.146
LOCKUP CONSENT	449	6.196	0.453	6.176	163	6.293	0.405	6.479	-2.546**	72	6.254	0.429	6.292	-1.061
REPUTATION	523	0.012	0.019	0.006	198	0.012	0.019	0.005	-0.032	78	0.014	0.022	0.004	-0.740
AIM	372	0.492	0.501	0.000	179	0.765	0.425	1.000	-6.666***	69	0.710	0.457	1.000	-3.587***
HITECH	523	0.266	0.442	0.000	198	0.263	0.441	0.000	0.085	78	0.513	0.503	1.000	-4.107***
DP	523	-0.320	0.143	-0.345	198	-0.368	0.110	-0.398	4.846***	78	-0.407	0.132	-0.433	5.392***
LNGP	523	0.711	0.628	0.663	198	0.415	0.657	0.320	5.473***	78	0.455	0.729	0.417	2.951***
LNASST	516	1.523	0.674	1.433	198	1.245	0.748	1.194	4.555***	77	0.949	0.785	0.882	6.083***
MTBV	516	2.795	2.109	2.215	198	2.801	2.405	2.041	-0.034	77	4.208	3.966	2.759	-3.063***
PROFIT	516	0.094	0.107	0.077	198	0.048	0.204	0.055	3.022***	77	-0.113	0.340	-0.028	5.326***
LEVERAGE	516	0.107	0.149	0.021	198	0.101	0.145	0.016	0.541	77	0.075	0.130	0.002	2.009**
WCAP	516	0.082	0.231	0.041	198	0.135	0.285	0.066	-2.365***	77	0.237	0.382	0.079	-3.489***
R&D	516	0.005	0.041	0.000	198	0.005	0.028	0.000	0.031	77	-0.270	2.541	0.000	0.951
CAPEXP	516	0.053	0.064	0.029	198	0.054	0.070	0.028	-0.229	77	0.053	0.065	0.027	0.011

Table 3-4 Correlations between Key Variables

The explanatory variables are as defined in Section 3.3.2.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) UNDERPRING	1										
(2) DIRECTOR	0.0537	1									
(3) VC	0.0061	-0.2884	1								
(4) INSTITUTION	-0.0450	-0.1534	-0.0803	1							
(5) OPTION	0.0157	-0.0383	-0.0097	-0.0190	1						
(6) INSIDER LOCKUP	0.0567	0.9452	-0.2765	-0.1432	-0.0343	1					
(7) AGGREGATE LOCKUP	0.0375	0.5030	-0.0500	-0.0413	-0.0382	0.5711	1				
(8) LOCKUP DAYS	-0.012	0.052	-0.067	-0.013	-0.019	0.049	0.041	1			
(9) LOCKUP CONSENT	0.0122	0.0497	-0.0062	-0.0322	0.0265	0.0528	0.0719	0.5379	1		
(10) REPUTATION	-0.0438	-0.1427	0.0341	0.0063	-0.0177	-0.1411	-0.0974	-0.1761	-0.2444	1	
(11) AIM	0.0623	0.1323	-0.0584	-0.0272	0.0603	0.1251	0.1401	0.0489	0.1634	-0.3901	1
(12) HITECH	0.0525	-0.0019	0.0818	-0.0409	-0.0435	0.0054	0.0721	0.0041	-0.0017	0.0263	-0.0777
(13) DP	-0.0849	-0.0462	0.0555	0.0288	0.0274	-0.0315	-0.0346	0.0116	0.1311	0.0091	-0.0345
(14) LNGP	-0.1979	-0.1416	0.0519	0.0293	-0.1828	-0.1242	-0.0569	-0.0771	-0.1434	0.4891	-0.5482
(15) LNASST	-0.1037	-0.2158	0.1085	0.0123	-0.1195	-0.2188	-0.1956	-0.0936	-0.1120	0.4123	-0.4727
(16) MTBV	0.0842	0.1523	-0.0583	0.0434	-0.0138	0.1628	0.1623	0.0141	0.0061	-0.0380	-0.0102
(17) PROFIT	-0.0100	0.0583	-0.0475	-0.0418	-0.0499	0.0433	-0.0423	0.0293	-0.0111	0.1165	-0.1852
(18) LEVERAGE	-0.0478	-0.0449	-0.0335	0.0008	-0.0296	-0.0475	-0.0943	-0.0146	-0.0655	0.1206	-0.1546
(19) WCAP	0.0386	-0.0666	0.0488	0.0026	0.0281	-0.0587	0.0391	-0.0201	-0.0260	0.0001	0.0990
(20) STAT	-0.0880	0.2051	-0.1311	-0.0941	-0.0549	0.1973	0.0854	0.0807	0.0154	0.0215	-0.1998
(21) R&D	-0.0876	-0.0668	0.0334	0.0086	0.0009	-0.0689	-0.0301	0.0002	-0.0357	0.0096	-0.0151
(22) CAPEXP	-0.0790	0.0546	-0.0335	-0.0407	0.0088	0.0624	-0.0203	-0.0070	-0.0461	0.0462	-0.0848

Table 3-4-*Continue* Correlation Matrixes

Variable	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(12) HITECH	1										
(13) DP	-0.1164	1									
(14) LNGP	0.0655	0.0663	1								
(15) LNASST	-0.1215	0.1331	0.6979	1							
(16) MTBV	0.2179	-0.069	0.0174	-0.2787	1						
(17) PROFIT	-0.1314	0.0727	0.2028	0.4847	-0.2381	1					
(18) LEVERAGE	-0.0990	0.0491	0.1207	0.2536	-0.0764	0.0810	1				
(19) WCAP	0.1680	-0.0541	0.0063	-0.0384	0.0391	-0.0317	-0.3106	1			
(20) STAT	0.0156	0.0234	0.1083	0.0529	0.0614	0.2963	0.1004	-0.3054	1		
(21) R&D	0.0584	0.0285	0.0083	0.0506	-0.0523	0.0463	0.0097	-0.0327	0.0187	1	
(22) CAPEXP	-0.0442	0.0718	0.1154	0.0645	0.0213	-0.0337	0.1641	-0.1226	0.0885	0.0210	1

3.4.2 Multivariate Binary Logistic Regression Model

In order to investigate the factors influencing the decision to initiate dividends, a multivariate logistic model equation is formulated.

$$log\left(\frac{P(y_i = 1|X_i)}{P(y_i = 0|X_i)}\right) = \beta_0 + \beta_i X_i \qquad (3-2)$$

In this test, one observation corresponds to one firm that issued initial public offerings in the period from Jan 1st 1990 to Dec 31st 2010. The dependant variable takes on the value of 1 if a firm initiated dividend within three years post-IPO, and the value of 0 otherwise. Dividend initiation is defined as an event of a publicly trading firm made its first cash dividend payment during the post-IPO period. I apply this dependant variable mainly due to the following considerations. First, as **Table 3-2** shown, 89% of dividend initiations in the sample occurred within three years after IPO (65% in the 1st year, 18% in the 2nd year, and 4% in the third year), thus whether or not a firm made the first dividend payment in three post-IPO years can reflect basically its inclination of paying dividends. Second, whilst there are 3 observations in 2009 and 37 observations in 2010 for which we can not observe whether they initiated in three post-IPO years, this will not affect significantly the robustness of the data since these observations only account for 2.34% of the sample population (1707). I also conduct two robust tests to check if my results are sensitive to the sample specification and the selection of dependant variable.

In equation (3-2), X_i represents the vector of control variables that defined in section3.3.2, and 'i' indicates the number of control variables in each model. The values of the explanatory variables are measured in the fiscal year of IPO, and, thus, this cross-sectional logistic test does not capture the effect of time-varying factors. For instance, the values of profitability (*PROFIT*) should change over the post-IPO time in fact, but a cross-sectional logistic model only captures the predictive effect of firms' profitability as recorded at time of IPO.

Model verification is necessary for multivariate regression models in order to assure the robustness of estimation. Incorporating highly interrelated predictor variables that carry overlapping information can lead to the biased estimation of parameters[64]. In this study, a set of measures are taken to reduce the risk of multicollinearity. First,

[64] Kale et al. (2012) include more than twenty variables in one regression, thus the potential risk of multi-collinearity increases.

highly correlated variables such as *LOCKUP DAYS* and *LOCKUP CONSENT* that act as a proxy of the length of lockup, are not used in one regression specification at same time. Second, if the parameter estimates are sensitive to the inclusion of another control variable, the variable vector is adjusted in order to boost the adequacy of the model. Finally, the variable vector is verified by referring to the results obtained from the univariate analysis. If there is significant difference in results, the variable vector is adjusted as well. By taking these measures, eight model specifications are constructed. Models (1)-(4) control for the IPO-specific factors only and Models (5)-(6) control for both IPO-specific variables and financial accounting variables.

Table 3-5 indicates some significant interrelationships that are consistent with the results obtained in univariate comparisons (**Table 3-3-A, B**). The estimated coefficients of managerial ownership (*DIRECTOR*), underwriter reputation (*REPUTATION*), catering proxy (*DP*), firm size (*LNGP* and *LNASST*), and profitability (*PROFIT*) are positive and significant in all models that include these relevant variables. Consistent with the signaling-based hypotheses, the higher director ownership (*DIRECTOR*) and the higher underwriter reputation (*REPUTATION*) provide the certification to high quality firms who have stronger motivation and necessity to pay dividends as signaling. The results on *LNGP*, *LNASST* and *PROFIT* support the lifecycle hypothesis as mature firms are characterized as large size and high profitability (e.g. Fama and French, 2001). The coefficients of LEVERAGE are significantly positive in all revolved models expect in Model (6) the coefficient is not significant (*p*-value=0.128). Lifecycle hypothesis also provide a plausible explanation for the result on *LEVERAGE* as it is possible that at the IPO stage the established firms tend to have high debt ratio and more likely to pay dividends (Eije and Megginson, 2008).

In contrast, the estimated coefficients of venture capital backing (*VC-BACKED*), venture capital-backed stakes (*VC STAKE*), managerial stock option (*OPTION*), AIM dummy (*AIM*), high-technology dummy (*HITECH*), dotcom bubble dummy (*BUBBLE*), 2000s dummy (*DUMMY2000S*), market-to-book ratio (*MTBV*), R&D and working capital (*WCAP*) are all significantly negative in all models that include these relevant variables. These results can be related to free cash flow hypothesis and lifecycle hypothesis. For instance, IPOs issued on AIM, defined as a growth market, have relatively lower probability to initiate dividends since the cashflows generated need to be used to support investment opportunities. Similarly, previous studies suggest that young and high growth firms are likely to be VC-backed[65], committed to lockup shares for a longer period[66] and from the technology-focused industries[67]. . It is not surprising that IPOs issued during internet bubble period are less likely to pay dividends since they are normally more technology-focused. The finding on *DUMMY2000S* may suggest a tendency that the newly listes firms are becoming more reluctant to pay dividends (e.g. Fama and French, 2001; Denis and Osobov, 2008). The findings on *VC-BACKED,VC STAKE* and *OPTION* are in line with the substitute assumption of agency costs which suggests that dividends and other instruments of addressing agency conflicts adversely related.

However, the results show that the coefficients of underpricing (*UNDERPRICING)* are negative in all model specifications but not significant in Models (3), (5), (6) and (7) which include firm size related control factors such as AIM, LNGP and LNASST. This suggests that the effect of underpricing on dividend decision is sensitive to the inclusion of the firm size. Similarly, the coefficients of the full lock-up period (*LOCKUP CONSENT*) and the aggregate locked-up shares (*AGGREGATE LOCKUP)* are significant and negative in Model (2) and (8) respectively, consistent with the suggestions of substitution assumption of agency theory and lifecycle theory. But the coefficients of *LOCKUP CONSENT* and *AGGREGATE LOCKUP* are not significant in Model (6) and (4). The coefficient of capital expenditure (*CAPEXP*) is only significantly negative in Model (7). Besides, I find on significant coefficients for *INSIDER LOCKUP* length of first lock-up period (*LOCKUP DAYS*), and institutional ownership (*INSTITUTION*).

[65] See Lerner (1994), Gompers (1995), Bergemann and Hege (1998), Lee and Wahal (2004), and Krishnan et al.(2011)
[66] See Brav and Gompers (2000, 2003)
[67] See DeAngelo, DeAngelo, and Skinner (2004), Denis and Osobov (2008), and Jain et al. (2009)

Table 3-5 Logistic Regressions on Whether Firms Initiate Dividends within Three Years Post-IPO

The table reports the results from estimating logistic regressions on a sample of IPOs during the period 1990-2010. The dependent variable equals to one if an IPO firm initiated dividend during the three post-IPO years, whichever is the earliest, and zero otherwise. The explanatory variables are as defined in Section 3.3.2.The *t*-statistics of the differences between control groups are presented as well. *, **, and ***denote significance at 10%, at 5% and at 1% respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
UNDERPRICING	-0.462**	-0.444**	-0.167	-0.604**	-0.593	-0.771	-0.292	-1.214***
	(0.015)	(0.021)	(0.329)	(0.010)	(0.254)	(0.259)	(0.264)	(0.061)
OPTION	-1.10***	-1.088***	-0.754***	-0.853***	-0.77**	-0.723**	-1.42**	-0.987**
	(0.008)	(0.01)	(0.009)	(0.006)	(0.033)	(0.041)	(0.015)	(0.015)
INSTITUTION	-0.302	-0.48766			-0.500	-0.593		
	(0.488)	(0.26)			(0.370)	(0.316)		
DIRECTOR			0.985***				0.785***	
			(0.000)				(0.010)	
VC STAKE		-1.17647***		-0.831**		-1.030***		-0.556
		(0.000)		(0.011)		(0.009)		(0.128)
VC-BACKED	-0.508***		-0.560***		-0.478***		-0.544***	
	(0.000)		(0.000)		(0.001)		(0.000)	
INSIDER LOCKUP	0.194				-0.369			
	(0.426)				(0.271)			
AGGREGATE LOCKUP				-0.174				-0.465*
				(0.430)				(0.090)
LOCKUP DAYS			0.257				0.258	
			(0.185)				(0.211)	
LOCKUP CONSENT		-0.496***				-0.214		
		(0.000)				(0.178)		
REPUTATION				22.719***				10.010**
				(0.000)				(0.023)
AIM			-1.883***				-1.894***	
			(0.000)				(0.000)	
HITECH			-0.614***	-0.632***			-0.608***	-0.461***
			(0.000)	(0.000)			(0.000)	(0.002)
DP	3.309***	3.195***			2.517***	1.968***		
	(0.000)	(0.000)			(0.000)	(0.000)		

BUBBLE			-0.603***				-1.530***	
			(0.001)				(0.000)	
DUMMY2000S				-1.674***				-1.350***
				(0.000)				(0.000)
LNGP					0.567***			
					(0.000)			
LNASST						0.815***		
						(0.000)		
MTBV					-0.132***			-0.102**
					(0.001)			(0.013)
PROFIT					9.205***	8.496***		8.828***
					(0.000)	(0.000)		(0.000)
LEVERAGE					2.692***	0.850	1.651***	3.006***
					(0.000)	(0.128)	(0.001)	(0.000)
WCAP						-1.626***	-0.887***	
						(0.000)	(0.000)	
R&D					-0.431***			-0.377***
					(0.000)			(0.003)
CAPEXP					-1.293		-1.725*	-1.641
					(0.200)		(0.070)	(0.119)
Constant	1.422***	4.441***	-0.129	1.268***	1.090***	1.299	-0.038	1.245***
	(0.000)	(0.000)	(0.912)	(0.000)	(0.000)	(0.223)	(0.976)	(0.000)
N	1527	1527	1354	1527	1496	1495	1326	1496
Pseudo R^2	0.068	0.0713	0.146	0.155	0.378	0.407	0.218	0.400

3.4.3 Cox Proportional Hazard Model

In addition to examining the decision to initiate dividends, this chapter investigates the decision-making on the timing of dividend initiation. To fulfill this objective, I employ Cox Proportional Hazard model (Cox model) which is extensively applied in survival analysis because of its nature to estimate factors that influence the timing of events on censored observations (Shumway, 2001; Bulan et al., 2007; Jain et al. 2009; Kale et al. 2011). The fundamental formulation of Cox model is:

$$h(t) = h_0(t)e^{(b_1x_1+b_2x_2+\cdots+b_kx_k)} \quad (3-3)$$

In Equation (3-3), $h(t)$ represents the hazard function, which can be estimated as the proportion of individuals who experience the event of interest in a certain time interval (Allison, 1995 and LeClere, 2000). The equation $\mathrm{h}_0(\mathrm{t})$ represents the baseline hazard or the hazard for an individual when all the covariates are equal to 0. The hazard function or the log of the hazard function is a function of the control variable $(x_1, x_2, \cdots x_k)$ and the parameters of the covariates $(b_1, b_2, \cdots b_k)$. Coefficients of the proportional hazards model are estimated by maximizing the partial likelihood[68], suggesting that the baseline hazard function $\mathrm{h}_0(\mathrm{t})$ did not have to be specified. In other words, $\mathrm{h}_0(\mathrm{t})$ is an unknown parameter in the process of estimation, thus Cox model can be described as a kind of semi-parametric model.

In this test using Cox model, the event of interest is the incidence of dividend initiation, and IPO firms that did not initiate dividends are censored until they started to pay dividends or were delisted. Time to event is measured as the number of days from the IPO date to the date when firms left the sample because of dividend initiation, delisting or takeover or to December 31, 2011.The model specifications are as same as the logistic models in **Table 3-5**. A positive (negative) coefficient indicates that there is a positive relation between the control variables and the incidence of event. According to Allison (1995), a hazard ratio represents the percentage change of the hazard caused by a unit increase in the covariate when controlling for other covariates. Relative Hazard Ratio can be formulated as:

$$\frac{h(t)}{h_0(t)} = e^{(b_1x_1+b_2x_2+\cdots+b_kx_k)} \quad (3\text{-}4)$$

When controlling for other covariates, the hazard ratio of a certain control

[68] Efron (1977) suggests that partial likelihood estimation is efficient, especially when applied to the analysis of a large sample.

variable is equal to 1 when the corresponding parameter is valuated as 0 (i.e. e^0=1). This means that the associated covariate does not have any effect on the timing of dividend initiation. A hazard ratio which exceeds1 represents that the associated covariate causes an earlier dividend initiation. In contrast, a hazard ratio of less than 1 indicates that the associated covariate brings about delayed dividend initiation.

Table 3-6 details the results from estimating the multivariate Cox model. Overall, the variables with a positive (negative) effect on the decision to distribute dividends will trigger a shorter (longer) duration between IPO and the first dividend payment. The results show that the time to dividend initiation generally shortens as the increase in the values of directors' ownership (*DIRECTOR*), underwriter reputation (*REPUTATION*), catering proxy (*DP*), firm size (*LNGP* and *LNASST*), profitability (*PROFIT*) and long-term debt ratio (*LEVERAGE*). Accordingly, all these control variables have hazard ratios that are greater than 1, suggesting that these factors stimulate IPOs to speed up dividend initiation. For instance, as reported in Model (4), underwriter reputation (*REPUTATION*) is shown to be a highly efficient interpreter for the timing of dividend initiation as its hazard ratio of 120.24.

In line with the results from the logistic models (**Table 3-5**), the estimated coefficients of venture capital involvement (*VC-BACKED*), venture capital stakes (*VC STAKE*), full lockup period (*LOCKUP CONSENT*), AIM dummy (*AIM*), high-technology dummy (*HITECH*), dotcom bubble dummy (*BUBBLE*), *DUMMY2000S* and working capital (*WCAP*) are significantly negative. Besides, Managerial stock option (*OPTION*) has significant and negative parameters in the majority of the interrelated models except for Model (6) (p-value=0.175). In addition, the corresponding relative hazard ratios for these variables are less than one. These results suggest that these factors interrelate with the delay of dividend initiation.

Some control variables are not significant in all affiliated models. For example, the coefficients of underpricing (*UNDERPRICING*) are negative and significant in Models (1), (2), (4), (6) and (8) but insignificant in Models (3), (5), and (7) when size factors (AIM, *LNGP* and *LNASST)* are controlled. This suggests that underpricing has a general adverse influence on the time to dividend initiation, but this influence is sensitive to firm size. Similarly, the coefficient of locked-up managerial shares (*INSIDER LOCKUP*) is significant at 10% level in Model (1) but insignificant in Model (5) and (8). Market-to-book ratio (*MTBV*) is negative and significant at 1% and 10% in Model (5) and Model (8) respectively. Moreover, institutional ownership

Table 3-6 Cox Proportional Hazard Models on The Timing of Dividend Initiation

The table presents the results from estimating Cox Proportional Hazard Models for IPOs during the period 1990-2010. The dependent variable is the hazard function (see Allison, 2000). HR is the hazard ratio as defined in Equation (3 - 4).The explanatory variables are as defined in Section 3.3.2.The *p*-values are reported in parentheses and significance levels are indicated. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	(1)		(2)		(3)		(4)	
	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio	Coefficient	Hazard Ratio
UNDERPRICING	-0.415***	0.661	-0.449***	0.638	-0.148	0.862	-0.476***	0.621
	(0.003)		(0.003)		(0.302)		(0.002)	
OPTION	-0.872**	0.000	-1.077***	0.000	-0.783**	0.000	-0.723**	0.000
	(0.037)		(0.008)		(0.022)		(0.026)	
INSTITUTION	-0.343	0.710	-0.239	0.787				
	(0.177)		(0.469)					
DIRECTOR					0.498***	1.646		
					(0.007)			
VC STAKE			-0.818***	0.441			-0.516**	0.597
			(0.000)				(0.018)	
VC-BACKED	-0.402***	0.669			-0.365***	0.694		
	(0.000)				(0.001)			
INSIDER LOCKUP	-0.267*	0.766						
	(0.050)							
AGGREGATE LOCKUP							-0.168	0.846
							(0.165)	
LOCKUP DAYS					0.078	1.081		
					(0.565)			
LOCKUP CONSENT			-0.361***	0.697				
			(0.000)					
REPUTATION							9.395***	120.243
							(0.000)	
AIM					-1.430***	0.239		
					(0.000)			
HITECH					-0.547***	0.578	-0.517***	0.596
					(0.000)		(0.000)	
DP	2.567***	13.024	2.514***	12.356				
	(0.000)		(0.000)					
BUBBLE					-0.728***	0.483		
					(0.000)			
DUMMY2000S							-1.057***	0.348
							(0.000)	

Variable	(5) Coefficient	(5) Hazard Ratio	(6) Coefficient	(6) Hazard Ratio	(7) Coefficient	(7) Hazard Ratio	(8) Coefficient	(8) Hazard Ratio
N	1696		1527		1354		1696	
χ^2	166.17		125.69		235.16		267.37	
UNDERPR	-0.198	0.820	-0.322*	0.725	-0.154	0.857	-0.509***	0.095
	(0.136)		(0.065)		(0.332)		(0.001)	
OPTION	-0.355*	0.00	-0.463	0.00	-0.769***	0.00	-0.679***	0.000
	(0.064)		(0.175)		(0.009)		(0.001)	
INSTITUTION	-0.266	0.767	-0.109	0.897				
	(0.383)		(0.762)					
DIRECTOR					0.429**	1.535		
					(0.048)			
VC STAKE			-0.669***	0.512			-0.311	0.166
			(0.002)				(0.171)	
VC-BACKED	-0.302***	0.740			-0.331***	0.718		
	(0.000)				(0.000)			
INSIDER LOCKUP	-0.174	0.840						
	(0.349)							
AGGREGATE LOCKUP							-0.216	0.117
							(0.137)	
LOCKUP DAYS					0.072	1.074		
					(0.606)			
LOCKUP CONSENT			-0.227***	0.797				
			(0.011)					
REPUTATION							6.177***	880.723
							(0.001)	
AIM					-1.357***	0.257		
					(0.000)			
HITECH					-0.458***	0.632	-0.150*	0.078
					(0.000)		(0.098)	
DP	1.728***	5.631	1.569***	4.800				
	(0.000)		(0.000)					
BUBBLE					-0.632***	0.531		
					(0.000)			
DUMMY2000S							-0.806***	0.036
							(0.000)	
LNGP	0.395***	1.485						
	(0.000)							
LNASST			0.479***	1.615				
			(0.000)					

MTBV	-0.057*** (0.001)	0.945					-0.036** (0.023)	0.015
PROFIT	2.999 (0.000)	20.072	2.845*** (0.000)	17.197			2.643*** (0.000)	2.164
LEVERAGE	1.676*** (0.000)	5.344	0.816** (0.012)	2.261	1.279*** (0.000)	3.594	1.785*** (0.000)	1.598
WCAP			-0.830*** (0.000)	0.436	-0.550*** (0.000)	0.577		
R&D	-0.209 (0.823)	0.811					-0.206*** (0.000)	0.037
CAPEXP	-0.296 (0.640)	0.744			-0.797 (0.163)	0.451	-0.095 (0.864)	0.507
N	1663		1495		1326		1496	
χ^2	396.7		377.1		494		668.46	

(*INSTITUTION*), aggregate locked-up shares (*AGGREGATE LOCKUP*), length of first lock-up stage (*LOCKUP DAYS*), R&D ratio and capital expenditure ratio (*CAPEXP*) demonstrate no constant significant relationship to initiation timing.

3.4.4 Multivariate Logistic Panel Regression Model

In order to analyse the impact of time series financial accounting variables on the decision of paying dividends, I use panel data methodology which has the advantage over cross-sectional data in capturing the dynamics of variables and provides more efficient econometric estimates by increasing the number of data points (Hsiao, Mountain and Ho-Hillman, 1995). In this section, time-series proxy variables include size (*LNASST*), growth opportunities (*MTBV*), profitability (*PROFIT*), long-term debt ratio (*LEVERAGE*), capital expenditures (*CAPEXP*) , *R&D* and working capital (*WCAP*). In addition, the IPO-related variables used in the previous tests are still controlled.

The panel sample is constructed following a procedure developed by Kale et al. (2012). Dividend initiation is defined as an event of a publicly trading firm made its first cash dividend payment during the post-IPO period. If a firm initiated dividends from its IPO date to December 31, 2011, it is defined as a dividend-paying firm at the year of dividend initiation, and as a non-dividend paying firm for all the preceding years. Firms are taken out of the sample once they started paying dividends. However, if a firm did not initiate dividends until December 31, 2011, or its delisted date, it is defined as a non-dividend paying firm. Therefore, the tested sample is subject to an unbalanced pool data (Wooldridge, 2002).

The formulation of the multivariate logistic panel regression is as follows:

$$log\left(\frac{P(y_{it} = 1|X_{it})}{P(y_{it} = 0|X_{it})}\right) = \beta_0 + \beta_i X_{it} \qquad (3-4)$$

In equation (3-4), the firm-year dependent variable is a dichotomous variable, which assumes the value of 1 if a firm initiated dividends and 0 otherwise. $\mathrm{X_{it}}$ represents the vector of control variables as defined in section 3.3.2 for each sample year. For each individual ‘i’ in the population, there a binary response y_{it} applies for each sample year. This panel-data based analysis uses Models (5)-(8) in which the time-series covariates are included.

It is crucial that the time-series correlated standard errors for the logistic panel model should be validated (Wooldridge, 2002). Petersen (2009) points out that clustered standard errors are likely for panel regressions and that the bootstrap method[69] is a solution for addressing correlated standard errors (e.g. Efron and Tibshirani, 1986; Horowitz, 2001; Kayhan and Titman, 2007). Testes conducted by Cheng, Nagar, Rajan (2005), Petersen (2009), and Greene (2010) show that the bootstrapping procedure is efficient in detecting and correcting the clustered standard errors. Also, Bulan et al. (2007) and Kale et al. (2012) apply the method of bootstrapping to estimated standard errors in probit or logit panel regression models. Therefore, I use the bootstrapping method with 200 iterrations to deal with the time-series clustering in this section.

Table 3-7 shows the results from estimating the unbalanced panel logistic model. The coefficients of lifecycle variables including *LNASST*, *MTBV* and *PROFIT* are highly significant and have the same signs as suggested by previous studies such as Fama and French (2001) who argue that large firms with low growth opportunities and high profitability tend to pay dividends. However, contrary to the prediction of free cash flow hypothesis, the results show that dividend-initiating firms have a higher level of capital expenditures (*CAPEXP*). Recent relevant papers (Denis and Osobov, 2008; Eije and Megginson, 2008; Ferris et al., 2009; Alzahrani and Lasfer, 2012) do not control for capital expenditures in their regressions on dividend policy. Fama and French (2001) (P.16) state that ‘some readers express a preference for capital expenditures (roughly the change in long-term assets), rather than the change in total assets, to measure investment. Our view is that short-term assets are investments.’ A possible signaling-based explanation is that high capital expenditures signal firms’ capability to sustain future dividend payments.

The results also show that *LEVERAGE* is positive and significant in Model (7) and (8). However, when I control for firm size using *LNASST* in Model (5) and (6), the coefficient of *LEVERAGE* is not significant. Working capital (*WCAP*) is significantly negative in Model (6), but this factor becomes insignificant in Model (7). However, *R&D* is not significant in all models (Model (5) and (8)). Moreover, the remaining results in respect of IPO-related elements are qualitatively in line with the results obtained from cross-sectional logistic analysis and Cox models. One exception is that

[69] Bootstrapping is a popular re-sampling method and Monte Carlo simulation. It can be used as an alternative to using asymptotic approximations for detecting standard errors, confidence intervals, and *p*-values for test statistics. Computer simulations can be used to estimate complicated non-linear models when traditional optimization methods are not effective (Wooldridge 2000). The equation for Bootstrap Estimation of Standard Error is: $\widetilde{se}B(\tilde{\theta}\,*) = \sqrt{\frac{1}{B-1}\sum_{b=1}^{B}(\tilde{\theta}^{(b)} - \overline{\tilde{\theta}\,*})^2}$, where $\overline{\tilde{\theta}\,*} = \frac{1}{B}\sum_{b=1}^{B}\tilde{\theta}^{(b)}$

Table 3-7 Logistic Regression on Decision to Initiate Dividends basing on Unbalanced Panel Data

The table presents the results from estimating logistic panel regressions on the sample of all the firms that conducted IPOs during the period 1990-2010. A firm is defined as a dividend initiator in the year of dividend initiation and as a non-dividend initiator for all preceding years. If a firm starts paying dividend then it will be excluded from the sample. If a firm does not initiate dividends until the end of 2010 or delist date, it is classified as non-dividend initiator for all years. One observation refers to one firm in one observed year. The dependent variable is a dichotomous variable that equals to one if one observation initiates dividend and zero otherwise. The explanatory variables are as defined in Section 3.3.2. *p*-values are reported in parentheses and significance levels are indicated. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	(5)	(6)	(7)	(8)
UNDERPRICING	-0.359*	-0.477**	-0.582**	-0.299
	(0.077)	(0.044)	(0.044)	(0.123)
OPTION	-57.642*	-82.695**	-114.678**	-68.772**
	(0.077)	(0.024)*	(0.020)*	(0.032)
INSTITUTION	-0.347	-0.105		
	(0.376)	(-0.826)		
DIRECTOR			0.816**	
			(0.012)	
VC STAKE		-1.036***		-0.389*
		(0.001)		(0.099)
VC-BACKED	-0.436***		-0.509***	
	(0.000)		(0.000)	
INSIDER LOCKUP	-0.301			
	(0.156)			
AGGREGATE LOCKUP				-0.148
				(0.354)
LOCKUP DAYS			0.211	
			(0.263)	
LOCKUP CONSENT		0.037		
		(0.771)		
REPUTATION				7.145**
				(0.020)
AIM			-1.959***	
			(0.000)	
HITECH			-1.006***	-0.299***
			(0.000)	(0.007)
DP	-0.108	0.002		
	(0.792)	(0.995)		
BUBBLE			-0.328*	
			(-0.074)	
DUMMY2000S				-1.314***
				(0.000)
LNASST	0.806***	0.870***		
	(0.000)	(0.000)		
MTBV	-0.095***			-0.155***
	(0.001)			(0.000)
PROFIT	7.106	6.579		6.212***
	(0.000)**	(0.000)**		(0.000)
LEVERAGE	-0.046	0.169	0.857**	0.865***
	(0.905)	(0.690)	(0.038)	(0.010)
WCAP		-0.497**	-0.142	
		(0.012)	(0.426)	
R&D	-0.482			-0.386
	(0.827)			(0.746)
CAPEXP	3.025***		2.612***	2.041***
	(0.000)		(0.001)	(0.001)
Constant	-2.626***	-3.109***	-1.900	-0.598***
	(0.000)	(0.000)	(0.094)	(0.000)
Obs	6303	5735	5532	6303
χ^2	335.8	304.61	256.27	511.29

the full length of lock-up period (*LOCKUP CONSENT*) does not have explanatory power in Model (6).

3.5 Robustness Tests

In this section, I test for robustness of my results from estimating cross-sectional logistic regressions, Cox proportional hazard model regressions and logistic panel regressions.

3.5.1 Robustness Test for Cross-sectional Logistic Regression Model

Firstly, I carry out two logistic regression models to check the results reported in **Table 3-5**. In the first checking logistic regression model, the dependant variable is set as one if a firm initiated dividends within one post-IPO year and zero otherwise. Comparing with the original logistic model for which the dependant variable has a value of one if dividend initiation happened within three post-IPO year, the checking logistic regression allows the IPOs in 2009 and 2010 to be estimate as equally as the earlier IPOs in other years. However, it undermines the sample representativeness as it treats the 2nd-year payers who account for 18% of dividend initiating IPO firms as non-payers.

In the second checking regression model, the dependent variable equals to one if an IPO firm initiated dividend from admission date to December 31, 2010 or delisted date, whichever is the earliest, and zero otherwise. It boosts the sample representativeness by distinguishing all the dividend initiating firms form non-initiating firms. However, it does not estimate equally the IPOs issued in different years.

Table 3-8 and **Table 3-9** report the results from estimating the two logistic regression models. In general, these estimates are qualitatively similar to the results reported in **Table 3-5**. All coefficient signs are unchanged except for the coefficient of R&D in **Table 3-8,** Model (8). There are some changes in the significance of the estimated coefficients. For instance, different from the results in original model, the coefficients of managerial ownership are not significant using the first checking regression (**Table 3-8**). However, the estimated coefficients of managerial ownership using the second checking regression (**Table 3-9**) are positive and significant, consistent with **Table 3-5**. Therefore, the empirical results are not different significantly.

Table 3-8 Logistic Regressions on Whether Firms Initiate Dividends within One Post-IPO Year

The table presents the results from estimating logistic regressions on a sample of IPOs during the period 1990-2010. The dependent variable equals to one if an IPO firm initiated dividend during the one post-IPO year, whichever is the earliest, and zero otherwise. The explanatory variables are as defined in Section 3.3.2.The *t*-statistics of the differences between control groups are presented as well. *, **, and ***denote significance at 10%, at 5% and at 1% respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
UNDERPRICING	-1.079***	-1.112***	-0.427	-1.468***	-0.863**	-1.226***	-0.469	-1.759***
	(0.000)	(0.000)	(0.140)	(0.000)	(0.025)	(0.005)	(0.133)	(0.000)
OPTION	-4.346**	-4.14**	-2.785	-3.361*	-1.764	-1.712	-2.623	-2.456*
	(0.031)	(0.030)	(0.142)	(0.055)	(0.139)	(0.114)	(0.128)	(0.099)
INSTITUTION	-0.615	-0.668			-0.894	-1.069*		
	(0.180)	(0.154)			(0.120)	(0.071)		
DIRECTOR			0.477				0.491	
			(0.122)				(0.119)	
VC STAKE		-1.161***		-0.737*		-1.298***		-0.709*
		(0.001)		(0.056)		(0.003)		(0.085)
VC-BACKED	-0.526***		-0.641***		-0.554***		-0.643***	
	(0.000)		(0.000)		(0.000)		(0.000)	
INSIDER LOCKUP	-0.415				-0.389			
	(0.123)				(0.239)			
AGGREGATE LOCKUP				-0.350				-0.535*
				(0.165)				(0.066)
LOCKUP DAYS			0.291				0.278	
			(0.196)				(0.227)	
LOCKUP CONSENT		-0.587***				-0.408**		
		(0.000)				(0.012)		
REPUTATION				14.867***				6.870
				(0.001)				(0.144)
AIM			-2.141***				-2.048***	
			(0.000)				(0.000)	
HITECH			-0.645***	-0.756***			-0.533***	-0.365**
			(0.000)	(0.000)			(0.001)	(0.026)
DP	4.216***	4.131***			3.060***	2.546***		
	(0.000)	(0.000)			(0.000)	(0.000)		

BUBBLE			-1.897***				-1.744***	
			(0.000)				(0.000)	
DUMMY2000S				-1.891***				-1.681***
				(0.000)				(0.000)
LNGP					0.728***			
					(0.000)			
LNASST						0.836***		
						(0.000)		
MTBV					-0.118***			-0.092**
					(0.005)			(0.022)
PROFIT					7.505***	7.065***		7.212***
					(0.000)	(0.000)		(0.000)
LEVERAGE					2.379***	0.669	1.344***	3.011***
					(0.000)	(0.227)	(0.008)	(0.000)
WCAP						-1.695***	-0.912***	
						(0.000)	(0.000)	
R&D					-0.369***			0.154
					(0.000)			(0.918)
CAPEXP					-1.225		-1.709	-1.577
					(0.234)		(0.103)	(0.135)
Constant	1.415***	4.814***	-0.590	0.953***	0.675**	2.191**	-0.478	0.895***
	(0.000)	(0.000)	(0.663)	(0.000)	(0.015)	(0.042)	(0.733)	(0.000)
N	1527	1527	1354	1527	1496	1495	1326	
Pseudo R^2	0.115	0.121	0.225	0.208	0.337	0.366	0.247	

Table 3-9 Logistic Regressions on Whether Firms Initiate Dividends post IPO

The table presents the results from estimating logistic regressions on the sample of IPOs during the period 1990-2010. The dependent variable equals to one if an IPO firm initiated dividend from admission date to December 31, 2011 or delisted date, whichever is the earliest, and zero otherwise. The explanatory variables are as defined in Section 3.3.2.The *t*-statistics of the differences between control groups are presented as well. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
UNDERPRICING	-0.428***	-0.444**	-0.167	-0.574***	-0.277	-0.332	-0.186	-0.709*
	(0.010)	(0.021)	(0.330)	(0.006)	(0.233)	(0.250)	(0.308)	(0.090)
OPTION	-0.888**	-1.09***	-0.754***	-0.697**	-0.293*	-0.437*	-0.761**	-0.529**
	(0.018)	(0.010)	(0.009)	(0.018)	(0.061)	(0.070)	(0.011)	(0.037)
INSTITUTION	-0.569	-0.487			-0.498	-0.448		
	(0.138)	(0.261)			(0.267)	(0.388)		
DIRECTOR			0.985***				1.023***	
			(0.000)				(0.000)	
VC STAKE		-1.177***		-0.883***		-1.154***		-0.678**
		(0.000)		(0.005)		(0.001)		(0.044)
VC-BACKED	-0.639***		-0.560***		-0.585***		-0.529***	
	(0.000)		(0.000)		(0.000)		(0.000)	
INSIDER LOCKUP	-0.266				-0.145			
	(0.234)				(0.597)			
AGGREGATE LOCKUP				-0.277				-0.222
				(0.155)				(0.378)
LOCKUP DAYS			0.240				0.215	
			(0.217)				(0.281)	
LOCKUP CONSENT		-0.490***				-0.294**		
		(0.000)				(0.039)		
REPUTATION				21.129***				13.872***
				(0.000)				(0.004)
AIM			-1.882***				-1.774***	
			(0.000)				(0.000)	
HITECH			-0.614***	-0.652***			-0.519***	-0.285**
			(0.000)	(0.000)			(0.000)	(0.050)
DP	3.382***	3.189***			2.125***	1.521***		
	(0.000)	(0.000)			(0.000)	(0.002)		
BUBBLE			-0.605***				-0.452**	
			(0.001)				(0.014)	
DUMMY2000S				-1.646***				-1.358***
				(0.000)				(0.000)

LNGP					0.577***			
					(0.000)			
LNASST						0.616***		
						(0.000)		
MTBV					-0.056*			-0.023
					(0.084)			(0.501)
PROFIT					6.125***	5.351***		5.852***
					(0.000)	(0.000)		(0.000)
LEVERAGE					2.444***	1.088**	1.936***	2.836***
					(0.000)	(0.043)	(0.000)	(0.000)
WCAP						-1.281***	-0.771***	
						(0.000)	(0.000)	
R&D					-2.285*			-0.805
					(0.081)			(0.516)
CAPEXP					-0.318		-1.017	-0.428
					(0.728)		(0.266)	(0.665)
Constant	1.719***	4.401***	-0.025	1.329***	1.126***	2.196**	0.060	1.142***
	(0.000)	(0.000)	(0.983)	(0.000)	(0.000)	(0.020)	(0.960)	(0.000)
N	1696	1527	1354	1696	1663	1495	1326	1496
Pseudo R^2	0.072	0.071	0.145	0.157	0.309	0.318	0.171	0.333

3.5.2 Robustness Test for Cox Proportional Hazard Model

I run the ordered logistic regressions to check the robustness of the results regarding the timing of initiating dividends (**Table 3-6**). When an event of interest has more than two categories, and when the values of each category have a meaningful sequential order, the ordinal model is an appropriate method of estimation. In this research, the 'ordered response' can be the timing of dividend initiation. In line with the classification used in the univariate analysis (section 3.4.1), IPO companies are categorised into three groups: the "Within 1 year" group, the "Between 2 and 4 years" group, and the "After 4 years" group. These dependent variables are given the value of 1, 2 and 3 for companies in three ordered groups respectively, and this enabled all observations in this sample to be ordered according to the timing of dividend initiation. The formula used is as follows:

$$\log(P_j) = \beta_j + \beta_i X_i \qquad (3-5)$$

X_i corresponds is the vector of control variables as defined in section 3.3.2, and 'i' is the number of control variables in each model. Notably, equation (3-5) regresses P_j $(j = 1, 2)$ on the predictor variables, and the number of odds is the number of categories minus one.

$$P_1 = \frac{Probability\ (Initiated\ within\ 1\ year\ after\ IPO)}{Probability\ (Initiated\ after\ 1st\ year\ after\ IPO)} \qquad (3-6)$$

$$P_2 = \frac{Probability\ (Initiated\ within\ 4\ years\ after\ IPO)}{Probability\ (Initiated\ from\ the\ 5th\ year\ after\ IPO)} \qquad (3-7)$$

The terms (β_j) are designed to play a similar role as the intercept term in binary logistic model. However, the coefficients β_i are the same for all odds. It's notable that the signs of estimated coefficients are expected to be opposite to the corresponding ones of logistic models, since a greater dependent variable represents a longer waiting period and a lower propensity to initiate. For example, profitable firms are more likely to initiate dividends, thus, the coefficient of profitability is positive in logistic models. By comparison, should profitable firms are more likely to initiate earlier, the coefficient of profitability tend to be negative in ordered regression models since the dependant variables are rated as a low number (1 versus 2 and 3, and 1 and 2 versus 3 for example).

Table 3-10 reports the results from estimating the ordered logistic regressions and shows that firm size (*LNGP* and *LNASST*), profitability (*PROFIT*) and catering proxy (*DP*) have significant and positive coefficients. Consistently, these variables show a negative relationship with the decision to initiate dividends in logistic analysis.

By comparison, venture capital involvement (*VC-BACKED*), AIM dummy (*AIM*), and dotcom bubble (*BUBBLE*), and 2000s dummy (*DUMMY2000S*) which are negatively related the decision to initiate dividends, affect positively the IPO firms decision to postpone dividend initiations. In addition, whereas insider lockup (*INSIDER LOCKUP*) does not show any predictive power in the logistic regressions, its coefficient is significantly positive in ordered regressions.

More predictor variables do not display a constant statistical significance in the regressions. For example, underpricing (*UNDERPR*) is significant at 10% level in models (1), (2), (4), (5) and (8), but insignificant in the remaining models. Similar results are observed for venture capital stake (*VC*), institutional ownership (*INSTITUTION*), managerial stock options (*OPTION*), aggregate lockup period (*LOCKUP CONSENT*), high-technology dummy (*HITECH*), long-term debt ratio (*LEVERAGE*), and ratio of working capital to total assets (*WCAP*). These results indicate that the explanatory power of these factors is sensitive to the inclusion of other control variables.

Furthermore, directors' ownership (*DIRECTOR*), aggregate locked-up shares (*AGGREGATE LOCKUP*), underwriter reputation (*REPUTATION*), market to book ratio (*MTBV*), R&D investment (*R&D*), and capital expenditure (*CAPEXP*) are not significant.

Table 3-10 Ordered Logistic Regressions on the Timing of Dividend Initiation

The table presents the results from estimating ordered logistic regressions on the sample of IPOs during the period 1990-2010. The dependent variable equals to 1 if the dividends are initiated within 1 year. The dependent variable equals to 2 if the dividends are initiated during 2- 4 years after IPO. The dependent variable equals to 3 if the dividends are initiated after 4 years of IPO. The explanatory variables are as defined in Section 3.3.2.The *t*-statistics of the differences between control groups are presented as well. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
UNDERPRICING	1.116***	1.231**	0.326	1.410***	0.630*	0.693	0.310	1.143
	(0.004)	(0.022)	(0.533)	(0.002)	(0.060)	(0.176)	(0.565)	(0.045)
DIRECTOR			0.018				-0.060	
			(0.964)				(0.893)	
VC STAKE		0.585		0.315		0.832*		0.557
		(0.172)		(0.452)		(0.075)		(0.232)
VC-BACKED	0.359**		0.404**		0.414**		0.419**	
	(0.017)		(0.042)		(0.013)		(0.034)	
INSTITUTION	1.110**	0.657			1.171*	1.030		
	(0.042)	(0.253)			(0.065)	(0.130)		
OPTION	0.56*	0.977***	0.939**	0.619	0.428	0.787**	0.965**	110.451
	(0.081)	(0.009)	(0.019)	(0.111)	(0.173)	(0.027)	(0.021)	(0.023)
INSIDER LOCKUP	0.758***				0.671**			
	(0.009)				(0.048)			
AGGREGATE LOCKUP				0.066				0.390
				(0.785)				(0.239)
LOCKUP DAYS			-0.300				-0.324	
			(0.311)				(0.349)	
LOCKUP CONSENT		0.363**				0.267		
		(0.046)				(0.186)		
REPUTATION				-1.211				-0.189
				(0.775)				(0.968)
AIM			1.370***				1.342***	
			(0.000)				(0.000)	
HITECH			0.336*	0.416**			0.279	0.430
			(0.065)	(0.023)			(0.219)	(0.016)
DP	-3.483***	-3.637***			-2.802***	-2.649***		
	(0.000)	(0.000)			(0.000)	(0.001)		

BUBBLE			2.585***				2.515***	
			(0.000)				(0.000)	
DUMMY2000S				1.122***				1.149
				(0.000)				(0.000)
LNGP					-0.534***			
					(0.002)			
LNASST						-0.665***		
						(0.000)		
MTBV					0.073			0.077
					(0.110)			(0.079)
PROFIT					-3.283***	-3.739***		-3.648
					(0.000)	(0.000)		(0.000
LEVERAGE					-0.569	-0.120	-0.366	-1.802
					(0.303)	(0.873)	(0.626)	(0.006)
WCAP						1.206***	0.504	
						(0.000)	(0.225)	
R&D					-0.048			-1.605
					(0.977)			(0.480)
CAPEXP					1.280		1.574	1.496
					(0.322)		(0.281)	(0.256)
CUT1	2.457	4.509	0.171	1.566	1.854	2.520	0.076	1.702
CUT2	4.163	6.128	2.236	3.304	3.748	4.427	2.159	3.566
N	799	684	540	799	791	677	537	678
χ^2	61.070	47.190	73.780	55.350	109.100	102.050	130.860	66.160
Pseudo R^2	0.055	0.059	0.155	0.067	0.111	0.143	0.160	0.135

3.5.3 Robustness Test for Logistic Panel Regression Model

Petersen (2009) notes that clustering in estimating panel regression models can result in biased standard errors. To examine the robustness of the estimates from logistic panel regression, I use the Linear Probability Models (LPM) with Newey-West, Generalized Least-Squares (GLS) and Fama-MacBeth[70] procedures. The formulation is as the following:

$$\boldsymbol{y_{it} = \beta_0 + \beta_i X_{it} + \varepsilon_{it}} \qquad (\mathbf{3-8})$$

In Equation (3-8), $\mathbf{y}_{it}$ takes on a value of 1 if a firm-year observation paid dividends and 0 otherwise. $\mathbf{X}_{it}$ represents the vector control variables as defined in section 3.3.2 for each sample year. $\boldsymbol{\varepsilon}_{it}$ is the error term.

Table 3-11 presents the results from estimating Model (5)-(8)[71]. In general, the results from LPM using different methods to correct t-statistics are consistent with the results from logistic panel regressions. In particular, the coefficients of *LNASST*, *MTBV*, *PROFIT* and *CAPEXP* are virtually the same under different methods, indicating the effects of these variables are robust. In addition, the estimation using GLS generates the most similar results as those resulted from unbalanced panel logistic models. However, there is some evidence that the OLS and the Newey-West methods appear to understate the standard errors[72] in line with Petersen (2009). For example, Table 3-9-A shows that the coefficient of R&D is significant in Newey-West regression but not significant at any level in the GLS regressions.

[70] According to Fama-MacBeth method (See Fama and MacBeth, 1973; Fama and French, 2001), the slope coefficients are estimated by averaging the coefficients from the annual models over the sample period.
[71] The estimates of dividend premium are not valid when using Fama-MacBeth because all firms have the same values of *DP* in a sample year.
[72] Petersen (2009) explains that the biased standard errors are likely when using OLS, White, Newey-West and Fama-MacBeth methods.

Table 3-11 Linear Probability Model basing on Unbalanced Panel Data

This table reports the results from estimating Linear Probability Model regressions (Equation (3-8)). Dependent variable takes on a value of 1 if a firm-year observation paid dividends and 0 otherwise. Explanatory variables are defined in section 3.3.2 for each sample year.

Variable	Newey-West	GLS	Fama-Macbeth
	Model (5)		
UNDERPRICING	-0.018***	-0.043**	-0.464
	(0.005)	(0.015)	(0.340)
VC-BACKED	-0.038***	-0.067***	-0.019
	(0.000)	(0.000)	(0.541)
INSTITUTION	-0.022	-0.071	-0.385
	(0.483)	(0.180)	(0.172)
OPTION	-0.476***	-0.899**	-5.689
	(0.000)	(0.021)	(0.258)
INSIDER LOCKUP	-0.026	-0.042	-0.004
	(0.164)	(0.163)	(0.959)
DP	0.051	0.037	(omitted)
	(0.145)	(0.288)	
LNASST	0.057***	0.099***	0.060**
	(0.000)	(0.000)	(0.017)
MTBV	0.005***	0.001	-0.081
	(0.000)	(0.579)	(0.197)
ROA	0.214***	0.110***	0.639**
	(0.000)	(0.000)	(0.044)
LEVERAGE	0.045	-0.036	-0.173
	(0.189)	(0.342)	(0.533)
R&D	-0.020*	-0.009	8.468
	(0.086)	(0.451)	(0.330)
CAPEXP	0.333***	0.394***	0.231
	(0.000)	(0.000)	(0.155)
Constant	0.109***	0.158***	0.293**
	(0.000)	(0.000)	(0.060)
N	6303	6303	6303
R^2		0.089	0.216
F	70.730	452.330	1.960
	***	***	*
	Model (6)		
UNDERPRICING	-0.021***	-0.047	0.238
	(0.001)	(0.011)	(0.351)
VC STAKE	-0.072***	-0.146***	-0.204
	(0.001)	(0.000)	(0.229)
INSTITUTION	0.013	-0.042	-0.145
	(0.689)	(0.475)	(0.267)
OPTION	-0.378***	-0.766*	-9.847
	(0.000)	(0.057)	(0.191)
LOCKUP CONSENT	-0.001	-0.025	0.024
	(0.898)	(0.124)	(0.480)
DP	0.011	0.027	(omitted)
	(0.754)	(0.445)	
LNASST	0.057***	0.100***	0.089**
	(0.000)	(0.000)	(0.027)
ROA	0.194***	0.094***	0.275***
	(0.000)	(0.000)	(0.003)
LEVERAGE	0.060	-0.015	-0.060
	(0.102)	(0.701)	(0.587)
WCAP	-0.047***	-0.022	0.084
	(0.000)	(0.128)	(0.360)
Constant	0.112	0.292***	-0.042
	(0.068)	(0.005)	(0.868)
N	5735	5735	5735
R^2		0.082	0.210
F	71.450	365.360	2.740
	***	***	**
	Model (7)		
UNDERPRING	-0.023***	-0.046**	-0.026
	(0.001)	(0.023)	(0.384)

DIRECTOR	0.050***	0.048	0.070**
	(0.007)	(0.166)	(0.040)
VC-BACKED	-0.031***	-0.060***	-0.023**
	(0.000)	(0.000)	(0.035)
OPTION	-0.423***	-0.900**	-5.502*
	(0.000)	(0.043)	(0.090)
LOCKUP DAYS	0.020	0.031	-0.025
	(0.160)	(0.198)	(0.160)
AIM	-0.155***	-0.264***	-0.127***
	(0.000)	(0.000)	(0.000)
HITECH	-0.075***	-0.097***	-0.090***
	(0.000)	(0.000)	(0.005)
BUBBLE	-0.033**	-0.020	(omitted)
	(0.023)	(0.134)	
LEVERAGE	0.129***	0.014	0.108**
	(0.000)	(0.725)	(0.040)
WCAP	-0.012	-0.002	-0.011
	(0.211)	(0.902)	(0.468)
CAPEXP	0.229***	0.238***	0.144*
	(0.001)	(0.000)	(0.074)
Constant	0.125	0.252	0.378**
	(0.136)	(0.089)	(0.020)
N	5532	5532	5532
R^2		0.065	0.085
F	26.350	302.500	5.820
	***	***	***
	Model (8)		
UNDERPRICING	-0.016**	-0.041**	-1.078
	(0.017)	(0.015)	(0.294)
VC STAKE	-0.034	-0.086**	0.660
	(0.103)	(0.013)	(0.303)
OPTION	-0.528***	-1.127***	-9.385
	(0.002)	(0.002)	(0.140)
AGGREGATE LOCKUP	-0.002	-0.057	-0.057
	(0.901)	(0.013)	(0.415)
REPUTATION	0.938***	1.323***	2.875
	(0.009)	(0.001)	(0.310)
HITECH	-0.038***	-0.052***	-0.131
	(0.000)	(0.000)	(0.460)
DUMMY2000S	-0.192***	-0.135***	(omitted)
	(0.000)	(0.000)	
MTBV	-0.002*	-0.007***	0.418
	(0.059)	(0.000)	(0.360)
PROFIT	0.201***	0.151***	-0.175
	(0.000)	(0.000)	(0.744)
LEVERAGE	0.089***	0.036	-1.438
	(0.010)	(0.329)	(0.359)
R&D	-0.006	-0.001	-3.643
	(0.024)	(0.920)	(0.331)
CAPEXP	0.229***	0.353***	1.149
	(0.001)	(0.000)	(0.373)
Constant	0.312***	0.370***	-0.221
	(0.000)	(0.000)	(0.667)
N	6303	6303	6303
R^2	0.147	0.133	0.218
F	81.550	507.180	0.970
	***	***	

3.6 Findings and Conclusions

In this chapter, I use various methodologies to assess the impact of IPO characteristics on the decision to initiate dividends in the post-IPO period. I develop various hypotheses by combining the various determinants of dividends with the IPO theories. In identifying the theoretical links and interpreting the observed empirical results, I focus on the signaling, agency costs, life cycle and catering theories of dividends. I hand-collect all the data from prospectuses, including offer price to calculate underpricing, lockups, institutional ownership, management holdings, venture capitalists and managerial stock option. In addition, I use IPOs fundamental variables such as firm size, leverage, growth opportunities, R&D expenditure, capital expenditures and working capital.

I use univariate analysis, cross-sectional logit, and unbalanced logistic panel regressions to examine the indicator factors that distinguish IPOs with dividend initiation from those without dividend initiation. Importantly, measures are taken to deal with the time series correlation for panel data analysis. In addition, by using Cox Proportional Hazard (CPH) models, I investigate the timing of dividend initiations. To test for the robustness of my results, I use cross-sectional ordinal logit models and linear probability models (LPM). The overall results (as summarized in **Table 3-12**) illustrate that those indicator factors causing greater (smaller) incidence to initiate dividends will be associated with shorter (longer) time intervals between IPO and dividend initiation. The main findings can be generalized as following:

3.6.1 Asymmetric Information and Signaling

My results show that underpricing (*UNDERPRICING*) is negatively associated with the probability of dividend initiation and the early dividend initiation. This finding coincides with Michaely and Shaw (1994) who find underpriced IPOs tend to pay low dividends. The negative effect of underpricing on dividend initiation cannot be explained by Allen and Faulhaber’s (1989) IPO signaling high-quality IPO firms arrange low offer prices so that they are able to interpret future high dividends more favorably. Instead, this result is in line with the implication of Dividend Discount Model and Rock’s “winner’s curse” (1986). Specifically, paying no dividends or postponing the dividend payment means the information asymmetry is substantial, so the issuing firms would intentionally lower the offer price to compensate the uninformed investors. The alternative argument can be that underpriced IPO firms usually confront *ex ante* uncertainty which impede the dividend payments.

Both managerial ownership (*DIRECTOR*) and underwriter reputation (*REPUTATION*) are positively associated with IPOs' propensity to pay dividends, in support of dividend signaling theory. Informed managers of high-quality IPOs tend to retain a large fraction of shares (Pyle, 1977; Ross, 1977) and wish signal information by distributing dividends. Similarly, prestigious underwriters provide certification for "good" firms (Booth and Smith, 1986) who have strong motivation and capability to initiate dividends.

By contrast, VC backing (*VC STAKE*, *VC-BACKED*) and the length of full lock-up restriction period (*LOCKUP CONSENT*) are found to be the factors with negative effect on the inclination to pay dividends. The alternative variables proxy for lock-ups such as *INSIDER LOCKUP*, *AGGREGATE LOCKUP* and *LOCKUP DAYS* also show negative effect on the initiation propensity, but these results are not statistically solid. In information equilibrium, these results suggest that IPOs substitute their dividends for these factors as signaling device since these factors are shown in previous studies to mitigate the level of information asymmetries (Booth and Smith, 1986; Megginson and Weiss, 1991; Brav and Gompers, 2003; Espenlaub et al., 2001; Courteau, 1995; Brau et al., 2005). For example, we may argue that the information asymmetry would become more serious if no dividends are paid out and in such case the more restrictive lockup provisions will be required. Moreover, I find no evidence the institutional ownership has significant influence on the decision to initiate dividends of IPOs.

3.6.2 Agency Costs

The findings that the propensity of paying dividends is negatively influenced by the full lockup restriction period (*LOCKUP CONSENT*), VC backing (*VC STAKE*; *VC-BACKED*) and managerial stock option (*OPTION*) provide support for the substitute assumption of agency costs which suggests that weak corporate governance leads to higher demand of dividend payouts (Rozeff, 1982; Jensen, 1986; Smith and Watts, 1992; Gaver and Gaver, 1993; LaPorta et al., 2000; Officer, 2006). For example, IPOs who define longer lockup restriction periods (*LOCKUP CONSENT*) find it less necessary to reduce agency costs by paying dividends, because the lockup agreements bond the interests of directors and investors (Brav and Gompers, 2003). These results are in accordance with results from some previous studies. Jain et al. (2009) find that VC backing (*VC STAKE; VC-BACKED*) negatively affects the likelihood to initiate dividends. The documented negative effect of managerial options (*OPTION*) is consistent with findings reported by Smith and Watts (1992), Yermack (1995), Weisbenner (2000), and Fenn and Liang (2001). And, the finding in respect of managerial options is consistent with the argument of Lambert, Lanen and Larcker (1989) who suggest that executive stock options motivate managers to reduce dividends because they are not “dividend protected.

By contrast, the results regarding managerial ownership (*DIRECTOR*) and leverage (*LEVERAGE*) lend support for the complement assumption of agency costs which suggests that strong corporate governance accompanies higher dividend payment (LaPorta et al., 2000; Fenn and Liang, 2001; Grinstein and Michaely, 2005). Both proxy variables are positively associated with the inclination of IPOs.

My results also show the strong evidence that IPOs’ preference to initiate dividends is adversely influenced by the growth opportunities (*MTBV*) and technology intensity (*HITECH*). And companies issued on AIM which is defined as a high growth market are more reluctant to initiate dividends relative to those issued on main market. These results are consistent with free cash flow hypothesis (Jensen, 1986).

3.6.3 Life-Cycle

The findings that VC backing and lockup agreement have negative effect on the dividend policy of IPOs are consistent with the suggestion of life cycle theory in which mature firms instead of young firms are in a better position to pay dividends. Previous literature (Lerner, 1994; Gompers, 1995; Bergemann and Hege, 1998; Gompers and Lerner, 2000, 2003; Lee and Wahal, 2004; Cumming and Johan, 2008 and Krishnan et al., 2011) suggests that venture capitalists prefer to invest into early-stage companies that are small, young and technology-focused. Likewise, Brav and Gompers (2000, 2003) find that young firms are associated with longer lockup periods. The other explanation for the negative effect of VC backing can be that venture capitalists prefer short-term capital gains to long-term future dividends stream (Lerner, 1994 and Field and Hanka, 2001).

IPO firms with larger size (*SIZE*), higher profitability (*ROA*) and lower growth opportunities (*MTBV*) are found to be more likely to initiate dividends and pay earlier, in line with previous studies (Fama and French, 2001; Bulan, et al., 2007; Denis and Osobov, 2008; Eije and Megginson, 2008; Ferris et al., 2009 and Kale et al., 2011). In addition, the findings that IPOs from high technological industry and AIM are reluctant to initiate dividend coincide with life cycle hypothesis since these firms are commonly considered as young and high growth. In addition, the positive signs of leverage (*LEVERAGE*) shown in results are consistent with life cycle hypothesis because high leverage may simply indicate that firms are in mature stage (Eije and Megginson, 2008).However, the negative signs, which are expected under lifecycle hypothesis, for R&D Expenditure (*R&D*) and Capital Expenditures (*CAPEXP*) can only be found in univariate analysis.

3.6.4 Catering

Finally, the tests show that the IPOs issued in the years when markets put a price premium on dividend paying payers (*DP*) are more likely to become dividend payers and tend to initiate dividends earlier, consistent with the implication of catering theory (Baker and Wurgler, 2004).

To sum up, common firm characteristics and IPO-related factors can affect dividend decisions of IPOs through miscellaneous mechanisms of dividends. The most homogeneous results are associated with the life cycle theory and catering theories. There are also some empirical results in support of signaling and agency theory. The empirical tests do not negate any of the major dividend theories. For example, the results about underpricing, institutional ownership or lock-ups contradict the predictions of signaling theory. But the signs of the alternative proxy variables, such as directors' ownership and underwriter reputation, are in the direction as predicted by signaling theory.

An issue worthy of discussion is that, in some cases, different theories do lead to the same predictions for some proxy variables. For example, both signaling theory and the complement assumption of agency costs predict a positive relation between managerial ownership and the likelihood of paying dividends. For such case, finding support for particular theories can be difficult. This may suggests that, in some cases, the predictions suggested by different theories do not mutually exclude.

Table 3-12 Summaries of Results

Main Hypotheses	Indicator Factors	Proxy Variables	Exp Sign	Univariate	Logit	CPH	Panel Logit	Ordinal Logit	LPM+GLS	
Signaling / Certification	Underpricing	*UNDERPRICING*	+	-	-	-	-	No	-	
	Managerial Ownership	*DIRECTOR*	+	+	+	+	+	No	No	√
	Lock-ups	*INSIDER LOCKUP*	+	No	No	No	No	-	-	
		AGGREGATE LOCKUP	+	-	No	No	No	No		
		LOCKUP DAYS	+	No	No	No	No	No	No	
		LOCKUP CONSENT	+	-	-	-	No	No	No	
	Institutional Ownership	*INSTITUTION*	+	No	No	No	No	No	No	
	VC Backing	*VC STAKE*	+	-	-	-	-	No	-	
		VC-BACKED	+		-	-	-	-	-	
	Underwriter Reputation	*REPUTATION*	+	+	+	+		No		√
Bonding/Monitoring & Substitute	Managerial Ownership	*DIRECTOR*	-	+	+	+	+	No	No	
	Lock-ups	*INSIDER LOCKUP*	-	No	No	No	No	-	-	
		AGGREGATE LOCKUP	-	-	No	No		No		
		LOCKUP DAYS	-	No	No	No	No	No	No	
		LOCKUP CONSENT	-	-	-	-	No	No	No	√
	Institutional Ownership	*INSTITUTION*	-	No	No	No	No	No	No	
	VC Backing	*VC STAKE*	-	-	-	-	-	No	-	√
		VC-BACKED	-		-	-	-	-	-	√
	Managerial Stock Option	*OPTION*	-	-	-	-	-	-	-	√
	Leverage	*LEVERAGE*	-	+	+	+	No	No	No	
	Managerial Ownership	*DIRECTOR*	+	+	+	+	+	No	No	√
	Lock-ups	*INSIDER LOCKUP*	+	No	No	No	No	-	-	
		AGGREGATE LOCKUP	+	-	No	No		No		
		LOCKUP DAYS	+	No	No	No	No	No	No	
		LOCKUP CONSENT	+	-	-	-	No	No	No	

Bonding/Monitoring & Complement	Institutional Ownership	*INSTITUTION*	+	No	No	No	No	No	No	
	VC Backing	*VC*	+	-	-	-	-	No	-	
		VC-BACKED	+		-	-	-	-	-	
	Managerial Stock Option	*OPTION*	+	-	-	-	-	-	-	
	Leverage	*LEVERAGE*	+	+	+	+	No	No	No	√
Agency costs of free cash flow	R&D Expenditure	*R&D*	-	-	No	No	No	No	No	
	Capital Expenditures	*CAPEXP*	-	-	No	No	-	No	-	
	Growth Opportunity	*MTBV*	-	-	No	-	-	No	-	√
	Technology Intensity	*HITECH*	-	-	-	-	-	No	-	√
	AIM	*AIM*	-	-	-	-	-	-	-	√
Life cycle	VC Backing	*VC*	-	-	-	-	-	n	-	√
		VC-BACKED	-		-	-	-	-	-	√
	Lock-ups	*INSIDER LOCKUP*	-	No	No	No	No	-	-	
		AGGREGATE LOCKUP	-	-	No	No		No		
		LOCKUP DAYS	-	No	No	No	No	No	No	
		LOCKUP CONSENT	-	-	-	-	No	No	No	√
	Firm Size	*LNGP,LNASST*	+	+	+	+	+	+	+	√
	Growth Opportunity	*MTBV*	-	-	No	-	-	No	-	√
	Profitability	*PROFIT*	+	+	+	+	+	+	+	√
	R&D Expenditure	*R&D*	-	-	No	No	No	No	No	
	Capital Expenditures	*CAPEXP*	-	-	No	No	-	No	-	
	Leverage	*LEVERAGE*	+	+	+	+	No	No	No	√
	Technology Intensity	*HITECH*	-	-	-	-	-	No	-	√
	AIM	*AIM*	-	-	-	-	-	-	-	√
Catering	Dividend Premium	*DP*	+	+	+	+	No	+	No	√

* For definitions of proxy variables please refer to Section 3.3.2
* No denotes that there is no robust evidence found in tests
* √ denotes that the observed sign is generally in accordance with the excepted sign.

Appendix 3-1 Definition of Underwriter Reputation

There are two widely used measures of underwriter reputation in the empirical IPO literature. Previous studies also introduced other measures of underwriter reputation, such as the dummy variable of the global underwriters in Derrien and Kecskes (2007), and the dummy variable of Accepting Houses Committee (AHC) in Chambers and Dimson (2009). Carter and Manaster (1990) measure reputation using underwriters' relative positions in the 'tombstone' advertisements in the financial press that follow the completion of an IPO. Megginson and Weiss (1991) use the relative market share of the underwriter, which is comparably simple, as it requires less effort to construct, and it is practical and its effectiveness has been confirmed. Carter, Dark, and Singh (1998) point out that the proxy used in their tests is correlated with Carter and Manaster (1990) and Megginson and Weiss (1991). In practice, the choice of measure results has not substantial impact on the results. In this paper, the market share of each underwriter is measured as the IPO proceeds of each underwriter generated from 1990 to 2010 divided by the total amount of IPO proceeds of all sample firms during the same period. When calculating, inflation is considered by employing consumer price index (CPI) supplied by IMF.

Chapter Four

Determinants of Dividend Decisions at IPO Stage

4.1 Introduction

When a firm wishes to trade on the London Stock Exchange, it is required by law to outline its proposed dividend policy in a publically available IPO prospectus. However, firms are free to define the terms and conditions under which they plan to execute dividend policy, and these terms and conditions often vary from one firm to another. For example, some firms provide guarantees of post-IPO dividend payments[73], whilst others do not[74]. The next question must be why do firms adopt specific dividend policies at the time of IPO?

Previous studies focus more on seasoned firms and analyze the determinants of and the market reaction to dividend initiations (Asquith and Mullins, 1983; Healy and Palepu, 1988; Christie, 1990). In this chapter, I contribute to the literature by assessing the determinants of dividend policy as stated in the IPO prospectuses. At the stage of preparing for IPO, such initial dividend policies are likely to be influenced by its pre-IPO financial status. Therefore, I analyze the pre-IPO accounting information disclosed in the prospectuses, profit and loss statements, balance sheets, and statements of cash flow for three consecutive pre-IPO years to assess whether dividend policy of IPOs is related to profitability, cash inflow from operating activities, capital expenditures,

[73] For example, Dawnay Day Carpathian plc, which is a firm listed on AIM on 26 July 2005, includes the following statements in its prospectus: 'it is the directors' intention that the company will operate a regular distribution policy subsequent to Admission, with an initial dividend yield intended to be 3 per cent, and expected to be paid to shareholders by 31 December 2005.'

[74] For example, Inditherm plc, which is a firm listed on AIM on 14 December 2001, includes the following statements in its prospectus, 'The Board anticipates that, following the Placing, cash resources will be retained for the development of the Group's business and will not be distributed for the foreseeable future.'

turnover ratio and debt ratio in the context of signaling, agency costs, and lifecycle theories. In addition, IPO prospectuses provide a considerable amount of information about IPO-related factors such as: corporate stock option schemes, investment bank sponsorship, lock-up agreements, stock ownership structure, high technological intensity and AIM dummy[75]. These variables have the potential to relate to dividend behaviors of IPOs in the context of the important dividend theories encompassing signaling, agency costs, life cycle and catering. Theoretical testable hypotheses for most of these variables in relation to dividends have been developed in Chapter 3 of this thesis. While Chapter 3 focuses on the aftermarket dividend behavior of IPOs, this chapter investigates how the financial position of a firm during a three-year period pre-IPO and a variety of IPO-related factors affect the dividend decisions made by firms at the time of the IPO. Thus, this chapter will allow me to address further gaps in the literature. Moreover, using event study methodology this study examines the abnormal returns to dividend initiations in order to understand the information content of various dividend policies declared in IPO prospectuses. This study further contributes to literature by investigating the role that IPOs' dividend policies play in long-run aftermarket performance.

I collect data manually from the IPO prospectuses. My sample includes 932 IPO firms listed on the London Stock Exchange from 1996 to 2010, classified into four sub-groups according to their attitude toward dividend payments, or their willingness to pay dividends at the time of IPO. The issuing firms that declared their clear intention[76] to pay dividend in offering prospectuses are grouped into Type1, whilst those that had no intention of paying dividends and/or that did not release effective information about their dividend policy are grouped into Type4, with Type2 and Type3 firms falling in between. Type2 firms pursue an active or progressive[77] dividend policy, but relative to Type1 firms, they are relatively more likely to default dividend payments if their financial status cannot reach the expected standard. Type3 firms state that they will not declare a dividend in short or medium term, but usually they state that they will continue to review the appropriateness of its dividend policy. One may argue that Type3 firms resemble Type4 firms in terms of their style of dividend policy. Therefore, I track

[75] The Alternative Investment Market (AIM) is a market for small and young IPOs, which do not necessarily satisfy the requirements imposed on IPOs listed on the Main market, such as a minimum of three-year trading statements.
[76] Type1 firms inform the investors of the dividend level and/or the timing of the dividend payment.
[77] In IPO prospectuses, firms frequently use the phrase, 'progressive dividend policy' to indicate they that have positive and active attitude toward paying dividends. In this study, Type1 IPOs have more progressive dividend policies than Type2, Type3 and Type4 IPOs. Accordingly, Type1 and Type2 IPOs have more progressive dividend policies than Type3 and Type4 IPOs.

the post-IPO dividend patterns of IPOs in the sample and find that, in medium term (2-5years), Type3 IPOs have higher incidence of initiating dividends than Type4 IPOs. Further, to mitigate the potential issue of classification, I conduct robustness tests using a different setting of dependent variables. This classification enables us to analyze the key firm characteristics by using univariate comparisons, cross-sectional logistic regression models, and cross-sectional ordinal logistic regression models.

The main findings of this study are as follows. I find that the pre-IPO financial position of a firm appears to exert substantial influence on IPO dividend policy. IPOs with superior pre-IPO performance in profitability and cash inflow from operating activities tend to adopt active dividend policies such as Type1 or Type2. More specifically, IPOs that declare the detailed dividend level and/or the timing of the dividend payment (Type1) commonly exhibited higher profitability and continuous growth in earnings, and maintained positive level of earnings. This is consistent with Miller (1987), Healy and Palepus (1988), Benartzi, Michaely and Thaler (1997) and Koch and Sun (2004) who document that there is a strong link between a firm’s past earnings and changes in dividend policies. These findings are also consistent with the implication of Lintner (1956) model which suggests that dividend policy follows shifts in long-run, sustainable levels of earnings and managers are prudent to draw the very initial dividend policies so as to prevent from reversing dividend changes in the future. In this sense, the dividend policies presented in IPO prospectuses signals the past financial performance of firms.

Similar to the finding of Jain, Shekhar, and Torbey (2009), IPOs collaborating with prestigious underwriters are more inclined to adopt active dividend policies. In light of the IPO signaling explanation (Allen and Faulhaber, 1989), this result suggests that prestigious underwriters provide certification for high quality IPOs (Booth and Smith, 1986; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Carter and Manaster, 1990; Holland and Horton, 1993) who have the ability and demand to undertake high dividend payments. More importantly, I find that lower institutional ownership causes IPOs to choose relatively active dividend strategies when going public, consistent with Kale, Kini and Payne (2012) who suggest that IPOs are more likely to initiate dividends when the current level of institutional ownership is lower than what it should be so that they can attract the dividend-seeking institutional investors firms.

The results also show that the active dividend policies in offering prospectuses are negatively related to the length of full lockup restriction period and venture capital participation. Since these factors are shown in previous studies to mitigate the level of information asymmetries (e.g., Espenlaub, Goergen and Khurshed, 2001; Brav and Gompers, 2003; Booth and Smith, 1986; Megginson and Weiss, 1991), these results imply that IPOs substitute dividends for these factors as signaling devices. However, contrary to the predictions of IPO signaling theory (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989), the effect of managerial ownership on IPOs' dividend policy is not significant. The results overall suggest that dividends serve as a role in information equilibrium at IPO stage.

Consistent with the substitute assumption of agency costs which suggests that enhanced corporate governance leads to lower demand of dividend payouts (Rozeff, 1982; Jensen, 1986; Smith and Watts, 1992; Gaver and Gaver, 1993; LaPorta et al., 2000; Officer, 2006), the decision of choosing active dividend policy is negatively influenced by the length of full lockup restriction period since Brav and Gompers (2003) argue that lockup agreements can align the interests of managers and investors. Similarly, consistent with the substitute assumption of agency costs, IPOs with VC backing, high institutional ownership or high level of managerial stock options tend to be relatively conservative in stating dividend policy in prospectuses. Previous literature suggests that these factors can bind the interests of insiders and outsiders (e.g. Fenn and Liang, 2001) or enhance the monitoring (e.g. Megginson and Weiss, 1991). On the other hand, these revealed relations challenge the complement assumption of agency costs which suggests that dividend payment is a complement for corporate governance (LaPorta et al., 2000; Grinstein and Michaely, 2005).

In addition, consistent with the predictions of free cash flow hypothesis (Jensen, 1986) and residual rationale (Miller and Modigliani, 1961; DeAngelo and DeAngelo, 2006), IPOs with higher cash flows and lower capital expenditures tend to be active in making dividend policies when going public. On the contrary, IPOs in high technological sectors or IPOs issued on AIM are relatively conservative for their dividend policies since they are normally growing rapidly and need capital injection. Higher asset turnover ratios lead firms to choose more active initial dividend policies when they go public, consistent with the residual theory of dividends.

My results are primarily consistent with the predictions of the lifecycle theory. Previous studies suggest that venture capitalists prefer to invest into early-stage companies that are small, young and technology-focused (see Lerner, 1994; Gompers, 1995; Bergemann and Hege, 1998; Lee and Wahal, 2004; Krishnan et al., 2011). Therefore, the finding that the venture-capital backed IPOs tend to declare relatively conservative dividend policies in prospectuses is in line with the prediction of lifecycle theory. Moreover, this finding is in line with the argument that venture capitalists tend to pursue capital gains from short-term investments rather than long-term dividend streams (Lerner, 1994; Field and Hanka, 2001). In addition, Brav and Gompers (2003) and Espenlaub et al. (2001) suggest that the degree of a firm's maturity has a negative relation with the severity of lock-up agreements. Thus, the finding that firms with longer full lockup period are reluctant to be active in dividend decision making is in line with the life cycle theory as well. Moreover, the other consistent evidence for lifecycle theory is that larger IPOs are more progressive in choosing dividend policies at the time of IPO since larger firms are considered to be more mature (Fama and French, 2001, Deshmukh, 2003).

Also, the tests show that the evidence on catering theory is mixed as the coefficients of dividend premium are insignificant in binary logistic regressions, but significant in some of ordinal logistic regressions. Dividend policies at IPO stage are sensitive to the periods of time. IPOs issued in the 'internet bubble' period opt for relatively conservative dividend strategies. IPOs issued in 2000s are less likely to adopt active dividend policies than those issued in the 1990s.

Furhtermore, I find that Type1 IPOs have lower cumulative abnormal returns (CARs) to dividend initiation announcements compared with non-Type1 counterparts, supporting the conjecture that Type1 IPOs release sufficient information through dividend policies declared in offering prospectuses and therefore their formal dividend initiations fail to shock the market. While TYPE2 has the significant CARs over the major event windows, neither TYPE3 nor TYPE4 has the statistically significant CARs. A possible explanation is that investors only regard the dividend disbursement made by low technology-focused companies (Type1 and Type2)[78] as good news. I find that dividend-paying companies outperform non-dividend paying counterparts during three post-IPO years, indicating that non-dividend initiating IPOs rather than dividend-initiating ones account for the decline in long-run underperformance. The additional remarkable finding is that Type1 IPOs do not exhibit declining long-run performance.

[78] The statistics in the following cotext shows that Type3 and Type4 companies are more likely to belong to high technology industries relative to Type1 and Type2 counterparts.

The cumulative average market-adjusted returns for Type1 IPOs remain positive during the 36 holding months after IPO. Long-run performance descends orderly from Type1 to Type4 in the most of observed post-IPO months. This finding supports the argument that the dividend policies stated in prospectuses communicate the information, and thus reduce the possibilities that outside investors are overoptimistic over the prospect of the invested companies and that managers overstate the pre-IPO financial data at IPO stage.

The empirical tests overall support lifecycle theory, substitution assumption of agency theory, free cash flow hypothesis, while the evidence on signaling and catering theory is relatively mixed. The information content of dividend policies released at the time of IPO has materially effects on the abnormal returns to dividend initiation announcements and the long-run aftermarket excess returns. The rest of this paper is organized as follows. Section 4.2 reviews the literature and formulates a series of testable hypotheses to be used as a framework for conducting an empirical analysis. Section 4.3 details the sample and the variables used. Section 4.4 presents the empirical results. The discussion and conclusions are presented in Section 4.5.

4.2 Literature Background and Hypotheses

In this section, to investigate why firms adopt certain dividend policies at IPO stage, I develop the testable hypotheses by focusing the main dividend theories: signaling, agency conflicts, life cycle and catering. Previous chapter of this thesis outlines a series of hypotheses linking key IPO characteristics and IPO-related factors to dividend behaviors, namely the decision to initiate dividends and the timing of dividend initiation. This chapter retains some fundamental variables discussed in the previous chapter (see **Table 3-1**), but I focus more on the financial characteristics of the sample firms before their IPO. For example, in line with the arguments developed in the previous chapter, I expect high technological firms to state relatively conservative dividend policies in offering prospectuses at the time of their IPO. I, therefore, set out the testable hypotheses as follows.

4.2.1 Asymmetric Information and Signaling

Lintner’s (1956) field investigation stressed that companies that pay dividends set their long-term target payout ratios, and they are reluctant to make any changes in dividends that they cannot maintain in the future. This suggests that firms initiate dividends only when the management believes that long-term sustainable earnings are available and that dividends carry information content actually. Relaxing a condition of the complete market described by Miller and Modigliani's (1961), Bhattacharya (1979), Miller and Rock (1985), and John and Williams (1985) establish the signaling theory suggesting that dividends signal the intrinsic value of dividends when information asymmetry exists. However, the evidence relating to whether dividends convey information on the future earnings is mixed[79]. In this section, in the context of asymmetric information and signaling theory, dividend behavior of IPOs is linked to a series of IPO-related proxy variables including underpricing, directors' stock ownership, lock-up agreements, institutional ownership, and venture capital participation and underwriter reputation.

(1) Pre-IPO Profitability

Benartzi, Michaely, and Thaler (1997) point out that, according to Lintner (1956), changes in dividends depend on current and past earnings. Miller (1987) proposes that dividends proxy for 'lagging' earnings rather than 'leading' earnings. Healy and Palepus (1988) find that earnings increase both before and after dividends initiation. Garrett and Priestley (2000) develop a model and provide evidence to show that dividends convey information about positive changes in current permanent earnings rather than in future permanent earnings as the information of future earnings growth is captured by the changes in lagged stock price. Koch and Sun (2004) provide empirical results showing that dividend increases are overwhelmingly preceded by earnings increases, but, by contrast, the chance that dividend decreases follow earning increases is very low. Therefore, I conjecture that IPO firms with a better pre-IPO financial position in earnings tend to state relatively active[80] dividend policies in their IPO prospectuses. On the contrary, less profitable firms are more likely to declare conservative[81] dividend policies.

H1: *Higher profitability level prior to IPO is positively associated with more active dividend policies specified in prospectuses.*

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[79] The evidence supporting the positive relation between changes in dividends and future earnings can be found in Brickley (1983), Healy and Palepu (1988), and Aharony and Dotan (1994), Guay and Harford (2000), Jagannathan et al. (2000), Nissim and Ziv (2001). On the contrary, Watts (1973), DeAngelo, DeAngelo, and Skinner (1996), Benartzi, Michaely, and Thaler (1997), Garrett and Priestley (2000), Grullon, Michaely, and Swaminathan (2002) and Grullon, Michaely, Thaler, and Benartzi (2005) do not find evidence to support that dividends signal future earnings.

[80] Active (progressive, advance) dividend policy will be defined and interpreted in detail in section 4.3.1.

[81] Conservative dividend policy is a contrast term to active dividend policy.

(2) Managerial Ownership

Leland and Pyle (1977), Ross (1977), Allen and Faulhaber (1989) and Grinblatt and Hwang (1989) suggest that high quality IPO firms convey inside information by retaining greater fraction of shares. Therefore, according to dividend signaling principle, IPO firms with higher insider ownership are more likely to pay costly dividends. This leads to the following testable hypothesis:

H2: *Higher managerial ownership is associated with more active dividend policies specified in prospectuses.*

(3) Lockup Agreement

A typical lock-up agreement provides that directors, related parties and any relevant employees undertake to give up the right to sell a specific percentage of their shareholdings for a specified period after they are issued. Brav and Gompers (2000) and Espenlaub et al. (2001) elaborate the role of lock-up agreements [82] in information equilibrium, and Courteau (1995) and Brau, Lambson and McQueen (2005) argue that high quality firms tend to accept severe lock-up agreements to communicate information to new investors. In the spirit of the signal hypothesis, firms that accept severer lock-up restriction will be attached with greater chance to pay dividends. But there exists a possibility that lock-up agreements are negatively related the propensity of dividend initiation since one may argue that the information asymmetry would become more serious if no dividends are paid out and thus the more restrictive lock-up provisions will be required. Prior studies do not provide direct empirical evidence relating dividend policy to the lock-up covenant except Brav and Gompers (2003) who provide the empirical result, which is inconsistent with the signaling explanation. The testable hypotheses below can be suggested:

H3: *IPOs with severer lockup agreement are associated with more active dividend policies specified in prospectuses.*

(4) Institutional Ownership

Allen, Bernardo, and Welch (2000) suggest that high quality firms are willing to attract

[82] Brav and Gompers (2000) suggest that lock-up agreements may prevent insiders from exploiting private benefit by using their superior information since lock-up agreements give time for outsiders to absorb the private information of existing shareholders. Espenlaub, Goergen and Khurshed (2001) argue that issuing firms with information asymmetry will involve lock-up agreements. Their argument is based on two findings: (1) High-tech firms that have greater information asymmetry are more likely to choose absolute expiry dates than other firms. According to their idea, absolute expiry dates mean less uncertainty and more transparency than flexible expiry dates. (2) Sponsor reputation can be a signaling substitute to lock-up agreements.

informed institutional investors who can provide certification of firm quality at expense of tax cost of dividends for purpose of signaling firm value. Based on Allen et al. (2000), Kale et al. (2012) hypothesize that firms are more likely to initiate dividends when the current level of institutional ownership is lower than what it should be. Correspondingly, if the current level of institutional ownership is high enough to demonstrate the contemporary intrinsic value, the incidence of dividend initiation should be lower and the initiation of dividends should be delayed. This leads to the testable hypothesis:

H4: *Lower Institutional ownership is associated with more active dividend policies specified in prospectuses.*

(5) Venture Capital Backing

Booth and Smith (1986) and Megginson and Weiss (1991) explicitly theorise that venture capitalists have the potential to certify the quality of IPOs because of their superior knowledge on the firms that they back. A positive relation between the long-term post-IPO performance and the venture capital involvement are supported by literature[83]. However, the evidence of the impact of venture capital investor on short-run performance appears to be controversial[84]. If the reputation of venture capitalists provides certification for IPOs, then the incidence of dividend initiation by IPOs is expected to increase with the involvement of venture capital investors according to the dividend signaling principle. Therefore, the testable hypothesis is:

H5: *The participation of venture capitalists is positively associated with more active dividend policies specified in prospectuses.*

(6) Underwriter Reputation

Booth and Smith (1986), Allen and Faulhaber (1989), Grinblatt and Hwang (1989), Carter and Manaster (1990) and Holland and Horton (1993) argue that a prestigious underwriter can serve as a certification of IPO quality, suggesting that better firms are more likely to collaborate with highly trusted financial sponsors. Many empirical investigations find that underwriter reputation can essentially influence the short-term and long-term IPO performance[85]. Allen and Faulhaber (1989) suggest that prestigious

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[83] Gompers and Lerner (1997), Espenlaub, Garrett and Mun (1999), Li and Masulis (2008) and Krishnan, Ivanov, Masulis and Singh (2011)

[84] (Barry et al.(1990), Megginson and Weiss (1991), Gompers and Lerner (1997), Espenlaub, Garrett and Mun (1999) and Habib and Ljungqvist (2001)

[85] Beatty and Ritter (1986), Titman and Trueman (1986), Maksimovic and Unal (1993), Carter and Manaster (1990), Carter, Dark and Singh, (1998), Gompers and Lerner (1998a), Espenlaub, Garrett and Mun (1999), Habib and Ljungqvist (2001) and Chambers

underwriters may prompt firms to initiate dividends since ‘good firms’ have ability and demand to undertake high dividend payments. As such, the following hypothesis can be put forward:

H6: *IPOs with prestigious underwriters have a greater propensity to specify more active dividend policies in prospectuses.*

4.2.2 Agency Costs

Jensen and Meckling (1976) explicate that the separation of ownership and control causes the conflicts of interest between managers and shareholders, which will in turn lead to the increase in agency costs and the loss of firm value. Agency-costs based dividend theories articulate that dividends expose the companies to external monitoring[86] (Rozeff, 1982; Easterbrook, 1984) and cut off the managers-controlled free cash flow which causes overinvestment (Jensen,1986). The corporate governance can essentially affect firm value in respect of agency conflicts. Jensen and Meckling (1976) and Richardson (2006) suggest that low quality of managerial governance will damage investor wealth due to overinvestment, especially when a great amount of free cash flow appears, and such argument is supported by Gompers et al. (2003), Harford, Mansi, and Maxwell (2008) and Masulis, Wang, and Xie (2009).

The link between dividend policy and corporate governance taken by entrepreneurial companies can be explained by the agency rationale. However, prior theoretical models are intricate and relevant empirical evidence is mixed. LaPorta et al. (2000) propose two basic models of agency costs. “Outcome model” suggests that the minority investors who are better protected by law have the preference and the sufficient power to require corporate insiders to pay dividends in order to reduce cash flow under managers’ control. “Substitute model” suggests that the companies with substantial moral hazard intentionally substitute dividends for the right of outside investors because they need to establish a reputation for future external financing. “Outcome model” predicts that superior investor protection will result in higher dividend payouts, while “substitute model” leads to an opposite prediction. The following part of this study will discuss whether dividends and corporate governance are substitutes or complementary in the context of agency theory by employing various proxy variables including managerial ownership, lock-up agreement, institutional

and Dimson (2009)

[86] Dividend payments compel companies to raise external capital from public market in the future.

ownership, venture capitalists backing, managerial stock options and financial accounting variables about free cash flow and growth opportunities.

(1) Pre-IPO Cash Flows and Capital Expenditures

Free cash flow hypothesis implies that agency problems are more likely for the firms with high cash inflows from and low capital expenditures. Lang and Litzenberger (1989) and Grullon, Michaely and Swaminathan (2002) find that companies with abundant free cash flows need to distribute dividends in order to solve overinvestment problems.

Therefore, the following hypothesis is:

H7: *According to agency theory, declaring relatively active dividend policies in IPO prospectuses is more likely for IPOs with higher cash flows and lower capital expenditures*.

(2) Pre-IPO leverage

Jensen (1986) argues that debt and dividend payment can be effective substitutes for reducing the agency costs of free cash flow because, relative to dividend payment, debt is a stronger commitment taken by entrepreneurs to pay out future cash flows since firms must face lawsuit in case of the default of interest and principal payment. Eije and Megginson (2008) and Renneboog and Trojanowski (2011) also forward the same argument. Crutchley and Hansen (1989), Jensen, Solberg and Zorn (1992) and Chen and Steiner (1999) find support for the substitution-monitoring effect between debt ratio and dividend payout.

H8: According to agency theory, *higher leverage level of firms in prior to IPO is positively associated with more active dividend policies specified in prospectuses.*

(3) Managerial Ownership

Rozeff (1982) argues that insider stock ownership aligns the interests of managers and shareholders; thereby the owner-managers are prompted to work for the maximisation of investors' wealth. His model assumes that dividend payout and directors' ownership can be viewed as substitutes in terms of mitigating agency conflicts and predicts that firms pay higher dividends when insiders hold a lower fraction of equity because dividend payments are helpful in reducing agency costs of monitoring/bonding. Hence, the implication of Rozeff (1982) is similar to that of "substitute model" given by LaPorta et al. (2000) which implies that weak corporate governance leads to higher demand of dividend payouts. Smith and Watts (1992) and Gaver and Gaver (1993) propose similar arguments. In the following context of this paper, such assumption is referred as “substitute assumption”. Empirical results in support of “substitute assumption” encompass Crutchley and Hansen (1989), Dempsey and Laber (1992), Eckbo and Verma (1994), Moh’d et al. (1995), Collins, Saxena, and Wansley (1996), Chen and Steiner (1999), Faccio, Lang and Young (2001).

Contrary to Rozeff (1982), Fenn and Liang (2001) suggest a complementary assumption in which the higher proportion of shares retained by managers will encourage more dividends to be distributed. Fenn and Liang (2001) claim that their logic is considerably similar to that of Berger, Ofek and Yermack (1997) who hypothesize that the inadequate corporate governance or serious managerial entrenchment will lead to less leverage because, in this occasion, managers have the nature to avoid firm risk and secure their personal wealth. Fenn and Liang (2001) also argue that owner-managers as stock investors will benefit from dividend disbursement which might act as a performance-enhancing incentive. Thus, the argument of Fenn and Liang (2001) is similar to “outcome model” of LaPorta et al. (2000) which implies that strong corporate governance leads to higher demand of dividend payouts. In the following context of this paper, such assumption is referred as “complement assumption”. However, Fenn and Liang (2001) and Kale et al. (2012) only provide mixed evidence to “complement assumption”.

H9: *According to complement assumption of agency costs, IPOs with higher managerial ownership have a greater propensity to specify more active dividend policies in prospectuses.*

(4) Lockup Agreement

Previous studies suggest that lock-up agreements possess the potential to deal with agency problem of corporations. Brav and Gompers (2003) argue that lock-up agreements are usually motivated by a commitment to align/bond the interests of managers and investors for overcoming the moral hazard problem. Moreover, as a result, agency costs are limited until the expiry of lock-ups. Espenlaub, Goergen and Khurshed (2001) assume that the presence of information asymmetry is more serious for firms from high-technology industry where investors undergo higher risk of being exploited and lock-up agreement can serve as corporate governance device. However, Brau, Lambson and Mcqueen (2005) argue that lock-up contracts only impose short-term restrictions on managers, whilst the monitoring ought to be an ongoing long-term process.

Prior research does not directly discuss the connection between dividend policy and lock-ups with respect of agency conflicts and relevant evidence is absent. Assuming lock-up agreement plays a role as a commitment to reduce the agency cost, there will be two possible predictions. First, the more restrictive the lock-up provisions[87] result in the less demand of paying dividends. This logic is actually similar to the substitute assumption (Rozeff, 1982; LaPorta et al., 2000). Second, restrictive lock-up provisions indicate that the firms suffer serious agency costs, so it is necessary to pay dividends as a complement measure to mitigate the conflicts of interest. This logic is actually similar to the complement assumption (LaPorta et al., 2000; Fenn and Liang, 2001; Grinstein and Michaely, 2005). To investigate the controversial arguments, I set up the following hypothesis.

H10: *According to substitution assumption of agency costs, IPOs with less restrictive Lock-up agreement tend to specify more active dividend policies in prospectuses.*

(5) Institutional ownership

Shleifer and Vishny (1986) and Zeckhauser and Pound (1990) and Gillan and Starks (2000) suggest that institutions help strengthen monitoring toward the firms that they invest. Grinstein and Michaely (2005) argue that larger institutional holdings will accompany higher payouts since the enhanced monitoring will lead to higher dividend payouts according to Jensen’s (1986) free cash flow hypothesis. In addition, Zeckhauser and Pound (1990), Eckbo and Verma (1994), and Farinha (2003) suggest that institutional investors with strong voting power may oblige companies to increases dividends in order to move away free cash flow from managers. Thus, the argument of Grinstein and Michaely (2005) reflects the essence of “complement assumption” which implies that strong corporate governance leads to higher demand of dividend payouts and is supported by the results provided by Grinstein and Michaely (2005), Short, Zhang, and Keasey (2002) and Eckbo and Verma (1994). Thus, the testable hypothesis is as the following.

H11: IPOs with higher Institutional ownership tend to specify more active

[87] This means longer lock-up period or higher proportion of locked shares.

dividend policies in prospectuses.

(6) Venture Capital Backing

Previous studies have discussed the monitoring mechanism of venture capitalists involvement (Barry et al., 1990; Megginson and Weiss, 1991; Lee and Wahal, 2004; Chan, 1983; Bergloff, 1994; Hellmann and Puri, 2002 and Cumming and Johan, 2008). In a recent study, Krishnan et al. (2011) suggest that the monitoring offered by venture capitalists at IPO, along with VC's expertise in certain industry and advisory service, is one of reasons why the venture capitalists has the potential to certify the firms being backed by them. A gap in preceding literature is that dividend policy has not been directly related the participation of venture capitalists within the context of agency conflicts. Following the discussion in previous section, there may be two predictions. First, according to a line of argument that is similar to substitute assumption (Rozeff, 1982; LaPorta et al., 2000), venture capital investors are associated with smaller likelihood to pay dividends for IPO firms. Second, according to a line of argument which is similar to complement assumption (LaPorta et al., 2000; Fenn and Liang, 2001; Grinstein and Michaely, 2005), the prediction is contrary. To investigate the controversial arguments, I set up the following hypothesis.

H12: According to substitution assumption of agency costs, IPOs with higher venture capital backing tend to specify more active dividend policies in prospectuses.

(7) Stock Option

Fenn and Liang (2001) argue that stock option plan can be a component of corporate governance mechanisms. Stock option plan may facilitate the alignment of interests of managers and investors and reduce the agency costs. Then, again, there are two predictions on the relationship between stock options and dividends. Substitute assumption predicts that the use of stock option substitute for dividend payout to address agency problem. In contrast, complement assumption predicts that stock option plan and dividend payment are complements.

In addition, there is an indirect way to interpret the relationship between stock options and dividends in the context of agency theory. Stock option plan may be a motivation for managers to choose repurchases instead of dividends when paying out residual funds (Lambert, Lanen and Larcker, 1989; Bagwell and Shoven, 1988; Smith and Watts, 1992; Dittmar, 1997; Fenn and Liang, 2001). The results in previous studies support the notion that managers tend to substitute repurchases for dividends in the presence of stock options. Smith and Watts, (1992), Yermack (1995), Weisbenner (2000), and Fenn and Liang (2001) find that there is a negative relationship between executive stock options and dividend payouts. Jolls (1998), Fenn and Liang (2001), Aboody and Kasznik (2001) and Liljeblom and Pasternack (2002) document a positive relationship between repurchases and management stock options. In addition, Weisbenner, (2000) shows that repurchases will not adversely affect the exercise price of stock options. Given above discussion, I conjecture the following hypothesis.

H13: *According to substitution assumption of agency costs, IPOs with higher stock options tend to specify more active dividend policies in prospectuses.*

(8) Technology Focus and Choice of Exchange

In addition, firms that belong to high technology sectors are rapidly growing and in need of capital infusion (see Wu, Erkoc and Karabuk, 2005, for review) and thus undergo less agency costs of free cash flow when comparing with firms in conventional sectors. The propensity of paying dividends for high-technology firms is expected to be relatively low. Besides, AIM (the alternative investment market), launched in June of 1995, is an international market accommodating the growth and small firms. IPOs on AIM, in comparison to the main market, should display a greater reluctance to initiate dividends because of high growth. To sum up, above discussion leads to the following hypothesis.

H14: *IPOs in high technological sectors or IPOs issued on AIM do not tend to specify more active dividend policies in prospectuses.*

4.2.3 Life-cycle

Lifecycle theory (Fama and French, 2001; Grullon, Michaely and Swaminathan, 2002; DeAngelo and DeAngelo, 2006) suggests that young firms are not in a position to pay dividends because their limited initial resources must be reinvested into product development, marketing and organization. In contrast, mature firms that are more profitable and confront shrinking investment opportunities have stronger need to payout cash flows in the form of dividends.

(1) Pre-IPO Leverage

As Eije and Megginson (2008) argue that if high debt level is merely a characteristic for mature firms, then life cycle hypothesis suggests a positive relation between leverage and the dividend propensity. Jain et al. (2009) and Kale et al. (2012) observe that debt ratio of dividend initiating firms is on average significantly higher than that of non-dividend-initiating firms. It is possible that the substitution-monitoring effect between debt ratio and dividend payout will only be evident for established firms rather than the newly listed firms at time of IPO. Given above discussion, I conjecture the following hypothesis:

H15: According to lifecycle theory, *higher leverage level of firms in prior to IPO is positively associated with more active dividend policies specified in prospectuses*.

(2) Venture Capital Backing

A large body of the literature suggests that venture capitalists prefer to invest into early-stage companies that are small, young and technology-focused[88]. In addition, Lerner (1994) and Cumming and Johan (2008) suggest that venture capitalists prefer short-term investment opportunities and aim at achieving investment returns from capital gains[89]. Field and Hanka (2001) and Bradley and Roberts (2004) examine US lock-up agreements and find that venture capitalists often sell more aggressively than other shareholders do when lock-up agreements finally expire. According to life cycle hypothesis, these entrepreneurial companies backed by venture capitalists are less likely to return earnings to investors in form of cash dividend payouts since they are in dearth of funds to support their rapid expansion and. Thus, I construct the following testable hypothesis:

H16: *Venture capital participation is negatively associated with the possibility that IPOs specify active dividend policies in their prospectuses.*

(3) Lock-up Agreement

Brav and Gompers (2000, 2003) present evidence to support that young firms with a low ratio of book to market, a low cash flow margin, and low-quality underwriters usually adopt longer lock-up periods. So, this leads to the following hypothesis.

H17: *The severity of lock-up agreements is negatively related to the active*

[88] Lerner (1994), Gompers(1995),Bergemann and Hege (1998), Gompers and Lerner (2000, 2003), Lee and Wahal (2004) and Krishnan (2011)

[89] Cumming and MacIntosh (2003), McKaskill, Weaver, and Dickson (2004) and Parhankangas, Landstrom, and Smith (2005) express the similar viewpoint.

dividend policies specified in prospectuses.

(4) High technology intensity and AIM issuance

High technology firms need to retain residual capital to support R&D and marketing strategy, so they are often not in a position to pay dividends. Likewise, firms issued on AIM feature high growth rate and young age and thus they are more reluctant to pay dividends. In short, the testable hypothesis is as the following.

H18: *IPOs in high technological sectors or IPOs issued on AIM are less likely to specify active dividend policies in prospectuses.*

4.2.4 Catering

(1) Dividend Premium

Baker and Wurgler (2004a) argue that firms tend to initiate dividends when the market looks favorably on firms that pay dividends. Indeed, it could be argued that investors place a measure of sentiment on receiving dividend premiums[90], and this is the main reason, apart from making profits, why they prefer dividend-paying stocks to non-paying stocks. In spirit of catering theory of dividends, I have the following hypothesis.

H19: *IPOs are associated with larger (smaller) chance to specify an active dividend policy in prospectuses when dividend premium is high (low).*

4.3 Sample and Data

4.3.1 Sample Selection

The sample used in this study consists of IPOs listed on the main market and on the Alternative Investment Market (AIM) of the London Stock Exchange during 15 years period spanning from 1996 through to 2010. As same as in the previous chapter, I extracted information about the list of IPOs from the New Admissions Summary[91] of London Stock Exchange statistics. There are several exclusions taken in the process of sample selection. The sample excludes IPO firms that belong to the industries of finance, investment and the utilities. The sample excludes IPO firms without offering

[90] The measure of investor sentiment is dividend premium, which is measured as the difference between the logs of the average market-to-book ratios of payers and non-payers.

[91] New Admissions Summary contains data from June 27, 1995.

prospectuses available or without complete information required by the tests. It is necessary for all sample IPOs provide prospectuses containing complete historical accounting reports, including profit and loss statements, balance sheets, and statement of cash flow, for three consecutive fiscal years pre-IPO. These criteria lead to the final sample of 932 IPOs. In spite of the exclusion of a number of AIM IPOs without three years trading statements, the sample does not tilt only to firms listed on the main market. **Table 4-1** presents the annual distribution of my sample IPOs segmented into Main market and AIM.

Table 4-1 Statistics of Sample

IPO Year	All	Main Market	AIM
1996	108	57	51
1997	84	45	39
1998	59	36	23
1999	40	18	22
2000	107	51	56
2001	49	11	38
2002	40	9	31
2003	37	7	30
2004	114	16	98
2005	116	16	101
2006	92	10	82
2007	55	12	42
2008	3	2	1
2009	2	0	2
2010	26	8	18
Total	932	298	634

In prospectuses, the issuing firms do not use a standard format to state their post-IPO dividend policies. Thus, dividend policies stated in the prospectuses differed from firm to firm. For example, some IPOs present the clear time schedule of distributing dividends. In contrast, some IPOs state that they would not be paying dividends in the immediate future, or even provide limited information on dividend policies. In the following analysis, all sample IPOs are categorized into four types according to the propensity of firms to pay dividends as expressed in the offering prospectuses:

Type1: Firms have a definite intention to pay regular dividends after admission, and they inform the investors of the rough timing of the dividend payment and/or dividend levels. In some cases, they declare the exact dividend payout ratio, dividend yield or dividend coverage.

Example 1 *'The Directors do not intend to pay an interim dividend in respect of the half year ending 30 September 2004, but anticipate that a final dividend in respect of the financial year ending 31 March 2005 will be recommended representing two-thirds of a full year's dividend and which will be payable in July 2005. Thereafter, the Directors intend that interim and final dividends in respect of each financial year ending 31 March will be paid in November and July respectively in the approximate proportions of one-third and two-thirds of the total annual dividend.' (Pay-point PLC, issued on main market of* London Stock Exchange *in 2004)*

Type2: Firms express the intention to adopt a ***progressive*** dividend policy[92] depending on future operating performance and financial conditions, but the detailed dividend plans such as time schedule and dividend level are not displayed.

Example 2 *'The Directors intend to pursue a* **progressive** *dividend policy subject to the need to retain earnings for future investment and the availability of adequate distributable reserves.' (Tellings Golden Miller, issued on AIM of* London Stock Exchange *in 2003)*

Type3: Firms anticipate that profits and operating cash flows will be retained to support business growth ***in the short or medium term*** rather than be paid out as dividends.

Example 3 *'For the foreseeable future, most of the cash resources generated by the Group's operations will be devoted to funding its expansion. Accordingly the Directors do not expect that RTS Networks will declare a dividend in the early years of its development. The Board will continue to review the appropriateness of its dividend policy.'* (*RTS Networks Group PLC, issued on AIM of* London Stock Exchange *in 1999)*

Type4: Firms do not have an intention to pay dividends and fail to anticipate the future dividend strategy.

Example 4 *'…It is inappropriate at the date of this document to give an indication of the likely amount of future dividends or when they may start to be paid...' (Airtech PLC, issued on AIM of* London Stock Exchange *in 1996)*

[92] In IPO prospectuses, firms frequently use the phrase, 'progressive dividend policy' to indicate they that have positive and active attitude toward paying dividends. In this study, Type1 IPOs have more progressive dividend policies than Type2, Type3 and Type4 IPOs. Accordingly, Type1 and Type2 IPOs have more progressive dividend policies than Type3 and Type4 IPOs.

From above examples, I can see that Type1 firms have the most active attitude to paying dividends, stating that they are going to start dividend payments after admission definitely. However, such declarations on dividend policy are in actual different from formal dividend announcements because they do not contain the accurate expressions on dividend level, ex-dividend date, record date and payment date. Type2 firms express that they pursue progressive dividend policies rhetorically, but the progress arrangement and sketchy level remain unveiled. They warn that they might miss out dividend payments due to uncertain prospects. Type3 firms express explicitly that they just have no intention to pay dividends in the near future, and Type4 firms are more conservative than other firms in paying dividends, as they provide no effective information about future dividend policy.

Table 4-2 shows data segmented for the five sub-periods 1996-2010, 1996-2009, 1996-2008, 1996-2007, and 1996-2006. I trace the date of dividend payment for each sampled firm from IPO to the end of 2011. For the sub-period 1996-2010, I can observe whether IPOs belonging to different types paid in 1st year after IPO. For the sub-period 1996-2009, the observable period extends to the first two successive post-IPO years. Similarly, the observable years are three, four and five for sub-periods 1996-2008, 1996-2007, and 1996-2006 respectively. This method allows us to compare the incidences of paying dividend for different IPO groups in a relatively reasonable way.

As expected, the greatest incidence of initiating dividends is found to be associated with Type1 IPOs. The likelihood to initiate dividends for Type2 IPOs is lower than that for Type1 IPOs but apparently higher than that for Type3 and Type4 counterparts. Accordingly, Type3 IPOs have slightly higher likelihood to initiate dividends than Type4 counterparts except for the sub-period 1996-2010. For example, for the sub-period 1996-2008, 97.89%[93] firms in Type1 actually paid out dividends in 5 years after IPO, but the percents of initiating dividends are only 39.84%, 9.59% and 5.26% for Type2, 3, and 4 firms, respectively, over the same observation window. The tiny discrepancy between Type3 and Type4 in respect of the style of dividend policy might foretell that the characteristics of the two groups of IPOs do not differ substantially, and this assumption is taken in to account in the following tests.

[93] An unreported result shows that only one of Type1 firms (Farsight Plc) default planned dividend initiation.

Table 4-2 Descriptive Statistics

All sample firms are classified into four types according to their willingness to pay dividends at the time of IPO. IPOs in the sample are grouped into the following four types according to their willingness to pay dividends at the time of IPO. Type1: The firms declare in their offering prospectuses that they determine to pay regular dividends after IPO and usually specify the details such as the dividend level and/or the timing of dividend payment. Type2: The firms state that they have intention to carry out active/progressive dividend policy depending on future operating performance, but they do not specify the details such as dividend level and/or the timing of dividend payment. Type3: The firms anticipate that they will not distribute dividends in the short or medium term, but usually they state that they will continue to review the appropriateness of its dividend policy. Type4: The firms do not have intention to pay dividends and do not provide any effective information about dividend policy. There are totally five sub-periods, 1996-2010, 1996-2009, 1996-2008, 1996-2007, and 1996-2006. I trace the date of dividend payment for each sampled firm from IPO to the end of 2011. For each sub-period, the column "IPO" shows the numbers of IPO observations sorted by dividend policy types. "Payer" shows the percentages of different type IPOs that paid dividends within different observed periods. For example, the observed period is the 1st post-IPO year for sub-period 1996-2010, and the two post-IPO years for sub-period 1996-2009. The columns "One", "Two", "Three", "Four" and "Five" show the numbers of IPOs that paid dividends in 1st , 2nd, 3rd, 4th, and 5th year after IPO, respectively.

Panel A. Dividend Payments One Year Post-IPO – Sample Period 1996-2010							
TYPE	IPO	Payer	One	Two	Three	Four	Five
1	357	71.99	257				
2	153	19.61	30				
3	320	0.94	3				
4	102	1.96	2				
Total	932	31.33	292				
Panel B. Dividend Payments Two Years Post-IPO – Sample Period 1996-2009							
1	352	94.89	252	82			
2	143	36.36	28	24			
3	310	3.87	3	9			
4	101	2.97	2	1			
Total	906	44.26	285	116			
Panel C. Dividend Payments Three Years Post-IPO – Sample Period 1996-2008							
1	351	97.15	251	82	8		
2	143	38.46	28	24	3		
3	309	5.83	3	9	6		
4	101	4.95	2	1	2		
Total	904	46.35	284	116	19		
Panel D. Dividend Payments Four Years Post-IPO – Sample Period 1996-2007							
1	349	97.71	249	82	8	2	
2	143	39.86	28	24	3	2	
3	308	8.12	3	9	6	7	
4	101	4.95	2	1	2	0	
Total	901	47.50	282	116	19	11	
Panel E. Dividend Payments Five Years Post-IPO – Sample Period 1996-2006							
1	332	97.89	237	77	8	2	1
2	128	39.84	25	21	3	2	0
3	292	9.59	3	9	6	7	3
4	95	5.26	2	1	2	0	0
Total	847	48.29	267	108	19	11	4

4.3.2 Data Description

Two categories of variables are employed in this part of study: measures of pre-IPO financial performance and a fraction of IPO-related factors that are used in Chapter 3. Three pre-IPO historical financial records are manually collected from profit and loss statements, balance sheets, and statements of cash flow provided by the offering prospectuses. For each of year prior to IPO, the following raw data are collected: total assets, earnings, net cash inflow from operating activities, increase in cash, total turnover, long-term debts, and net cash outflow from capital expenditure. To test the above hypotheses, I develop a set of financial ratios and growth variables (summarized in Table 4.3).

Table 4-3 Definitions of Variables

The table provides the list of variables and their definitions. In Panel D, the subscript *n* is equal to 1 if the increase if from t-1 to t, and 2 if the increase is during two consecutive periods from t-2 to t-1 and from t-1 to t.

Variable	Definitions
Panel A. Accounting 3-year Averages	
ROA	The average ratio of EBIT to total assets for the previous three fiscal years before IPO
CF/TA	The average ratio of Cash Inflow from operating activities to total assets for the previous three fiscal years before IPO
CF Change/TA	The average ratio of change in Cash between the penultimate and the last financial period to total assets for the previous three fiscal years before IPO
TURNOVER RATIO	The average ratio of Turnover to total assets for the previous three fiscal years before IPO
LEVERAGE	The average ratio of Long-term debt to total assets for the previous three fiscal years before IPO
CAPEX/TA	The average ratio of Capital Expenditure to total assets for the previous three fiscal years before IPO
Panel B. Accounting Last Fiscal Year Ratios	
ROA (-1Y)	The ratio of EBIT to total assets for the last fiscal year prior to IPO
CF/TA (-1Y)	The ratio of Cash Inflow from operating activities to total assets for the last fiscal year prior to IPO
CF Change/TA (-1Y)	The ratio of change in Cash between the penultimate and the last financial period to total assets for the last fiscal year prior to IPO
TURNOVER RATIO (-1Y)	The ratio of Turnover to total assets for the last fiscal year prior to IPO
LEVERAGE (-1Y)	The ratio of Long-term debt to total assets for the last fiscal year prior to IPO
CAPEX/TA (-1Y)	The ratio of Capital Expenditure to total assets for the last fiscal year prior to IPO
Panel C. IPO Characteristics	
DIRECTOR	Directors' Ownership, the percentage of enlarged ordinary shares held by directors after admission
VC STAKE	VC is the aggregate percentage of venture capital-backed stakes that are more than 3% of enlarged ordinary share capital immediately following admission. Following Ljungqvist and Wilhelm (2003), venture capital-backed shares include venture capital or private equity funds
VC-BACKED	A dummy variable equals to 1 if the IPO firm is VC-backed, 0 otherwise
INSTITUTION	The aggregate percentage of institutional stakes which are more than 3% of enlarged ordinary share capital immediately following admission
OPTION	The percentage of executive stock options, measured as the number of shares granted as stock options over the enlarged ordinary shares after admission
INSIDER LOCKUP	Locked-up directors’ shares
AGGREGATE LOCKUP	Aggregate locked-up shares
LOCKUP DAYS	The nature logarithm of days for lockup period during which locked-up shares are not allowed to be disposed

LOCKUP CONSENT	The nature logarithm of days for the full restriction period during which locked-up shares can only be sold with the consent of underwriters
REPUTATION	Underwriter reputation, computed as the relative market share of the investment bank underwriting the IPO (Megginson and Weiss, 1991)
AIM	A dummy variable equals to 1 if the IPO is listed on the Alternative Investment Market and 0 otherwise
HITECH	A dummy variable equals to 1 if the IPO is from the high technology industry and 0 otherwise
DP	Dividend premium, calculated as the logarithm of the difference between the market to book value of dividend payers and non-payers (Baker and Wurgler, 2004a)
BUBBLE	Defined as the period 1999-2000 following Ljungqvist and Wilhelm (2003) and Levis (2008)
DUMMY2000S	A dummy variable which equals 1 if IPO issues after the date of December 31, 2000, and 0 otherwise
LNGP	The nature logarithm of IPO proceeds as stated in the prospectus
UNDERPRICING[94]	The initial return calculated as the percentage difference between the offer price and the closing price of the first trading day
Panel D. Changes in Pre-IPO Financial Ratios	
G_n ROA	A dummy variable equals to 1 if the ratio of EBIT to total assets increased during years n, and 0 otherwise
G_n CF/TA	A dummy variable equals to 1 if the ratio of cash inflow from operating activities to total assets increased during years n, and 0 otherwise
G_n CFCHANGE/TA	A dummy variable equals to 1 if the Change in cash flow increased during years n, and 0 otherwise
G_n TURNOVER	A dummy variable equals to 1 if the TURNOVER RATIO increased during years n, and 0 otherwise
G_n LEVERAGE	A dummy variable equals to 1 if the long-term debt increased during years n, and 0 otherwise
G_n CAPEX/TA	A dummy variable equals to 1 if the ratio of capital expenditure to total assets increased during years n, and 0 otherwise
POSITIVE ROA	A dummy variable takes on the value of 1 if a IPO firm maintained positive profit during the financial period from t-2 to t, and 0 otherwise
POSITIVE CF	A dummy variable takes on the value of 1 if a IPO firm maintained positive Cash Inflow from operating activities during the financial period from t-2 to t, and 0 otherwise
POSITIVE CFCHANGE/TA	A dummy variable takes on the value of 1 if a IPO firm maintained positive Change in cash flow during the financial period from t-2 to t, and 0 otherwise

4.4 Empirical Results

4.4.1 Univariate Analysis

(1) Accounting 3-year Averages and Last Fiscal Year Ratios

As explained in the previous section, the entire sample used in this study is divided into four company types (Types 1, 2, 3 and 4) based on a firm's intention to pay dividends

[94] Although underpricing is not available when issuing firms release their offering prospectuses, I simply control this variable to examine the interrelationship between underpricing and the dividend policy in prospectus.

after floatation. For each company type, the mean, lower quartile, median and upper quartiles of indicator variables and t-statistics of difference in means between any two types of firms being calculated are reported.

The results of the categorical analysis on 3-year-average key financial ratios are presented in **Table 4-4, Panel A.** Type1 firms outperform significantly other firms in profitability (*ROA*) and cash flows (*CF/TA*) from operating activity with associated t-statistics of differences in means between Type1 and the other firms at 1% level. While type2 firms exhibit average cash flow from operations slightly higher than 0, their profitability is observed to be negative over pre-IPO stage. In comparison with Type1 and Type2, Type3 and Type4 are associated with lower and negative profitability and cash flows. Moreover, Type3 performs poorer ROA than Type4 and Type3 does not significantly differ from Type4 in *CF/TA* (t-statistics = -0.84).

In general, these findings are consistent with Benartzi, Michaely and Thaler (1997) who state that firms tend to pay dividends when earnings/profit increased. IPOs with active attitude towards dividend policy exhibited better financial performance during the previous three fiscal years, in terms of profitability and cash flow from their operating activities. It is somewhat surprising that pre-IPO profitability for Type2 is on average negative. Unlike Type1 firms, Type2 firms do not determine to pay dividends immediately after finishing IPO because they do not reach sustainable profitability. But on the other side, Type2 is virtually more profitable than Type3 and Type4.

Table 4-4, Panel A. also shows that Type1 and Type2 have higher *TURNOVER RATIO*s than Type3 and Type4, indicating that firms with the most active initial dividend policy are more efficient in utilising assets to raise revenue. There is no distinct difference in asset *TURNOVER RATIO* between Type1 and Type2 firms as the t-statistic of difference is 1.43 (> *p*-value 10%). Further, Type1 and Type2 are of lower capital expenditures ratios relative to Type3 and Type4, consistent with the predictions of residual, free cash flow and lifecycle hypotheses. It is possible that Type1 and Type2 are more mature and thereby spent less on capital expenditures, and as a result, they tend to implement a more active dividend policy. It is also notable that Type1 and Type2 firms are not statistically different in terms of capital expenditure ratios. In addition, different types do not significantly differ in long-term debt ratios or changes to cash flow. **Table 4-4, Panel B.** compares key financial ratios for the last fiscal years prior to IPO across different types. Overall, the results are consistent with the findings in **Table 4-4, Panel A**.

(2) IPO Characteristics

Table 4-4, Panel C. indicates that Type1 is distinct from other types in the following characteristics by using univariate method. Type1 firms are evidently larger (*LNGP*) and more likely to be underwritten by prestigious investment banks (*REPUTATION*) than non-Type1 firms with the associated t-statistics are all greater than 2.0. Type1 has lower venture capital backed stakes (*VC STAKE*) and institutional ownership (*INSTITUTION*) than Type3 and Type4, and shorter consent period of lock-up than Type2. In addition, although Type1 firms are of lower level of managerial options (*OPTION*) and aggregate locked-up shares (*AGGREGATE LOCKUP*) than non-Type1 firms, the associated t-statistics are only significant when comparing with Type3.

Type2 is significantly associated with higher managerial ownership (*DIRECTOR*), longer lockup period (*LOCKUP CONSENT*) and lower initial return (*UNDERPRICING*) in comparison with Type3 and Type4. In addition, Type2 features lower *OPTION*, *REPUTATION* and *LNGP*, and higher locked-up directors' shares (*INSIDER LOCKUP*) relative to Type3. Moreover, Type3 does not significantly distinguish from Type4 in firm characteristics, except that Type3 has higher *OPTION* than Type4.

I note, however, that the ownership of institutional investors reported in Table 4-4 is relatively low (mean value is 9.75% for Type1, 12.05% for Type2, 14.78% for Type3, and 16.11% for Type4). In particular, the corresponding median values for Type3 and Type4 are zeros. This is because many companies (471) have reported zero ownership in IPO prospectuses. If I exclude the firms that reported zero ownership, the mean and median are 23.67% and 17.38% for the whole sample. Hoque and Lasfer (2009) who use prospectuses to collect information on intuitional ownership as well report that 327 of 831IPOs[95] showed zero ownership of institutions in prospectuses over 1999-2006.

Table 4-4, Panel D shows that Type1 and Type2 firms are less likely to be backed by venture capitalists comparing with Type3 and Type4 firms. The percentages of VC backed firms are 42.58%, 50.98%, 58.44% and 57.84% for Type1, Type2, Type3 and Type4, respectively. Type1 and Type2 firms are also less likely to be from the high technology sectors. The percentages of high technology firms for Type1 and Type2 firms are 26.33% and 33.33%, economically lower than 52.81% and 59.8% for Type3

[95] As described in Section 4.3.1, my sample excluded the IPOs that did not include profit and loss statements, balance sheets, and a statement of cash flow for three pre-IPO fiscal years in prospectuses. Thus, my sample is smaller than Hoque and Lasfer (2009) over the sample period.

Table 4-4 Comparison of Pre-IPO Financial Ratios between Different Types

The sample includes 932 IPOs issued on London Stock Exchange from 1996 to 2010. IPOs in the sample are grouped into the following four types according to their willingness to pay dividends at the time of IPO. Type1: The firms declare in their offering prospectuses that they determine to pay regular dividends after IPO and usually specify the details such as the dividend level and/or the timing of dividend payment. Type2: The firms state that they have intention to carry out active/progressive dividend policy depending on future operating performance, but they do not specify the details such as dividend level and/or the timing of dividend payment. Type3: The firms anticipate that they will not distribute dividends in the short or medium term, but usually they state that they will continue to review the appropriateness of its dividend policy. Type4: The firms do not have intention to pay dividends and do not provide any effective information about dividend policy. The definations of remaining variables are presented in **Table 4-3**. The last three columns present the *t*-statistics of the differences in means between different type firms. *, **, *** denotes significance at 10%, 5% and 1%, respectively.

Type	N	Mean	Q1	Median	Q3	t-stat of difference between means		
						Type1	Type2	Type3
Panel A. Average 3-year Pre-IPO Financial Ratios (%)								
ROA								
Type1	357	9.74	3.76	7.50	13.69			
Type2	154	-8.21	-10.12	2.84	10.49	4.77***		
Type3	320	-53.37	-98.09	-23.24	0.51	14.42***	8.01***	
Type4	101	-35.81	-56.73	-20.75	1.56	7.22***	3.81***	-2.32**
CF/TA								
Type1	357	17.58	8.27	15.28	23.74			
Type2	154	0.93	-6.50	7.79	19.16	4.99***		
Type3	320	-33.91	-73.98	-8.98	9.25	14.15***	7.33***	
Type4	101	-28.48	-46.16	-9.90	4.72	8.4***	4.68***	-0.84
CF Change/TA								
Type1	357	2.04	-1.23	1.05	4.61			
Type2	154	3.14	-1.62	1.28	7.17	-0.99		
Type3	320	1.68	-3.92	0.77	8.58	0.32	1.00	
Type4	101	1.58	-3.90	0.17	8.32	0.30	0.87	0.06
TURNOVER RATIO								
Type1	357	184.24	93.21	165.75	247.83			
Type2	154	168.21	80.24	144.22	233.40	1.43		
Type3	320	109.30	8.12	79.09	173.54	8.73***	5.26***	
Type4	101	115.62	30.96	97.57	171.78	5.64***	3.72***	-0.52
LEVERAGE								
Type1	357	23.96	2.41	11.40	33.19			
Type2	154	22.57	0.52	8.65	28.74	0.43		
Type3	320	29.02	0.00	7.27	38.33	-1.62	-1.72*	
Type4	101	28.20	0.78	10.87	33.01	-0.88	-1.07	0.16
CAPEX/TA								
Type1	357	8.25	2.04	4.92	12.09			
Type2	154	9.15	1.56	5.78	13.37	-0.83		
Type3	320	13.90	2.74	9.94	21.88	-6***	-3.82***	
Type4	101	12.00	2.40	7.75	19.27	-2.6***	-1.72*	1.21
Panel B. Last Financial Year Ratios (%)								
Type	N	Mean	Q1	Median	Q3	t-stat of difference between means		
						Type1	Type2	Type3
ROA (-1Y)								
Type1	357	12.09	3.95	9.10	15.38			
Type2	154	-3.23	-9.31	4.21	13.11	4.05***		
Type3	320	-52.37	-74.58	-19.73	3.09	13.22***	8.22***	
Type4	101	-41.78	-63.44	-10.60	2.81	6.75***	4.43***	-1.15
CF/TA (-1Y)								
Type1	357	19.03	7.96	16.59	26.99			
Type2	154	6.18	-3.97	7.00	23.77	3.86***		
Type3	320	-28.77	-57.08	-10.22	8.99	12.94***	7.39***	
Type4	101	-24.07	-44.22	-3.79	10.60	7.16***	4.52***	-0.68
CF Change/TA (-1Y)								
Type1	357	1.72	-2.90	0.55	5.50			
Type2	154	4.19	-4.09	1.05	13.08	-1.39		
Type3	320	-0.02	-9.41	0.00	11.89	0.91	1.71*	
Type4	101	1.12	-5.82	1.00	10.31	0.23	0.99	-0.36
TURNOVER RATIO (-1Y)								
Type1	357	182.11	93.85	163.27	250.76			
Type2	154	157.97	70.62	134.70	234.68	2.15**		
Type3	320	104.23	4.85	69.29	170.97	8.98***	4.77***	
Type4	101	113.33	26.48	85.52	165.02	5.59***	3.13***	-0.74

Type	N	Mean	Q1	Median	Q3	t-stat of difference between means Type1	Type2	Type3
LEVERAGE (-1Y)								
Type1	357	23.25	0.75	0.75	250.76			
Type2	154	19.70	0.00	0.00	234.68	1.10		
Type3	320	28.02	0.00	0.00	170.97	-1.48	-2.17**	
Type4	101	26.62	0.00	0.00	165.02	-0.67	-1.28	0.26
CAPEX/TA (-1Y)								
Type1	357	7.77	1.38	4.90	10.28			
Type2	154	9.41	1.20	3.79	10.97	-1.08		
Type3	320	13.14	1.61	6.42	20.22	-4.29***	-2.15**	
Type4	101	12.85	2.24	6.86	19.04	-2.82***	-1.59	0.15

Panel C. IPO Characteristics

Type	N	Mean	Q1	Median	Q3	t-stat of difference between means Type1	Type2	Type3
DIRECTOR (%)								
Type1	357	31.67	7.35	28.22	50.60			
Type2	154	38.11	14.40	34.93	61.30	-2.55**		
Type3	320	30.55	8.48	28.93	45.54	0.59	2.99***	
Type4	101	30.36	12.16	27.05	49.00	0.52	2.56**	0.08
VC STAKE (%)								
Type1	357	9.97	0.00	0.00	15.40			
Type2	154	12.05	0.00	3.30	18.50	-1.24		
Type3	320	14.78	0.00	6.32	24.34	-3.45***	-1.51	
Type4	101	16.11	0.00	7.63	26.70	-2.74***	-1.61	-0.57
INSTITUITION (%)								
Type1	357	9.75	0.00	0.00	13.50			
Type2	154	11.10	0.00	0.00	14.22	-0.76		
Type3	320	13.45	0.00	4.78	20.64	-2.66***	-1.28	
Type4	101	14.00	0.00	4.05	22.12	-1.85*	-1.12	-0.24
OPTION (%)								
Type1	357	0.06	0.00	0.00	0.02			
Type2	154	0.08	0.00	0.00	0.05	-0.88		
Type3	320	0.24	0.00	0.02	0.11	-3.12***	-2.59***	
Type4	101	0.10	0.00	0.01	0.08	-1.46	-0.52	2.32**
INSIDER LOCKUP (%)								
Type1	313	30.94	7.35	7.35	0.02			
Type2	144	34.06	10.02	10.02	0.05	-1.21		
Type3	307	29.84	7.75	7.75	0.11	0.57	1.65*	
Type4	97	29.33	11.18	11.18	0.08	0.63	1.55	0.20
AGGEGATE LOCKUP (%)								
Type1	313	45.31	24.70	48.95	66.08			
Type2	144	46.87	25.68	50.30	69.42	-0.59		
Type3	307	49.25	31.23	51.68	70.80	-1.89*	-0.89	
Type4	97	49.01	24.78	49.75	74.03	-1.20	-0.61	0.08
LOCKUP DAYS								
Type1	313	418.59	360	360	467			
Type2	144	418.94	360	360	360	-0.02		
Type3	307	396.41	360	360	360	1.84*	1.40	
Type4	97	416.03	360	360	360	0.14	0.13	-1.07
LOCKUP CONSENT								
Type1	313	549.20	360	509	720			
Type2	144	666.42	360	720	720	-3.65***		
Type3	307	581.71	360	602	720	-1.61	2.61***	
Type4	97	583.40	360	720	720	-1.17	2.14**	-0.06
REPUTATION (%)								
Type1	357	1.41	0.18	0.59	1.79			
Type2	154	0.74	0.14	0.33	0.78	4.53***		
Type3	320	1.09	0.18	0.37	1.62	2.14**	-2.67***	
Type4	101	0.92	0.12	0.26	0.80	2.55**	-1.00	0.94
LNGP								
Type1	357	0.70	0.22	0.22	0.02			
Type2	154	0.34	-0.08	-0.08	0.01	6.06***		
Type3	320	0.47	0.02	0.02	0.02	4.59***	-2.11**	
Type4	101	0.37	-0.10	-0.10	0.01	4.54***	-0.44	1.26
UNDERPRICING (%)								
Type1	357	11.54	2.50	7.81	16.67			
Type2	152	8.62	2.44	7.02	14.00	2.34**		
Type3	318	14.81	1.79	7.50	15.83	-1.66*	-2.98***	
Type4	101	12.96	1.65	7.72	17.61	-0.57	-1.68*	0.62

Panel D. IPO Characteristics			
	VC-backed	Non VC-backed	VC-backed Percent (%)
Type1	152	205	42.58
Type2	78	75	50.98
Type3	187	133	58.44
Type4	59	43	57.84
	Hitech	Non Hitech	Hitech Percent (%)
Type1	94	263	26.33
Type2	51	102	33.33
Type3	169	151	52.81
Type4	61	41	59.80
	AIM	Main Market	AIM Percent (%)
Type1	172	185	48.18
Type2	130	23	84.97
Type3	253	67	79.06
Type4	79	23	77.45

and Type4 firms. Finally, Type1 firms are more likely to be issued on the main market rather than AIM. Only 48.18% of Type1 firms are based on AIM, compared to 84.97%, 79.06% and 77.45% for Type2, Type3 and Type4 firms, respectively.

(3) Changes in Pre-IPO Financial Ratios

In order to investigate the effects of changes in pre-IPO financial position on dividend policies as stated in IPO prospectuses, several growth variables are developed to measure the changes in financial performance before IPO.

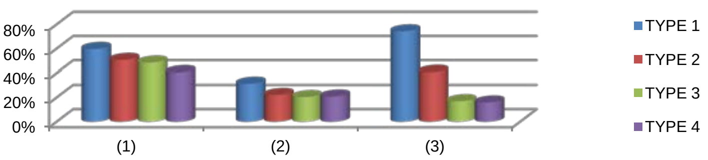
Figure 4-1, Panel A. illustrates that firms that experienced increase in earnings or maintained positive earnings are more likely to undertake active dividend policy when going public. The first bar diagram (1) indicates that the proportion of IPO firms that experienced the increase in ROA from t-1 to t descends from Type1 to Type4 orderly and monotonically. The proportions are 59.66% and 50.65% for Type1 and Type2 firms versus 48.44% and 40.59% for Type3 and Type4. Such relation is also applicable to the second diagram (2), indicating that the proportion of firms that experienced a continuous increase in ROA from t-2 to t-1 and from t-1 to t decreases from Type1 to Type4 in order. The third diagram (3) indicates that the proportion of IPO firms that maintained positive earnings during pre-IPO period (from t-2 to t) decreases from Type1 to Type4 in order.

Figure 4-1, Panel B. illustrates that firms that are capable of maintaining positive cash inflows from operating activities prior to IPO are more likely to undertake active dividend policy (Type1 and Type2) during the process of IPO. The proportions for Type1, Type2, Type3 and Type4 firms are 78.43%, 39.86%, 20.63% and 19.8%, respectively. However, different types of IPOs do not differ significantly in the

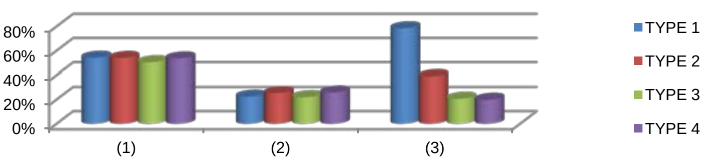
Figure 4-1 Pre-IPO Changes in Financial Ratios

The figure illustrates the percentage of IPOs that experienced three occasions, where t refers to the IPO year. (1) IPOs experienced increase in financial ratios from t-1 to t; (2) IPOs experienced continuously increase in financial ratios from t-2 to t-1 and from t-1 to t; (3) IPOs maintained positive earnings or cash inflow from operating activities during the financial period from t-2 to t. The sample includes 932 IPO firms listed in London Stock Exchange from 1996 to 2010. IPOs in the sample are grouped into the following four types according to their willingness to pay dividends at the time of IPO. Type1: The firms declare in their offering prospectuses that they determine to pay regular dividends after IPO and usually specify the details such as the dividend level and/or the timing of dividend payment. Type2: The firms state that they have intention to carry out active/progressive dividend policy depending on future operating performance, but they do not specify the details such as dividend level and/or the timing of dividend payment. Type3: The firms anticipate that they will not distribute dividends in the short or medium term, but usually they state that they will continue to review the appropriateness of its dividend policy. Type4: The firms do not have intention to pay dividends and do not provide any effective information about dividend policy. **Appendix 4-1** details the results.

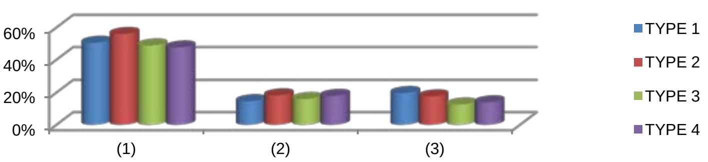
A. Pre-IPO Profitability



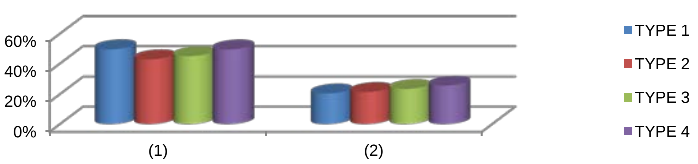
B. Pre-IPO Cash Inflow from Operating



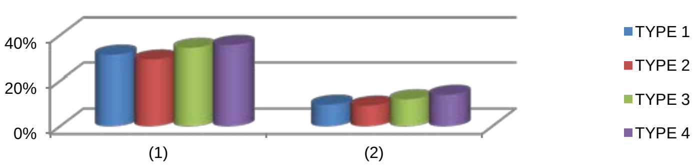
C. Pre-IPO Cash Change in Financial Period



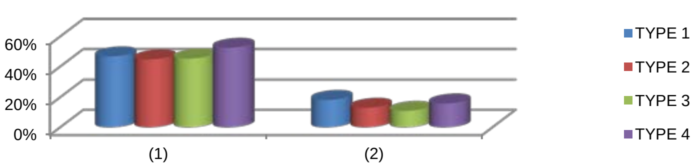
D. Pre-IPO Turnover



E. Pre-IPO Leverage



F. Pre-IPO Capital Expenditures



probability of exhibiting increases in cash flow from operation over pre-IPO phase. The monotonic relationship revealed above is not evident for the other financial ratios as the residual figures (**Panel C.D.E.F.**) shown.

4.4.2 Logistic Regression Analyses

(1) Cross-Sectional Binary Logistic Regressions

This section uses cross-sectional binary logistic regression model to investigate the determinants of dividend policy at the time of IPO. **Table 4-2** reports that 97.15% of measure Type1 firms honoured their promises to start paying dividends in the three post-IPO years, therefore Type1 IPOs make the definite decisions to initiate dividends. It is expected that Type1 firms differ significantly from other firms in the key characteristics that influence the dividend decisions. In the following multivariate logistic test, the dependent variable is equal to 1 if an IPO firm is categorized into Type1 and 0 otherwise. The predictor factors used include accounting 3-year averages, accounting last fiscal year ratios, IPO characteristics, changes in pre-IPO financial ratios (See **Table 4-3** for variable definitions). Eight logistic regression specifications are built up, following a procedure of model verification. The formula used in multivariate logistic regressions is:

$$\log\left(\frac{\mathrm{P}(y_i=1|X_i)}{\mathrm{P}(y_i=0|X_i)}\right) = \beta_0 + \beta_i X_i \tag{4-3}$$

where X_i represents the vector of control variables, and *i* is the number of control variables in each regression.

Table 4-5, Panel A shows the results from estimating logistic regressions with accounting 3-year averages and accounting last fiscal year ratios as explanatory variables. The results indicate that Type1 firms have on average higher profitability, cash flow from operation and of high turnover ratio over pre-IPO stage than other firms, as the estimated coefficients of *ROA*, *CF/TA* and *TURNOVER RATIO* are positive and significant at a 1% level. These results are consistent with the findings obtained in the categorical analyses (**Table 4-4)**. In addition, both the coefficients of *ROA (-1Y)* and *CF/TA (-1Y)* are positive and significant, suggesting that dividend policies are significantly influenced by IPOs' profitability and cash flow in the last fiscal year prior to IPO. As shown in Model (5), the significant and negative coefficient of *CAPEX/TA* suggests that firms are likely to follow the residual theory when they set up their dividend strategy. In contrast, the results indicate that neither *LEVERAGE* (Model (3)) nor *CF Change/TA* (Model (6)) have significant effect on IPOs' dividend policies.

A number of factors that tend to drive IPOs to reject Type1 dividend policy encompass VC backing (*VC-BACKED*), managerial option (*OPTION* and *IFOPTION*), institutional holding (*IFINST),* lockup period (*LOCKUP CONSENT*), the quoted junior stock market (*AIM*), Technology intensity (*HITECH*), bubble period (*BUBBLE*) and quotation during the post-2000 period (*DUMMY2000S*). On the contrary, the coefficients of *LNGP* (gross proceeds) and *REPUTATION* (the choice of reputable underwriter) are significantly positive, indicating that large firms collaborating with reputable underwriters tend to declare active dividend policy when going public.

In contrast, the t-values of venture capitalist backing (*VC),* Locked-up directors' shares (*INSIDER LOCKUP*), and aggregate locked up shares (*AGGREGATE LOCKUP*) are sensitive to inclusion of other control variables. For instance, when controlling for *REPUTATION* in Model (4), *p*-value of *VC* is 0.11, which is lower than the standard of significance. The estimated coefficients of *VC* are significantly negative in Model (6) and (7). Moreover, none of the coefficients on the length of lockup *(LOCKUP DAYS)*, director ownership (*DIRECTOR*) and the dividend premium (*DP*) is statistically significant in the relevant regression models.

Table 4-5, Panel B shows the results from estimating logistic regressions with growth variables to capture the effects of dynamic changes in financial ratios on dividend policy at IPO stage. The coefficients of growth in earnings (*G1 ROA*, *G2 ROA*) and maintain positive earnings (*POSITIVE ROA*) are positive and significant at 1% level, suggesting that IPOs undertaking Type1 dividend policy experienced the changes in earnings in positive direction. Similarly, the estimated coefficients on *POSITIVE CF* (firms maintain positive cash flow from operation prior to IPO) and *POSITIVE CFCHANGE/TA* (firms maintain positive change in cash flow prior to IPO) is positive and significant. On the contrary, the estimated coefficients on growth in cash flow (*G1 CF/TA*, *G2 CF/TA)* and growth in change in cash flow (*G1 CFCHANGE/TA*) are not statistically significant. The remaining results are qualitatively similar to the results raised in **Table 4-5,** Panel A, with three the flowing exceptions: the coefficients of *INSTITUITION* and VC stake are significantly negative in all regression models; the coefficients of *AGGREGATE LOCKUP* are not significant in any regressions; the coefficient of *LOCKUP CONSENT* is not significant in Model (4).

Table 4-5 Logistic Regressions on the Willingness of paying Dividends at IPO stage

This sample includes 932 IPO firms listed in London Stock Exchange from 1996 to 2010. The IPO prospectuses contain a section stating the proposed dividend policy. IPOs in the sample are grouped into the following four types according to their willingness to pay dividends at the time of IPO. Type1: The firms declare in their offering prospectuses that they determine to pay regular dividends after IPO and usually specify the details such as the dividend level and/or the timing of dividend payment. Type2: The firms state that they have intention to carry out active/progressive dividend policy depending on future operating performance, but they do not specify the details such as dividend level and/or the timing of dividend payment. Type3: The firms anticipate that they will not distribute dividends in the short or medium term, but usually they state that they will continue to review the appropriateness of its dividend policy. Type4: The firms do not have intention to pay dividends and do not provide any effective information about dividend policy. The dependent variable equals to one if an observed IPO belongs to Type1, and zero otherwise. The explanatory variables are as defined in **Table 4-3**. *p*-values are reported in parentheses. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Panel A. With Accounting Variables as Explanatory Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ROA	3.52*** (0.00)							
CF/TA		3.69*** (0.00)						
LEVERAGE			-0.22 (0.27)					
TURNOVER				0.44*** (0.00)				
CAPEX/TA					-3.37*** (0.00)			
CF CHANGE/TA						-0.02 (0.97)		
ROA(-1Y)							3.04*** (0.00)	
CF/TA(-1Y)								2.49*** (0.00)
AIM	-1.16*** (0.00)				-1.91*** (0.00)			
HITECH		-0.65*** (0.00)				-0.91*** (0.00)		-0.78*** (0.00)
LNGP			0.88*** (0.00)				0.97*** (0.00)	
REPUTATION				21.41*** (0.00)				13.38** (0.01)
INSTITUTION	-0.68 (0.2)						-1.09* (0.05)	
IFINST		-0.34** (0.04)						-0.5*** (0.00)
DIRECTOR			-0.14 (0.67)		0.36 (0.37)			

VC STAKE				-0.75		-1.04**	-0.89*	
				(0.11)		(0.02)	(0.09)	
VC-BACKED			-0.55***		-0.7***			-0.35**
			(0.00)		(0.00)			(0.04)
OPTION				-166.27**	-138.79**			-188.61**
				(0.01)	(0.03)			(0.01)
IFOPTION			-0.56***			-0.4**	-0.44**	
			(0.00)			(0.01)	(0.02)	
INSIDER LOCKUP	-0.65*					-0.38		-0.84**
	(0.09)					(0.23)		(0.02)
AGGREGATE LOCKUP		-0.88**			-0.14		-0.71**	
		(0.01)			(0.71)		(0.04)	
LOCKUP DAYS			0.32				-0.21	
			(0.14)				(0.43)	
LOCKUP CONSENT				-0.33*				-0.5**
				(0.08)				(0.01)
DUMMY2000S	-1.24***			-1.58***			-1.78***	
	(0.00)			(0.00)			(0.00)	
DP			0.57			0.14	0.17	-0.89
			(0.48)			(0.86)	(0.86)	(0.35)
Constant	1.46***	0.20	-2.04	1.86	1.61***	0.33	2.26	3.18**
	(0.00)	(0.31)	(0.14)	(0.12)	(0.00)	(0.35)	(0.18)	(0.02)
χ^2	332.95	243.96	80.30	202.95	203.65	56.96	335.26	246.98
Pseudo R^2	0.30	0.22	0.07	0.18	0.18	0.05	0.30	0.22

Panel B. With Changes in Accounting Variables as Explanatory Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G1 ROA	0.67***							
	(0.00)							
G2 ROA		0.59***						
		(0.00)						
POSITIVE ROA			2.23***					
			(0.00)					
G1 CF/TA				0.18				
				(0.25)				
G2 CF/TA					-0.11			
					(0.56)			
POSITIVE CF/TA						2.24***		
						(0.00)		
G1 CFCHANGE/TA							0.04	
							(0.81)	
POSITIVE CFCHANGE/TA								0.46**
								(0.02)
AIM	-1.33***				-1.86***			
	(0.00)				(0.00)			

HITECH		-0.94***				-0.71***		-0.98***
		(0.00)				(0.00)		(0.00)
LNGP			0.77***				1.02***	
			(0.00)				(0.00)	
REPUTATION				20.18***				15.47***
				(0.00)				(0.00)
INSTITUTION	-1.25**						-1.77***	
	(0.01)						(0.00)	
IFINST		-0.55***						-0.62***
		(0.00)						(0.00)
DIRECTOR			-0.78**		0.37			
			(0.03)		(0.35)			
VC STAKE				-1.13**		-1.05**	-1.59***	
				(0.01)		(0.04)	(0.00)	
VC-BACKED			-0.44**		-0.71***			-0.39**
			(0.01)		(0.00)			(0.01)
OPTION				-172.36**	-137.61**			-231.52***
				(0.01)	(0.03)			(0.00)
IFOPTION			-0.44**			-0.35*	-0.61***	
			(0.01)			(0.05)	(0.00)	
INSIDER LOCKUP	0.02					-0.8**		-0.40
	(0.96)					(0.03)		(0.24)
AGGREGATE LOCKUP		-0.47			-0.20		-0.30	
		(0.11)			(0.58)		(0.35)	
LOCKUP DAYS			-0.03				-0.24	
			(0.91)				(0.33)	
LOCKUP CONSENT				-0.19				-0.58***
				(0.31)				(0.00)
DUMMY2000S	-1.32***			-1.68***			-1.83***	
	(0.00)			(0.00)			(0.00)	
DP			-0.66			-0.09	0.80	-0.75
			(0.47)			(0.92)	(0.36)	(0.4)
Constant	0.97***	0.20	-1.40	1.68	1.31***	-0.88**	2.71*	3.8***
	(0.00)	(0.28)	(0.36)	(0.15)	(0.00)	(0.03)	(0.08)	(0.00)
χ^2	191.52	81.42	264.99	164.93	181.62	255.81	207.21	140.68
Pseudo R^2	0.17	0.07	0.23	0.15	0.16	0.23	0.18	0.12

(2) Cross-Sectional Ordinal Logistic Regressions

In this section, cross-sectional ordinal logistic regressions are used to examine the determinants of the dividend policies at IPO stage. Ordinal logistic regression model has the advantage over binary logistic regression model in investigating events that have more than two outcomes. The equation is written as:

$$log(P_j) = \beta_j + \beta_i X_i \qquad (4-4)$$

where X_i indicates a vector of control variables and 'i' is the number of control variables. The term, β_j, function as the interceptor in a linear regression. However, the coefficients β_i remain the same for all odds. The number of odds is the number of categories minus one. Therefore, given there are three orders, P_j $, j = 1, 2$ are the following:

$$P_1 = \frac{Probability\ (Type1)}{Probability\ (Type2/Type3)} \qquad (4-5)$$

$$P_2 = \frac{Probability\ (Type1/Type2)}{Probability\ (Type3)} \qquad (4-6)$$

I first arrange three orders in the test with dependent variable equaling 1, 2 and 3, corresponding to dividend policies of Type1, Type2 and the rest (Type3 and Typee4). Setting jointly Type3 and Type4 as one order is due to that Type3 firms resemble Type4 firms in terms of their style of dividend policy and firm characteristics. By doing so, IPO firms declaring active dividend policies, such as Type1 and Type2, are taking smaller values in regressions. As a result, if a control variable is associated with more active dividend policy its coefficient is expected to be negative. In ordinal logistic analysis, the explanatory variables are those variables used in the binary logistic regression analysis (**Table 4-5, Panel A** and **Table 4-5, Panel B**).

Table 4-6 shows the results from running ordinal logistic regressions with three orders. The overall estimates are qualitatively consistent with the results generated from binary logistic analysis. For example, the estimated coefficients of *ROA*, *CF/TA*, *TURNOVER*, *ROA(-1Y)* and CF/TA(-1Y) (**Panel A.)** and *G1 ROA*, *G2 ROA*, *POSITIVE ROA and POSITIVE CF* (**Panel B**) are negative and statistically significant, indicating that these factors have a positive correlation with active dividend policies declared in IPO prospectuses. On the contrary, capital expenditure has a negative influence on the possibility that IPOs decide to undertake active dividend policies since the coefficient of *CAPEX/TA* in Model (5) of **Panel A** is positive and significant. In addition, coefficient of G2 TURNOVER is positive and significant as Model (7) of **Panel B** shows.

It is noticeable the results on *AGGREGATE LOCKUP*, *LOCKUP CONSENT* and *DP* are distinguishable from those generated from binary logistic regressions while the results on the rest of proxy variables remain constant qualitatively. The coefficients of *AGGREGATE LOCKUP* are significantly positive in Model (2), (5), (7), indicating a monotonously negative relation between the willingness of executing active dividend policies and the percent of aggregate locked-up shares. The coefficients of *LOCKUP CONSENT* are insignificant in all regression models except Model (8) in **Table 4-6, Panel B**. Consistent with the expectation suggested by catering theory, the proxy variable of dividend catering (*DP*) has positive and significant coefficients in Model 3 of **Panel A** and Model (3) and Model (7) of **Panel B**.

In order to check if results are sensitive to different classifications concerning IPOs, I implement a robust test in which the responsive variables are 1, 2, 3 and 4 for Type1, Type2, Type3 and Type4 respectively. **Table 4-7** shows that the overall results remained unchanged qualitatively compared with the results in **Table 4-6**, with the exception that the coefficients of *LOCKUP CONSENT* are insignificant in all regression models. In general, the results do not change significantly when using different classifications.

Table 4-6 Ordinal Logistic Regressions on the Willingness of Paying Dividends at IPO stage (1)

This sample includes 932 IPO firms listed in London Stock Exchange from 1996 to 2010. The IPO prospectuses contain a section stating the proposed dividend policy. IPOs in the sample are grouped into the following four types according to their willingness to pay dividends at the time of IPO. Type1: The firms declare in their offering prospectuses that they determine to pay regular dividends after IPO and usually specify the details such as the dividend level and/or the timing of dividend payment. Type2: The firms state that they have intention to carry out active/progressive dividend policy depending on future operating performance, but they do not specify the details such as dividend level and/or the timing of dividend payment. Type3: The firms anticipate that they will not distribute dividends in the short or medium term, but usually they state that they will continue to review the appropriateness of its dividend policy. Type4: The firms do not have intention to pay dividends and do not provide any effective information about dividend policy. The dependant variables for Type1, Type2 IPOs are 1, 2 respectively. The dependant variables for Type3 and Type4 IPOs are 3. The explanatory variables are as defined in **Table 4-3**. *p*-values are reported in parentheses. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Panel A. With Accounting Ratios as Explanatory Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ROA	-2.35***							
	(0.00)							
CF/TA		-2.77***						
		(0.00)						
LEVERAGE			0.24					
			(0.16)					
TURNOVER				-0.47***				
				(0.00)				
CAPEX/TA					3.21***			
					(0.00)			
CFCHANGE/TA						-0.20		
						(0.68)		
ROA(-1Y)							-2.18***	
							(0.00)	
CF/TA(-1Y)								-2.29***
								(0.00)
AIM	0.88***				1.64***			
	(0.00)				(0.00)			
HITECH		0.64***				0.94***		0.77***
		(0.00)				(0.00)		(0.00)
LNGP			-0.71***				-0.64***	
			(0.00)				(0.00)	
REPUTATION				-16.46***				-9.35**
				(0.00)				(0.03)
INSTITUTION	0.65						0.84*	
	(0.13)						(0.06)	
IFINST		0.35**						0.4**
		(0.02)						(0.01)
DIRECTOR			-0.11		-0.88**			
			(0.69)		(0.01)			

VC STAKE				0.59		0.96**	0.76*	
				(0.13)		(0.01)	(0.07)	
VC-BACKED			0.49***		0.63***			0.35**
			(0.00)		(0.00)			(0.02)
OPTION				147.22***	119.95**			152.69***
				(0.00)	(0.01)			(0.00)
IFOPTION			0.65***			0.52***	0.58***	
			(0.00)			(0.00)	(0.00)	
INSIDER LOCKUP	0.47					0.25		0.75**
	(0.14)					(0.38)		(0.02)
AGGREGATE LOCKUP		0.87***			0.61*		0.83***	
		(0.00)			(0.05)		(0.00)	
LOCKUP DAYS			-0.36*				0.04	
			(0.08)				(0.87)	
LOCKUP CONSENT				0.12				0.21
				(0.47)				(0.23)
DUMMY2000S	1.01***			1.32***			1.42***	
	(0.00)			(0.00)			(0.00)	
DP			-1.35*			-0.78	-1.01	0.15
			(0.06)			(0.27)	(0.2)	(0.86)
/cut1	1.15	0.31	-1.86	0.37	1.44	0.60	1.72	1.58
/cut2	2.09	1.21	-1.12	1.21	2.29	1.34	2.68	2.50
χ^2	328.75	290.57	84.86	204.17	216.69	82.84	349.25	301.63
Pseudo R^2	0.19	0.17	0.05	0.12	0.12	0.05	0.20	0.17
Panel B. With Changes in Accounting Ratios as Explanatory Variables								
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G1 ROA	-0.55***							
	(0.00)							
G2 ROA		-0.52***						
		(0.00)						
POSITIVE ROA			-2.1***					
			(0.00)					
G1 CF/TA				-0.18				
				(0.2)				
G2 CF/TA					0.10			
					(0.55)			
POSITIVE CF/TA						-2.05***		
						(0.00)		
G2 TURNOVER							0.29*	
							(0.09)	
G1 LEVERAGE								-0.02
								(0.9)
AIM	1.07***				1.6***			
	(0.00)				(0.00)			

HITECH		0.97***				0.7***		0.98***
		(0.00)				(0.00)		(0.00)
LNGP			-0.57***				-0.74***	
			(0.00)				(0.00)	
REPUTATION				-15.03***				-12.9***
				(0.00)				(0.00)
INSTITUTION	1.08**						1.5***	
	(0.01)						(0.00)	
IFINST		0.54***						0.53***
		(0.00)						(0.00)
DIRECTOR			0.28		-0.88**			
			(0.37)		(0.01)			
VC STAKE				1.01**		0.88**	1.34***	
				(0.01)		(0.04)	(0.00)	
VC-BACKED			0.39**		0.63***			0.4***
			(0.01)		(0.00)			(0.00)
OPTION				146.23***	115.49**			175.94***
				(0.00)	(0.01)			(0.00)
IFOPTION			0.58***			0.56***	0.71***	
			(0.00)			(0.00)	(0.00)	
INSIDER LOCKUP	-0.18					0.58*		0.23
	(0.55)					(0.06)		(0.44)
AGGREGATE LOCKUP		0.51*			0.66**		0.57**	
		(0.05)			(0.04)		(0.04)	
LOCKUP DAYS			-0.07				0.10	
			(0.74)				(0.64)	
LOCKUP CONSENT				-0.04				0.32*
				(0.82)				(0.05)
DUMMY2000S	1.12***			1.44***			1.55***	
	(0.00)			(0.00)			(0.00)	
DP			-0.49			-0.97	-1.63**	-0.16
			(0.52)			(0.21)	(0.03)	(0.84)
/cut1	0.72	0.25	-1.47	0.19	1.15	-0.29	2.47	2.51
/cut2	1.53	1.01	-0.53	0.98	1.97	0.63	3.30	3.30
χ^2	163.08	104.60	290.82	145.81	187.85	287.24	195.47	152.05
Pseudo R^2	0.09	0.06	0.17	0.08	0.11	0.16	0.11	0.09

Table 4-7 Ordinal Logistic Regressions on the Willingness of Paying Dividends at IPO stage (2)

This sample includes 932 IPO firms listed in London Stock Exchange from 1996 to 2010. The IPO prospectuses contain a section stating the proposed dividend policy. IPOs in the sample are grouped into the following four types according to their willingness to pay dividends. Type1: The firms announce that they determine to pay regular dividends after IPO and usually specify the dividend level and/or the timing of dividend payment. Type2: The firms state that they have intention to carry out active/progressive dividend policy depending on future operating performance, but they do not specify the dividend level and/or the timing of dividend payment. Type3: The firms anticipate that they will not pay out dividends in the short or medium term. Type4: The firms currently do not have intention to pay dividends and provide limited information about dividend policy. The dependant variables for Type1, Type2, Type3, and Type4 firms are 1, 2, 3 and 4 respectively. The explanatory variables are as defined in **Table 4-3**. *p*-values are reported in parentheses and significance levels are indicated. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Panel A. With Accounting Ratios and as Explanatory Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ROA	-1.04***							
	(0.00)							
CF/TA		-1.41***						
		(0.00)						
LEVERAGE			0.20					
			(0.2)					
TURNOVER				-0.42***				
				(0.00)				
CAPEX/TA					2.33***			
					(0.00)			
CFCHANGE/TA						-0.12		
						(0.78)		
ROA(-1Y)							-0.86***	
							(0.00)	
CF/TA(-1Y)								-1.29***
								(0.00)
AIM	0.83***				1.53***			
	(0.00)				(0.00)			
HITECH		0.69***				0.92***		0.74***
		(0.00)				(0.00)		(0.00)
LNGP			-0.66***				-0.59***	
			(0.00)				(0.00)	
REPUTATION				-15.75***				-10.34**
				(0.00)				(0.01)
INSTITUTION	0.60						0.85**	
	(0.11)						(0.02)	
IFINST		0.32**						0.38**
		(0.01)						(0.01)
DIRECTOR			-0.12		-0.74**			
			(0.67)		(0.02)			
VC STAKE				0.51		0.83**	0.77**	
				(0.14)		(0.02)	(0.03)	

VC-BACKED			0.44***		0.57***			0.31**
			(0.00)		(0.00)			(0.02)
OPTION				21.98**	19.38**			26.99***
				(0.02)	(0.03)			(0.00)
IFOPTION			0.55***			0.43***	0.45***	
			(0.00)			(0.00)	(0.00)	
INSIDER LOCKUP	0.23					0.22		0.54*
	(0.42)					(0.42)		(0.06)
AGGREGATE LOCKUP		0.6**			0.5*		0.46*	
		(0.02)			(0.08)		(0.07)	
LOCKUP DAYS			-0.28				0.07	
			(0.16)				(0.75)	
LOCKUP CONSENT				0.10				0.16
				(0.5)				(0.29)
DUMMY2000S	0.86***			1.21***			1.21***	
	(0.00)			(0.00)			(0.00)	
DP			-1.54**			-0.91	-1.26*	-0.20
			(0.02)			(0.18)	(0.07)	(0.8)
/cut1	0.62	0.21	-0.73	0.00	1.00	-0.28	2.02	2.06
/cut2	1.43	0.96	0.20	0.78	1.80	0.64	2.84	2.83
/cut3	3.50	3.05	2.47	2.81	3.92	2.95	4.98	4.94
χ^2	148.29	99.70	277.30	109.41	155.32	275.88	169.21	121.95
Pseudo R^2	0.07	0.05	0.13	0.05	0.07	0.13	0.08	0.06

Panel B. With Changes in Accounting Ratios as Explanatory Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G1 ROA	-0.54***							
	(0.00)							
G2 ROA		-0.48***						
		(0.00)						
POSITIVE ROA			-2.03***					
			(0.00)					
G1 CF/TA				-0.08				
				(0.55)				
G2 CF/TA					0.15			
					(0.33)			
POSITIVE CF/TA						-1.95***		
						(0.00)		
G2 LEVERAGE							0.15	
							(0.49)	
G1 CAPEX/TA								0.04
								(0.74)
AIM	1.03***				1.53***			
	(0.00)				(0.00)			

HITECH		0.97***				0.67***		0.95***
		(0.00)				(0.00)		(0.00)
LNGP			-0.51***				-0.67***	
			(0.00)				(0.00)	
REPUTATION				-15.11***				-13.51***
				(0.00)				(0.00)
INSTITUTION	0.9**						1.24***	
	(0.02)						(0.00)	
IFINST		0.49***						0.5***
		(0.00)						(0.00)
DIRECTOR			0.24		-0.77**			
			(0.41)		(0.01)			
VC STAKE				0.88**		0.67*	1.1***	
				(0.01)		(0.07)	(0.00)	
VC-BACKED			0.32**		0.56***			0.36**
			(0.02)		(0.00)			(0.01)
OPTION				17.55*	18.02**			26.48***
				(0.05)	(0.04)			(0.00)
IFOPTION			0.43***			0.43***	0.56***	
			(0.00)			(0.00)	(0.00)	
INSIDER LOCKUP	-0.16					0.48*		0.18
	(0.57)					(0.09)		(0.52)
AGGREGATE LOCKUP		0.49*			0.55*		0.45*	
		(0.05)			(0.06)		(0.07)	
LOCKUP DAYS			0.03				0.07	
			(0.87)				(0.75)	
LOCKUP CONSENT				-0.05				0.25
				(0.73)				(0.11)
DUMMY2000S	1.01***			1.35***			1.38***	
	(0.00)			(0.00)			(0.00)	
DP			-0.84			-1.19*	-1.76**	-0.59
			(0.24)			(0.09)	(0.01)	(0.44)
/cut1	0.62	0.21	-0.73	0.00	1.00	-0.28	2.02	2.06
/cut2	1.43	0.96	0.20	0.78	1.80	0.64	2.84	2.83
/cut3	3.50	3.05	2.47	2.81	3.92	2.95	4.98	4.94
χ^2	148.29	99.70	277.30	109.41	155.32	275.88	169.21	121.95
Pseudo R^2	0.07	0.05	0.13	0.05	0.07	0.13	0.08	0.06

4.4.3 Abnormal Returns on Dividend Initiations and Long-Run Aftermarket Performance

(1) Event Study

To understand the connotation of various dividend policies declared in IPO prospectuses in the context of information mechanism, the abnormal returns of dividend initiations are examined using event study methodology. Previous theoretical literature suggests that dividends contain inner information of corporations (Lintner, 1956) and serve to balance the information between informed and uninformed participants under imperfect market circumstances (Miller and Modigliani, 1961; Bhattacharya, 1979; Miller and Rock, 1985, and John and Williams, 1985). If stock investors consider increase (decrease) in dividends as good news (bad news) for companies they invest, stock appreciation (depreciation)[96] will occur subsequently. Asquith and Mullins (1983) argue that dividends' effects should be most visible at initiation since the very first cash payout represents the abrupt transition of dividend strategy, and they report that the 2-day excess return on dividend initiation is +3.7% with t-statistic of 6.59. Similarly, Healy and Palepu (1988), Michaely, Thaler, and Womack (1995), and Lipson, Maquieira and Megginson (1998) find evidence regarding positive abnormal returns on dividend initiation announcements[97].

As introduced above, dividend policies written in IPO prospectuses create a certain informational imbalance. Type1 firms release the most detailed aftermarket dividend plans. Type2 firms state that they will pursue a progressive dividend policy. By contrast, Type3 and Type4 firms release limited information on dividend policy. Hence, I may expect that the dividend initiation announcements tend to trigger greater informational surprise if IPOs release more ambiguous dividend policies at the time of IPO.

H20: *The abnormal returns of dividend initiation announcements correlate negatively with the transparency of dividend policies stated at IPO stage.*

A standard event study methodology (Brown and Warner, 1985; Mackinlay,

[96] Charest (1978) finds that the announcements of dividend increase generate positive excess returns. Aharony and Swary (1980) find that the qualitatively similar result after controlling the effect of contemporaneous earning announcements.
[97] Healy and Palepu (1988) report statistically significant two-day excess returns of +3.9%; Michaely, Thaler, and Womack (1995) report statistically significant three-day excess returns of +3.4%; Lipson, Maquieira and Megginson (1998) report statistically significant two-day excess returns of +1.53%.

1997)[98] is used to measure the market reaction to dividend initiation announcements. The abnormal return for firm *i* and a single observed day t in the event window t is computed as:

$$AR_{it} = R_{it} - ER_{it} \qquad (4-7)$$

where AR_{it}, R_{it} and ER_{it} represent abnormal return, actual return and expected return. Follow previous dividend studies[99], expected return (ER_{it}) is estimated by market model in which the market portfolio selected is FTSE All-Share Index.

$$R_{iT} = \alpha_i + \beta_i R_{mT} + \varepsilon_{iT} \qquad (4-8)$$

where R_{iT} and R_{mT} stand for the returns of individual stocks and of market portfolio over the estimation window respectively. ε_{iT} is the zero mean disturbance term. α_i and β_i are then used to calculate ER_{it} with using the actual market return R_{mt} over the event window.

$$ER_{it} = \alpha_i + \beta_i R_{mt} \qquad (4-9)$$

The average daily abnormal return at the event date *t* is the mean across the observations:

$$\overline{AR_t} = N^{-1} \sum_{i=1}^{N} AR_{it} \qquad (4-10)$$

The cumulative abnormal returns over the event window (t1, t2) can be calculated as:

$$CAR_{t1,t2} = \sum_{t=t1}^{t2} \overline{AR_t} \qquad (4-11)$$

The t-value of CARs (Rubac, 1982; Bonnier and Bruner, 1989; Mackinlay and Hamill, 1997) is:

$$t\left(CAR_{t1,t2}\right) = \frac{CAR_{t1,t2}}{\sqrt{(t2-t1+1)var_{t1,t2}(\overline{AR_t}) + 2(t2-t1)cov_{t1,t2}(\overline{AR_t}, \overline{AR_{t-1}})}} \qquad (4-12)$$

Table 4-8 reports the abnormal returns to dividend initiation announcement for several event windows encompassing (-1,1), (-3,3), (-3,-1), (-1,0), 0, (0,1) and (1,3) trading days where day 0 refers to the date of dividend initiation announcement. Short event windows are selected for the purpose of keeping away from the contamination of other influential information releases such as announcements of earnings and M&A. In this section, the market models are estimated using the 60-days estimation window (-90,-30) trading days relative to the dividend initiation announcement day. During the process there are totally 404 announcements as event observations. Since taking longer estimation windows tends to downsize the numbers of usable observations, I further use a shorter 30-days estimation window (-60,-30) which leads to 457 observations to check

[98] Ball and Brown (1968) and Fama et al. (1969) developed earlier seminal method of event study.
[99] Compbell and Wasley (1993); Lasfer (1995); Lipson et al. (1998); McCaffrey and Hamill (2000); Jain, et al. (2009)

the sensitivity of the results. In estimation, seven subgroups (All, Type1, Type2, Type3, Type4, Type2&3&4 and Type3&4) are set up.

The following findings can be drawn from the results. First, in line with prior studies, the significant positive cumulative abnormal returns (CARs) to dividend initiation announcements are observed for the full sample as shown in "ALL" column. With the exception of event window (1, 3), the excess returns are positive with *p*-values smaller than 5% for all event windows. For example, the CAR for event window (-3, 3) is 0.0229 and significant at 1% level. Second, in line with above hypothesis (H20), CARs of Type1 IPOs are lower than those of non-Type1 counterparts (Type2, Type2&3&4 and Type3&4) and full sample (ALL) for the two primary event windows (-1,1) and (-3,3). Such relation holds basically between Type1 and Type2 for event windows (-1, 0), 0, (0, 1). For example, the excess returns of TYPE1 and TYPE2 are 0.0114 and 0.0281 for event window (-1, 0) respectively. Third, however, contrary to what we expected, TYPE2 has the greatest and significant CARs over the major event windows. In contrast, neither TYPE3 nor TYPE4 has the statistically significant CARs. This finding might suggest that the investors only regard the dividend initiations of non-technological companies as good news. As revealed in Table 4-4, the proportion of TYPE2 IPOs belonging to high technology industries is distinctively low relative to TYPE3 or TYPE4 counterparts. Fourth, only TYPE1 has the significant CAR over the event window (-3,-1), indicating that TYPE1 companies are materially affected by the possible information leakage before dividend initiation announcements. When I use 30-days estimation window (-60,-30) in estimating market model, the results (Appendix 4-1) are qualitatively similar.

(2) Long-Run Aftermarket Performance of IPOs

The evidence that IPOs exhibit long-run underperformance in aftermarket has been broadly documented by prior studies (Aggarwal and Rivoli, 1990; Ritter, 1991; Levis, 1993; Espenlaub, Gregory, and Tonks, 2000; Carter, Dark and Singh, 1998). For example, Levis (1993) find the accumulative average adjusted returns (excluding initial returns) for 712 IPOs issued on LSE over 1980-1988 is -22.96% in a 3-years period. Prior studies provide several potential explanations for the anomaly of IPO's long-run aftermarket performance directly and indirectly. Ritter (1991) mainly suggest that investors tend to overvalue young growth companies, and that firms time new issues due to the fads in IPO market. Jain and Kini (1994) find that the operating performance

Table 4-8 Abnormal Returns on Dividend Initiation Announcement of IPOs in 1996-2010

Excess returns are calculated using market model with 60-days estimation window (-90,-30) relative to dividend initiation announcement date and with FTSE All-Share Index as benchmark market portfolio. “All” represents the full sample of IPOs that initiated dividends and have complete data on stock returns and market returns; the definitions of “TYPE1”, “TYPE2”, “TYPE3” and “TYPE4” are incorporated in Section 4.3.1; TYPE2&3&4 represents the combination of TYPE2, TYPE3 and TYPE4 IPOs; TYPE3&4 represents the combination of TYPE3 and TYPE4 IPOs. For each even window and each subgroup, abnormal returns is presented in the upper row and *p*-value is presented in parentheses in the lower row. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Event Window	All	TYPE1	TYPE2	TYPE3	TYPE4	TYPE2&3&4	TYPE3&4
(-1,1)	0.0159***	0.0108	0.0363***	0.0138	0.0535	0.0287***	0.0192*
	(0.003)	(0.119)	(0.00)	(0.145)	(0.268)	(0.00)	(0.059)
(-3,3)	0.0229***	0.017**	0.0456***	0.0202	0.0758	0.0377***	0.0278*
	(0.001)	(0.048)	(0.00)	(0.214)	(0.141)	(0.00)	(0.073)
(-3,-1)	0.0065**	0.0072**	0.0042	0.0056	0.0017	0.0046	0.0050
	(0.019)	(0.039)	(0.423)	(0.475)	(0.838)	(0.272)	(0.457)
(-1,0)	0.0145***	0.0114**	0.0281***	0.0088	0.0557	0.0224***	0.0152
	(0.001)	(0.034)	(0.001)	(0.251)	(0.321)	(0.00)	(0.117)
0	0.0118***	0.0079	0.0294***	0.0051	0.0549	0.0217***	0.0119
	(0.003)	(0.114)	(0.00)	(0.502)	(0.323)	(0.00)	(0.216)
(0,1)	0.0132***	0.0073	0.0376***	0.0101	0.0528	0.028***	0.0160
	(0.009)	(0.26)	(0.00)	(0.329)	(0.27)	(0.00)	(0.14)
(1,3)	0.0046	0.0018	0.012*	0.0095	0.0192	0.0115*	0.0108
	(0.197)	(0.674)	(0.073)	(0.45)	(0.533)	(0.067)	(0.346)
N	404	289	64	44	7	115	51

of IPOs declines significantly in the aftermarket and they propose three potential explanations: the agency costs increase after IPO; issuers overstate pre-IPO performance; firms seek to issue when they experience unsustainable operating performance. Both Ritter (1991) and Jain and Kini (1994) suggest that market reaction or operating performance in the aftermarket can be attributable to information asymmetry and agency problem.

However, prior studies do not take account of the role that IPOs’ dividend policies play in long-run aftermarket performance. In this section I attempt to test two hypotheses. Type1 IPOs are expected to outperform other IPOs during the long-run aftermarket period because their specific dividend policies released enhance the informational transparency and thus reduce the possibilities that outside investors are overoptimistic over the prospect of the invested companies and that managers overstate the pre-IPO financial data at IPO stage. The finding of Carter et al. (1998) may provide an indirect insight into this issue. They find that more reputable underwriters are associated with lower underperformance over 3-year post-IPO holding period. Given information on dividends is similar to underwriter reputation in term of limiting information asymmetry and agency conflicts, my above hypothesis persists.

H21: *Over the long-run period after IPO, Type1 firms perform non-Type1* *counterparts. Similarly, Type3 firms underperform Type2 counterparts but outperform Type4 counterparts.*

Apart from Type1 firms, IPO firms need to make ongoing decisions on whether they start paying dividends from some time point at the post-IPO stage. As expressed in offering prospectuses, issuing firms tend to commence dividend payments only when the operating performance and financial status reach certain aims. The market informational efficiency enables investors to acknowledge the improvement of firms that initiate dividends and leads to stock price appreciations subsequently.

H22: *Dividend initiating IPOs tend to outperform non-dividend initiating counterparts for the groups of Type2, Type3 and Type4*[100].

In this section I first calculate the average market-adjusted return for each event month and the cumulative average benchmark-adjusted aftermarket performance using the methodology[101] proposed by Ritter (1991). Follow Ritter (1991) and Levis (1993), both estimated measures exclude the initial returns. The benchmark market portfolio used in the process is FTSE All-Share Index. According to Ritter (1991), each sampled event month comprises 21 successive trading days. The market-adjusted return for stock *i* in event month *t* is defined as:

$$ar_{it} = r_{it} - r_{mt} \qquad (4-13)$$

where r_{it} and r_{mt} represent the actual return for stock *i* in event month *t* and the market return in event month *t* respectively. The average benchmark-adjusted return for each event month *t* is computed as:

$$AR_t = \frac{1}{n}\sum_{i=1}^{n} ar_{it} \qquad (4-14)$$

and the t-statistic for AR_t is computed as:

$$t\text{-}AR_t = \frac{AR_t \times \sqrt{n_t}}{\sigma_t} \qquad (4-15)$$

Where n_t and σ_t represent the number of firms trading in event month *t* and the standard deviation of ar_{it} respectively. The cumulative average market-adjusted return for the event window between the first month and the event month is defined as:

$$CAR_t = \sum_{t=1}^{t} AR_t \qquad (4-16)$$

and the t-value for CAR_t is computed as:

[100] According our categorical standard, Type1 IPOs are all dividend payers. Thus, Type1 IPOs are absent from the contrastive analysis in this section.
[101] This method is used by Levis (1993) as well.

$$t-CAR_t=\frac{CAR_T\times\sqrt{n_t}}{\sqrt{t\times var+2\times(t-1)\times cov}} \qquad (4-17)$$

where t is the event month, *var* is the average cross-sectional variance over 36 months, and *cov* is the first-order autocovariance of the AR_t series.

Table 4-9 reports the average monthly market-adjusted returns AR_t and cumulative average market-adjusted returns CAR_t excluding the initial returns for IPOs in 1996-2010 for the 36 aftermarket months. Of 36 monthly adjusted returns, 30 are negative with 16 event months having t-statistics lower than -1.65 (significance level of 0.1). Except for the first four event months the cumulative average adjusted-returns is uniformly negative for each event month and declines to -28.34% by the end of 36 holding months, and the associated t-statistics hold at less than -2.56 from the ninth month to the thirty-sixth month. Consistent with the results reported by Ritter (1991) and Levis (1993), the decline in long-run aftermarket performance of IPOs is significant economically and statistically.

To test the first hypothesis (H21) in this section, the full sample is broken down into 6 comparable groups for which the long-run excess returns are examined. The results are reported in **Table 4-10**. First, the most pronounced result is that the cumulative average market-adjusted returns (CAR_t) for Type1 IPOs remain positive during the 36 holding months after IPO, with t-statistics for the first eleven event months are greater than 1.65. There are only 5 of 36 average market-adjusted returns (ARs) having t-statistics greater than 1.65 or less than -1.65. This result at least indicates that Type1 IPOs do not exhibit declining long-run performance. Second, CARs for the non-Type1 groups (Type2, Type3, Type4, Type2&Type3&Type4 and Type3&Type4) are significantly negative after the first several post-IPO months, similar to the result for the full sample. Third, consistent with H21, long-run performance descends orderly from Type1 to Type4 in the most of observed post-IPO months, as indicated by **Figure 4-2**. The only exception is that Type4 has higher CARs than Type2 and Type3 after the twenty-seventh event month. **Figure 4-2** also illustrates that the gaps in long-run performance between any two of non-Type1 groups are not substantially major.

To test the second hypothesis in this section (H22), I compare paying IPOs with non-paying counterparts for Type2, Type3 and Type4 respectively. The results are reported in **Table 4-11**. As same as the full sample, non-dividend initiating groups have significantly negative CARs for post-IPO 36 months. The CARs for non-dividend

Table 4-9 Long-Run Abnormal Returns on Full Sample IPOs in 1996-2000 Excluding Initial Returns

This table presents the equally weighted arithmetic average benchmark-adjusted returns (%) and cumulative returns (%) excluding the initial returns for the full sample for the 36 months after going public. Full sample mean the aggregate of Type1, Type2, Type3 and Type4 IPOs for which the definitions are set out in section 4.3.1. Obs is the number of observations. $\mathrm{AR_t}$ is the equally weighted arithmetic average benchmark-adjusted return for each event month t. $\mathrm{CAR_t}$ is the cumulative benchmark-adjusted return at the event month t. t-$\mathrm{AR_t}$ is the *t*-statistic for $\mathrm{AR_t}$. and t-$\mathrm{CAR_t}$ is the t-statistic for $\mathrm{CAR_t}$. The *t*-values with absolute value of greater than 1.65 (significance level of 10%) are highlighted by using bold and italic numbers.

Full Sample					
Month	Obs	AR_t	t-AR_t	$\mathrm{CAR_t}$	t-CAR_t
1	932	0.86	1.60	0.86	1.37
2	932	-0.08	-0.16	0.79	0.88
3	932	-0.27	-0.53	0.52	0.48
4	932	-0.31	-0.59	0.21	0.17
5	932	-0.87	***-1.81***	-0.66	-0.47
6	931	-1.11	***-1.93***	-1.78	-1.15
7	930	-0.43	-0.76	-2.20	-1.32
8	930	-0.38	-0.73	-2.59	-1.45
9	930	-2.31	***-4.34***	-4.90	***-2.59***
10	930	-1.08	***-2.09***	-5.98	***-2.99***
11	929	-2.21	***-4.27***	-8.19	***-3.91***
12	927	-2.34	***-4.48***	-10.53	***-4.80***
13	927	-3.00	***-5.65***	-13.53	***-5.93***
14	925	-1.02	***-1.84***	-14.55	***-6.14***
15	922	-1.61	***-3.01***	-16.16	***-6.58***
16	921	-1.28	***-2.42***	-17.44	***-6.87***
17	920	-1.32	***-2.17***	-18.76	***-7.17***
18	915	-1.68	***-2.93***	-20.45	***-7.57***
19	914	-0.77	-1.32	-21.22	***-7.64***
20	909	-1.81	***-3.05***	-23.03	***-8.06***
21	895	-1.08	***-1.69***	-24.11	***-8.17***
22	888	-0.74	-1.18	-24.85	***-8.20***
23	877	-1.30	***-2.15***	-26.14	***-8.38***
24	873	-2.20	***-3.79***	-28.34	***-8.88***
25	862	-1.16	-1.64	-29.50	***-9.00***
26	854	1.16	0.87	-28.34	***-8.44***
27	847	-0.39	-0.46	-28.74	***-8.36***
28	842	-0.59	-0.88	-29.33	***-8.35***
29	837	-0.91	-1.36	-30.23	***-8.43***
30	824	-0.56	-0.79	-30.80	***-8.38***
31	821	-0.29	-0.38	-31.09	***-8.31***
32	815	0.50	0.59	-30.59	***-8.02***
33	811	0.11	0.15	-30.48	***-7.85***
34	802	1.56	1.97	-28.93	***-7.30***
35	797	-0.21	-0.30	-29.13	***-7.22***
36	788	0.89	1.17	-28.24	***-6.86***

initiating groups in Type2, Type3 and Type4 at the end of 36 months are -62.95%, -67.39% and -34.34% respectively with the most of CARs having statistics of lower than -1.65. In contrast, CARs for dividend paying groups remain at higher levels during 3 post-IPO years as illustrated by **Figure 4-3**. CARs for dividend-initiating groups in Type2, Type3 and Type4 at the end of 36 months are -14.67%, -0.22% and 12.43% respectively. However, the most of associated t-statistics for dividend-initiating groups are higher than -1.65. The overall results drawn from this test indicate that non-dividend initiating firms rather than dividend-initiating ones account for the decline in long-run underperformance, in line with the second hypothesis in this section (H22). However, these results do not provide direct evidence in support of signaling hypotheses because it is not clear if dividend initiations precede the stock price appreciations.

Table 4-10 Long-Run Abnormal Returns on IPOs in Contrastive Groups of IPOs in 1996-2000, Excluding Initial Returns

This table presents the equally weighted arithmetic average benchmark-adjusted returns (%) and cumulative returns (%) excluding the initial returns for various contrastive groups for the 36 months after going public. The definitions of Type1, Type2, Type3 and Type4 IPOs are set out in section 4.3.1. "Type2&Type3&Type4" is a combined group, which consists of Type2, Type3 and Type4. Similarly, "Type3&Type4" is a combined group, which consists of Type3 and Type4. Obs is the number of observations. AR_t is the equally weighted arithmetic average benchmark-adjusted return for each event month t. CAR_t is the cumulative benchmark-adjusted return at the event month t. t-AR_t is the t-statistic for AR_t. and t-CAR_t is the t-statistic for CAR_t. *t*-values with absolute value of greater than 1.65 (significance level of 10%) are highlighted by using bold and italic numbers.

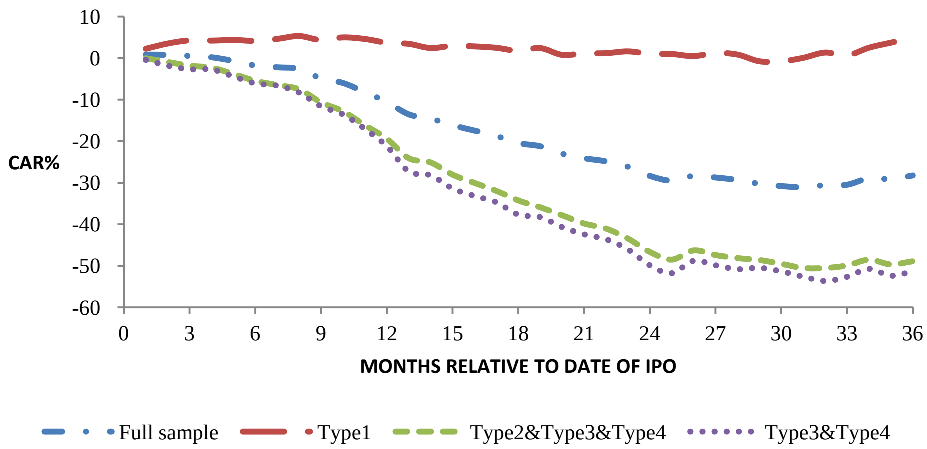
Month	Type1					Type2					Type3				
	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t
1	357	2.27	***3.81***	2.27	***2.78***	153	1.04	0.73	1.04	0.76	320	-1.19	-1.21	-1.19	-1.00
2	357	1.24	***2.32***	3.52	***3.04***	153	0.52	0.56	1.56	0.81	320	-1.60	-1.51	-2.80	***-1.65***
3	357	0.77	1.27	4.29	***3.03***	153	-1.05	-0.98	0.52	0.22	320	-0.33	-0.31	-3.13	-1.51
4	357	-0.07	-0.11	4.22	***2.58***	153	-1.66	***-1.69***	-1.15	-0.42	320	0.19	0.16	-2.94	-1.23
5	357	0.16	0.24	4.39	***2.40***	153	-1.07	-1.06	-2.21	-0.73	320	-0.25	-0.26	-3.19	-1.19
6	357	-0.23	-0.40	4.15	***2.07***	153	-1.55	-1.44	-3.77	-1.13	319	-1.30	-0.94	-4.49	-1.53
7	356	0.48	0.63	4.63	***2.14***	153	-2.27	***-2.48***	-6.04	***-1.67***	319	-1.09	-0.94	-5.58	***-1.76***
8	356	0.69	0.96	5.32	***2.30***	153	0.72	0.57	-5.32	-1.38	319	-0.90	-0.86	-6.48	***-1.91***
9	356	-0.97	-1.25	4.35	***1.77***	153	-2.76	***-2.28***	-8.08	***-1.97***	319	-2.93	***-2.88***	-9.41	***-2.61***
10	356	0.64	0.91	4.99	***1.93***	153	-2.66	***-1.83***	-10.74	***-2.49***	319	-2.08	***-2.18***	-11.49	***-3.03***
11	356	-0.38	-0.53	4.61	***1.70***	153	-2.94	***-2.48***	-13.68	***-3.02***	318	-3.20	***-3.14***	-14.69	***-3.68***
12	355	-0.89	-1.48	3.72	1.31	152	-0.67	-0.52	-14.35	***-3.02***	318	-4.70	***-4.64***	-19.39	***-4.65***
13	355	-0.27	-0.41	3.45	1.17	152	-0.91	-0.63	-15.26	***-3.09***	318	-5.84	***-5.79***	-25.23	***-5.82***
14	353	-1.00	-1.44	2.45	0.79	152	-1.30	-1.20	-16.56	***-3.23***	318	-1.77	-1.56	-27.00	***-6.00***
15	353	0.53	0.74	2.98	0.93	152	-2.26	***-1.69***	-18.82	***-3.55***	316	-3.20	***-3.09***	-30.20	***-6.46***
16	352	-0.14	-0.20	2.83	0.86	152	-2.50	***-2.00***	-21.33	***-3.89***	316	-2.24	***-2.19***	-32.44	***-6.72***
17	352	-0.34	-0.39	2.49	0.73	152	-3.00	***-2.74***	-24.33	***-4.31***	316	-1.92	-1.58	-34.36	***-6.91***
18	351	-0.71	-0.98	1.79	0.51	151	-0.42	-0.30	-24.75	***-4.24***	313	-3.24	***-2.78***	-37.60	***-7.31***
19	350	0.64	0.87	2.43	0.68	151	-4.61	***-4.24***	-29.35	***-4.90***	313	-0.31	-0.23	-37.91	***-7.17***
20	349	-1.63	***-2.10***	0.80	0.22	149	-0.53	-0.40	-29.88	***-4.83***	313	-2.40	***-1.95***	-40.31	***-7.43***
21	343	0.37	0.45	1.17	0.31	148	-2.64	***-2.14***	-32.52	***-5.11***	307	-1.80	-1.29	-42.11	***-7.51***
22	342	0.03	0.05	1.20	0.31	146	-1.33	-0.93	-33.86	***-5.16***	303	-0.83	-0.63	-42.94	***-7.43***
23	340	0.43	0.45	1.64	0.41	143	-2.24	***-1.96***	-36.09	***-5.33***	299	-2.18	***-1.95***	-45.12	***-7.58***
24	338	-0.59	-0.75	1.05	0.25	143	-1.53	-1.09	-37.63	***-5.44***	299	-3.87	***-3.37***	-48.99	***-8.06***
25	333	-0.04	-0.04	1.01	0.24	141	-1.77	-1.40	-39.40	***-5.54***	295	-1.90	-1.35	-50.89	***-8.15***
26	332	-0.50	-0.63	0.50	0.12	139	0.12	0.07	-39.28	***-5.38***	292	-0.18	-0.10	-51.08	***-7.98***
27	332	0.74	0.43	1.24	0.28	138	-1.28	-1.18	-40.56	***-5.43***	287	-1.40	-1.06	-52.48	***-7.98***
28	331	-0.37	-0.43	0.88	0.19	137	-0.19	-0.12	-40.76	***-5.34***	284	-0.34	-0.24	-52.82	***-7.84***
29	328	-1.61	***-1.86***	-0.74	-0.16	137	-2.56	***-1.93***	-43.32	***-5.57***	282	-0.98	-0.79	-53.80	***-7.82***
30	322	-0.02	-0.01	-0.75	-0.16	134	-1.07	-0.73	-44.39	***-5.55***	278	0.22	0.16	-53.58	***-7.60***
31	320	0.83	0.75	0.08	0.02	134	-0.30	-0.20	-44.69	***-5.50***	278	-2.81	***-2.45***	-56.39	***-7.87***
32	318	1.27	1.36	1.35	0.28	134	2.83	0.95	-41.85	***-5.07***	275	-0.92	-0.59	-57.31	***-7.83***
33	316	-0.67	-0.77	0.68	0.14	134	-0.44	-0.24	-42.29	***-5.05***	273	-0.91	-0.71	-58.22	***-7.81***
34	311	1.83	***1.67***	2.51	0.49	134	-0.06	-0.04	-42.35	***-4.98***	270	1.96	1.15	-56.25	***-7.39***
35	311	1.21	1.34	3.73	0.72	134	0.32	0.19	-42.04	***-4.87***	267	-2.36	-1.74	-58.61	***-7.55***
36	309	1.11	1.07	4.84	0.92	131	-0.08	-0.04	-42.11	***-4.76***	264	0.96	0.64	-57.64	***-7.28***

Month	Type4					Type2&Type3&Type4					Type3&Type4				
	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t
1	102	2.11	0.89	2.11	0.82	575	-0.01	-0.02	-0.01	-0.01	422	-0.39	-0.42	-0.39	-0.36
2	102	-0.81	-0.54	1.30	0.36	575	-0.90	-1.29	-0.91	-0.72	422	-1.41	-1.60	-1.81	-1.16
3	102	-2.50	-1.47	-1.20	-0.27	575	-0.91	-1.25	-1.82	-1.18	422	-0.86	-0.94	-2.66	-1.39
4	102	-0.71	-0.35	-1.92	-0.37	575	-0.47	-0.60	-2.28	-1.29	422	-0.03	-0.03	-2.69	-1.22
5	102	-6.19	***-4.33***	-8.11	-1.40	575	-1.52	***-2.34***	-3.80	***-1.92***	422	-1.68	***-2.08***	-4.38	***-1.77***
6	102	-2.94	***-2.07***	-11.04	***-1.75***	574	-1.66	***-1.92***	-5.46	***-2.51***	421	-1.70	-1.53	-6.07	***-2.25***
7	102	1.26	0.65	-9.79	-1.43	574	-0.99	-1.28	-6.45	***-2.74***	421	-0.52	-0.52	-6.60	***-2.26***
8	102	-4.15	***-2.70***	-13.94	***-1.91***	574	-1.05	-1.43	-7.50	***-2.98***	421	-1.69	***-1.92***	-8.28	***-2.65***
9	102	-4.40	***-2.64***	-18.34	***-2.37***	574	-3.15	***-4.41***	-10.64	***-3.99***	421	-3.29	***-3.78***	-11.57	***-3.49***
10	102	-1.59	-1.04	-19.93	***-2.44***	574	-2.14	***-3.03***	-12.79	***-4.55***	421	-1.96	***-2.42***	-13.53	***-3.87***
11	102	-4.43	***-2.69***	-24.36	***-2.85***	573	-3.35	***-4.72***	-16.14	***-5.47***	420	-3.50	***-4.03***	-17.03	***-4.64***
12	102	-2.45	-1.20	-26.81	***-3.00***	572	-3.23	***-4.27***	-19.37	***-6.28***	420	-4.16	***-4.55***	-21.19	***-5.53***
13	102	-6.81	***-3.80***	-33.63	***-3.61***	572	-4.70	***-6.24***	-24.07	***-7.50***	420	-6.07	***-6.92***	-27.26	***-6.84***
14	102	1.65	0.80	-31.97	***-3.31***	572	-1.03	-1.31	-25.10	***-7.54***	420	-0.94	-0.94	-28.20	***-6.82***
15	101	-3.11	***-1.87***	-35.08	***-3.49***	569	-2.93	***-3.98***	-28.04	***-8.11***	417	-3.18	***-3.61***	-31.38	***-7.30***
16	101	-0.42	-0.24	-35.50	***-3.42***	569	-1.99	***-2.72***	-30.03	***-8.41***	417	-1.80	***-2.03***	-33.18	***-7.47***
17	100	-0.30	-0.15	-35.80	***-3.33***	568	-1.92	***-2.35***	-31.95	***-8.68***	416	-1.53	-1.47	-34.71	***-7.58***
18	100	-2.16	-1.14	-37.95	***-3.43***	564	-2.29	***-2.81***	-34.24	***-9.01***	413	-2.98	***-3.00***	-37.69	***-7.97***
19	100	-1.41	-0.96	-39.37	***-3.46***	564	-1.66	***-1.99***	-35.90	***-9.19***	413	-0.58	-0.54	-38.26	***-7.87***
20	98	-2.48	-1.44	-41.85	***-3.55***	560	-1.92	***-2.31***	-37.82	***-9.40***	411	-2.42	***-2.37***	-40.68	***-8.14***
21	97	-1.55	-0.86	-43.40	***-3.58***	552	-1.98	***-2.20***	-39.80	***-9.59***	404	-1.74	-1.52	-42.42	***-8.21***
22	97	-2.28	-1.04	-45.69	***-3.68***	546	-1.22	-1.34	-41.02	***-9.60***	400	-1.18	-1.04	-43.60	***-8.20***
23	95	-3.29	-1.67	-48.98	***-3.82***	537	-2.39	***-3.09***	-43.41	***-9.86***	394	-2.45	***-2.52***	-46.05	***-8.41***
24	93	-3.70	***-2.15***	-52.67	***-3.98***	535	-3.22	***-4.02***	-46.63	***-10.34***	392	-3.83	***-3.97***	-49.88	***-8.90***
25	93	-1.91	-0.81	-54.58	***-4.04***	529	-1.87	***-1.97***	-48.50	***-10.48***	388	-1.90	-1.58	-51.79	***-9.00***
26	91	13.13	1.26	-41.45	***-2.98***	522	2.22	1.04	-46.28	***-9.74***	383	2.98	1.05	-48.81	***-8.27***
27	90	0.02	0.01	-41.44	***-2.90***	515	-1.12	-1.27	-47.40	***-9.73***	377	-1.06	-0.93	-49.87	***-8.22***
28	90	-2.79	-1.51	-44.23	***-3.04***	511	-0.73	-0.77	-48.13	***-9.66***	374	-0.93	-0.80	-50.80	***-8.19***
29	90	4.40	1.46	-39.83	***-2.69***	509	-0.46	-0.48	-48.59	***-9.57***	372	0.32	0.27	-50.48	***-7.98***
30	90	-4.19	***-1.74***	-44.02	***-2.92***	502	-0.91	-0.95	-49.50	***-9.52***	368	-0.86	-0.71	-51.34	***-7.93***
31	89	3.55	0.91	-40.47	***-2.63***	501	-1.01	-0.98	-50.51	***-9.54***	367	-1.26	-0.98	-52.60	***-7.99***
32	88	-1.46	-0.65	-41.92	***-2.67***	497	0.00	0.00	-50.51	***-9.35***	363	-1.05	-0.81	-53.65	***-7.97***
33	88	6.90	***2.06***	-35.02	***-2.19***	495	0.61	0.58	-49.91	***-9.08***	361	0.99	0.78	-52.66	***-7.68***
34	87	1.80	0.92	-33.23	***-2.04***	491	1.38	1.27	-48.52	***-8.66***	357	1.92	1.40	-50.74	***-7.25***
35	85	0.53	0.21	-32.70	***-1.95***	486	-1.11	-1.14	-49.64	***-8.69***	352	-1.66	-1.39	-52.40	***-7.33***
36	84	1.36	0.59	-31.34	***-1.84***	479	0.75	0.71	-48.89	***-8.38***	348	1.06	0.84	-51.34	***-7.04***

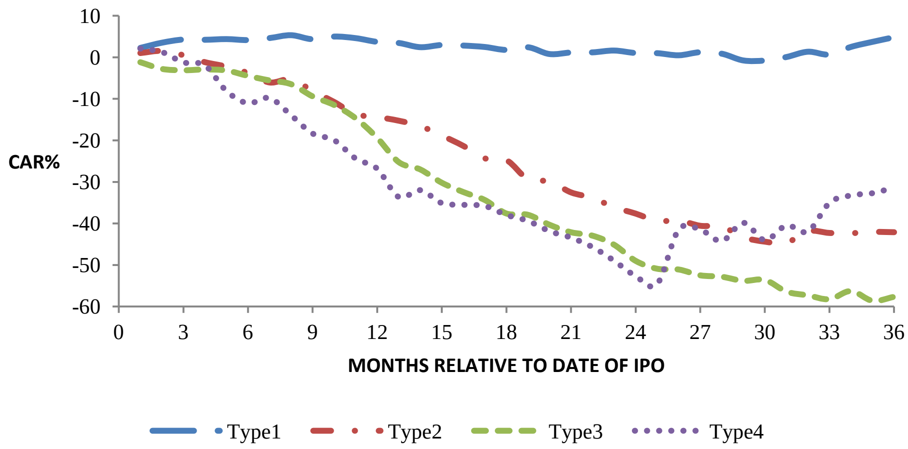
Figure 4-2 Cumulative Average Adjusted Returns (%) on IPOs in Contrastive Groups of IPOs in 1996-2010, Excluding Initial Returns

The figures are based on the results reported in Table 4-9 and Table 4-10. Full sample mean the aggregate of Type1, Type2, Type3 and Type4 IPOs for which the definitions are set out in section 4.3.1. "Type2&Type3&Type4" is a combined group, which consists of Type2, Type3 and Type4. Similarly, "Type3&Type4" is a combined group, which consists of Type3 and Type4.

A. Full Sample, Type1, Type2&Type3&Type4 and Type3&Type4 IPOs, 1996-2000



B. Type1, Type2, Type3 and Type4 IPOs, 1996-2000



I then calculate the wealth relatives (WR) as the alternative performance measure using the original method of Ritter (1991). This measure compares the wealth of sample IPOs relative to that of benchmark market by following a buy and hold strategy. In analysis, IPOs that were not held for 36 months are dropped. 3-year holding period returns for firm *i* (R_i) is computed as:

$$R_i = \prod_{t=1}^{36} r_{it} - 1 \qquad (4-18)$$

where r_{it} represents the return on firm *i* in event month *t*.

Table 4-11 Long-Run Abnormal Returns on IPOs in Dividend-Paying and Non-Dividend Paying Groups of IPOs in 1996-2010, Excluding Initial Returns

This table presents the equally weighted arithmetic average benchmark-adjusted returns (%) and cumulative returns (%), excluding the initial returns, for dividend-paying and Non-dividend paying IPOs belonging to Type2, Type3 and Type4 respectively. The definitions of Type2, Type3 and Type4 IPOs are set out in section 4.3.1. Obs is the number of observations. AR_t is the equally weighted arithmetic average benchmark-adjusted return for each event month t. CAR_t is the cumulative benchmark-adjusted return at the event month t. t-AR_t is the t-statistic for AR_t. and t-CAR_t is the t-statistic for CAR_t. *t*-values with absolute value of greater than 1.65 (significance level of 10%) are highlighted by using bold and italic numbers.

Month	Type2-Pay					Type2-Nonpay				
	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t
1	66	2.74	***1.77***	2.74	1.64	87	-0.25	-0.11	-0.25	-0.12
2	66	2.15	1.51	4.89	***2.07***	87	-0.71	-0.57	-0.96	-0.33
3	66	-0.09	-0.08	4.79	***1.66***	87	-1.77	-1.07	-2.73	-0.76
4	66	-1.28	-0.94	3.51	1.05	87	-1.96	-1.40	-4.69	-1.13
5	66	0.10	0.08	3.62	0.97	87	-1.95	-1.38	-6.64	-1.44
6	66	-1.18	-0.97	2.44	0.60	87	-1.84	-1.11	-8.48	***-1.68***
7	66	-1.30	-0.98	1.14	0.26	87	-3.01	***-2.39***	-11.49	***-2.10***
8	66	0.95	0.67	2.09	0.44	87	0.55	0.28	-10.94	***-1.87***
9	66	0.32	0.21	2.41	0.48	87	-5.09	***-2.88***	-16.04	***-2.59***
10	66	-1.41	-0.96	1.00	0.19	87	-3.61	-1.56	-19.65	***-3.01***
11	66	0.96	0.55	1.97	0.36	87	-5.90	***-3.80***	-25.55	***-3.73***
12	66	0.49	0.29	2.46	0.43	86	-1.57	-0.83	-27.11	***-3.77***
13	66	1.84	1.05	4.30	0.71	86	-3.01	-1.43	-30.13	***-4.02***
14	66	-0.58	-0.43	3.72	0.60	86	-1.86	-1.14	-31.99	***-4.11***
15	66	-2.20	-1.24	1.52	0.24	86	-2.31	-1.19	-34.30	***-4.26***
16	66	-1.54	-0.94	-0.01	0.00	86	-3.25	***-1.78***	-37.55	***-4.52***
17	66	-2.35	-1.58	-2.37	-0.34	86	-3.50	***-2.23***	-41.05	***-4.79***
18	66	1.39	0.85	-0.98	-0.14	85	-1.82	-0.88	-42.86	***-4.83***
19	66	-3.86	***-2.80***	-4.84	-0.66	85	-5.19	***-3.22***	-48.06	***-5.28***
20	65	-0.42	-0.21	-5.25	-0.70	84	-0.62	-0.34	-48.68	***-5.18***
21	65	-2.19	-1.38	-7.44	-0.97	83	-2.99	-1.63	-51.67	***-5.33***
22	65	3.54	1.52	-3.90	-0.49	81	-5.24	***-3.12***	-56.91	***-5.67***
23	65	-1.86	-1.40	-5.77	-0.72	78	-2.55	-1.43	-59.46	***-5.68***
24	65	-1.66	-0.83	-7.43	-0.90	78	-1.43	-0.72	-60.89	***-5.70***
25	65	-0.41	-0.26	-7.84	-0.93	76	-2.94	-1.52	-63.82	***-5.78***
26	65	-0.08	-0.04	-7.92	-0.92	74	0.30	0.10	-63.52	***-5.56***
27	65	-1.04	-0.73	-8.97	-1.03	73	-1.50	-0.93	-65.02	***-5.55***
28	65	-1.25	-0.97	-10.21	-1.15	72	0.76	0.27	-64.26	***-5.35***
29	65	0.78	0.48	-9.44	-1.04	72	-5.58	***-2.77***	-69.84	***-5.71***
30	63	-0.53	-0.26	-9.97	-1.07	71	-1.54	-0.74	-71.38	***-5.70***
31	63	-0.99	-0.47	-10.95	-1.15	71	0.31	0.15	-71.07	***-5.58***
32	63	-1.06	-0.56	-12.01	-1.24	71	6.29	1.18	-64.78	***-5.01***
33	63	-1.62	-1.13	-13.63	-1.39	71	0.61	0.19	-64.18	***-4.89***
34	63	-1.02	-0.41	-14.65	-1.47	71	0.80	0.40	-63.38	***-4.75***
35	63	-0.82	-0.39	-15.47	-1.53	71	1.32	0.51	-62.06	***-4.59***
36	63	0.80	0.38	-14.67	-1.43	68	-0.88	-0.28	-62.95	***-4.49***

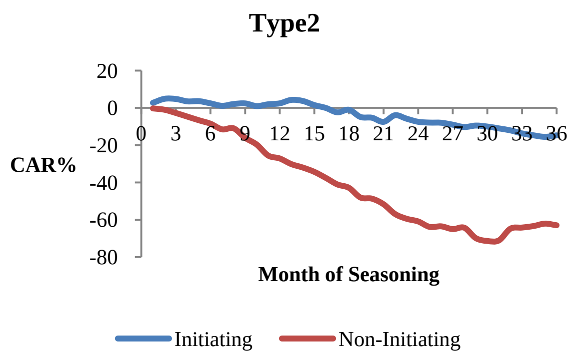
Month	Type3-Pay					Type3-Nonpay				
	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t
1	44	-0.89	-0.46	-0.89	-0.30	276	-1.24	-1.13	-1.24	-0.95
2	44	4.25	***2.05***	3.35	0.80	276	-2.54	***-2.16***	-3.78	***-2.04***
3	44	3.80	1.04	7.15	1.39	276	-0.99	-0.91	-4.77	***-2.11***
4	44	0.57	0.33	7.73	1.30	276	0.12	0.10	-4.64	***-1.78***
5	44	3.36	1.54	11.09	***1.66***	276	-0.82	-0.79	-5.46	***-1.87***
6	44	3.28	0.95	14.37	***1.97***	275	-2.04	-1.34	-7.50	***-2.34***
7	44	-1.96	-0.84	12.40	1.57	275	-0.95	-0.74	-8.45	***-2.44***
8	44	-0.98	-0.42	11.42	1.35	275	-0.89	-0.76	-9.34	***-2.52***
9	44	1.51	0.53	12.93	1.44	275	-3.64	***-3.36***	-12.98	***-3.30***
10	44	1.69	0.68	14.62	1.55	275	-2.68	***-2.61***	-15.66	***-3.78***
11	44	-0.08	-0.03	14.54	1.47	274	-3.70	***-3.32***	-19.36	***-4.45***
12	44	-8.74	***-2.99***	5.80	0.56	274	-4.06	***-3.77***	-23.42	***-5.15***
13	44	-6.50	***-2.43***	-0.70	-0.06	274	-5.73	***-5.25***	-29.15	***-6.16***
14	44	2.87	0.60	2.17	0.19	274	-2.51	***-2.34***	-31.66	***-6.45***
15	44	-1.98	-0.86	0.19	0.02	272	-3.39	***-2.97***	-35.06	***-6.87***
16	44	-2.83	-1.09	-2.64	-0.22	272	-2.15	***-1.92***	-37.20	***-7.06***
17	44	-6.54	***-2.59***	-9.18	-0.75	272	-1.17	-0.87	-38.38	***-7.07***
18	44	0.14	0.05	-9.04	-0.71	269	-3.80	***-2.98***	-42.17	***-7.51***
19	44	2.70	0.79	-6.34	-0.49	269	-0.80	-0.56	-42.97	***-7.44***
20	44	-0.63	-0.18	-6.97	-0.52	269	-2.69	***-2.05***	-45.66	***-7.71***
21	44	-2.32	-0.89	-9.29	-0.68	263	-1.71	-1.09	-47.37	***-7.72***
22	43	-3.44	-1.20	-12.73	-0.90	260	-0.39	-0.27	-47.77	***-7.56***
23	43	-4.45	-1.39	-17.18	-1.19	256	-1.80	-1.51	-49.57	***-7.61***
24	43	1.45	0.40	-15.73	-1.06	256	-4.77	***-4.01***	-54.34	***-8.17***
25	43	-0.54	-0.10	-16.26	-1.08	252	-2.13	-1.57	-56.47	***-8.25***
26	43	-3.53	***-1.72***	-19.79	-1.28	249	0.39	0.19	-56.08	***-7.99***
27	43	1.61	0.44	-18.18	-1.16	244	-1.93	-1.36	-58.01	***-8.03***
28	43	7.26	***2.45***	-10.93	-0.68	241	-1.70	-1.07	-59.70	***-8.06***
29	43	0.39	0.16	-10.54	-0.65	239	-1.23	-0.88	-60.94	***-8.05***
30	43	7.02	***1.81***	-3.52	-0.21	235	-1.02	-0.70	-61.96	***-7.98***
31	43	1.11	0.42	-2.41	-0.14	235	-3.52	***-2.79***	-65.48	***-8.30***
32	43	1.90	0.75	-0.50	-0.03	232	-1.44	-0.80	-66.92	***-8.30***
33	43	-2.14	-1.08	-2.64	-0.15	230	-0.68	-0.46	-67.60	***-8.22***
34	43	4.25	1.40	1.61	0.09	227	1.53	0.79	-66.08	***-7.86***
35	43	0.07	0.02	1.69	0.09	224	-2.82	***-1.88***	-68.90	***-8.02***
36	42	-1.91	-0.74	-0.22	-0.01	222	1.51	0.88	-67.39	***-7.70***

Month	Type4-Pay					Type4-Nonpay				
	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t	Obs	AR_t	t-AR_t	CAR_t	t-CAR_t
1	7	6.95	1.02	6.95	1.42	95	1.76	0.70	1.76	0.64
2	7	4.95	1.03	11.89	1.74	95	-1.24	-0.79	0.52	0.13
3	7	10.41	***2.12***	22.31	***2.68***	95	-3.46	***-1.97***	-2.94	-0.62
4	7	-3.46	-1.11	18.85	***1.97***	95	-0.51	-0.24	-3.45	-0.63
5	7	-1.16	-0.24	17.70	***1.66***	95	-6.56	***-4.40***	-10.01	-1.62
6	7	-1.74	-1.10	15.95	1.36	95	-3.03	***-1.99***	-13.03	***-1.93***
7	7	-4.01	***-1.68***	11.94	0.95	95	1.65	0.80	-11.39	-1.56
8	7	-9.30	***-2.18***	2.64	0.20	95	-3.77	***-2.33***	-15.16	***-1.94***
9	7	-4.22	-0.34	-1.58	-0.11	95	-4.41	***-2.82***	-19.57	***-2.37***
10	7	9.26	***3.51***	7.69	0.51	95	-2.39	-1.50	-21.96	***-2.52***
11	7	-3.33	-0.82	4.35	0.28	95	-4.52	***-2.59***	-26.48	***-2.90***
12	7	10.69	0.91	15.04	0.91	95	-3.42	***-1.71***	-29.90	***-3.13***
13	7	-7.47	***-2.21***	7.57	0.44	95	-6.76	***-3.54***	-36.66	***-3.69***
14	7	-2.55	***-1.69***	5.02	0.28	95	1.96	0.89	-34.70	***-3.36***
15	7	-3.93	-0.67	1.09	0.06	94	-3.05	***-1.75***	-37.75	***-3.52***
16	7	6.59	0.92	7.68	0.40	94	-0.94	-0.52	-38.69	***-3.49***
17	7	0.33	0.08	8.00	0.41	93	-0.34	-0.16	-39.03	***-3.40***
18	7	3.48	0.42	11.49	0.57	93	-2.58	-1.33	-41.61	***-3.52***
19	7	-0.31	-0.11	11.18	0.54	93	-1.50	-0.95	-43.11	***-3.55***
20	7	0.83	0.23	12.01	0.56	91	-2.74	-1.49	-45.85	***-3.64***
21	7	7.88	1.53	19.89	0.91	90	-2.29	-1.21	-48.13	***-3.71***
22	7	-1.39	-0.70	18.50	0.83	90	-2.35	-0.99	-50.49	***-3.80***
23	7	-2.85	-0.79	15.66	0.69	88	-3.32	-1.57	-53.81	***-3.92***
24	7	-0.39	-0.18	15.27	0.66	86	-3.97	***-2.15***	-57.78	***-4.07***
25	7	-2.42	-1.49	12.86	0.54	86	-1.87	-0.73	-59.65	***-4.12***
26	7	11.11	***2.08***	23.97	0.99	84	13.30	1.18	-46.35	***-3.10***
27	7	-5.01	***-2.36***	18.96	0.77	83	0.44	0.18	-45.91	***-3.00***
28	7	0.20	0.10	19.15	0.76	83	-3.04	-1.53	-48.95	***-3.14***
29	7	-2.13	-0.49	17.02	0.66	83	4.96	1.53	-44.00	***-2.77***
30	7	-2.46	-1.35	14.56	0.56	83	-4.34	-1.66	-48.34	***-2.99***
31	7	0.11	0.02	14.67	0.55	82	3.85	0.91	-44.49	***-2.69***
32	7	2.94	0.79	17.61	0.65	81	-1.84	-0.76	-46.33	***-2.74***
33	7	-3.53	-1.14	14.08	0.52	81	7.80	***2.16***	-38.53	***-2.25***
34	7	7.18	1.63	21.26	0.77	80	1.32	0.64	-37.20	***-2.12***
35	7	-3.23	-1.57	18.03	0.64	78	0.87	0.31	-36.33	***-2.02***
36	7	-5.60	***-2.04***	12.43	0.44	77	1.99	0.80	-34.34	***-1.87***

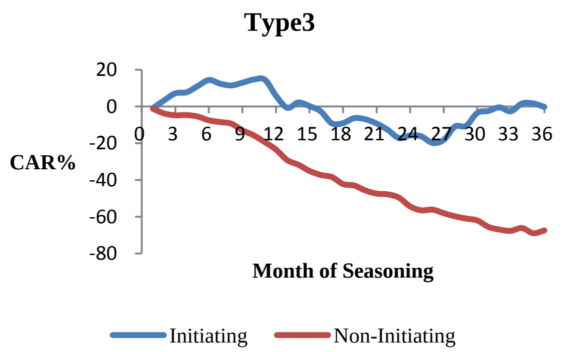
Figure 4-3 Long-Run Abnormal Returns on IPOs in Dividend-Initiating and Non-Dividend Initiating Groups of IPOs in 1996-2000, Excluding Initial Returns

The figures illustrate the CARs for dividend initiating and non-dividend initiating groups over 36 post-IPO months and are based on the results reported in Table 4-11. The definitions of Type2, Type3 and Type4 IPOs are set out in section 4.3.1.

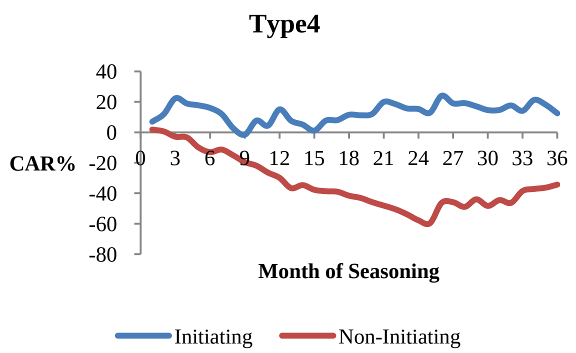
A. Type2



B. Type3



C. Type4



The wealth relative on the sample IPOs is computed as:

$$WR = \frac{1+\frac{1}{n}\sum_{i=1}^{n} R_i}{1+\prod_{t=1}^{36} r_{mt}} \qquad (4-19)$$

Where r_{mt} represents the benchmark market return in event month t. A wealth relative of less than 1.00 indicates that the sampled IPOs underperformed the FTSE All-Share Index during 36 months in aftermarket. Accordingly, a wealth relative of greater than 1.00 indicates that the sampled IPOs outperform the FTSE All-Share Index.

Table 4-12, Panel A. shows that the wealth relative (WR) of Type1 IPOs is 1.19, indicating that Type1 IPOs have higher three-year holding period returns (TYHR) relative to the market. The WR of 0.96 of "Full Sample" means that the performance of all IPOs is close to that of the benchmark market when using TYHR as a measure. By contrast the values of TYHR for the remaining subgroups concentrate in the range of 0.75-0.81. In general Type1 IPOs outperform the market, in line with the results using CAR as measure of long-run performance.

Table 4-12, Panel B. shows that WRs of dividend initiating groups are universally greater than those of non-dividend initiating counterparts, also consistent with the results using CAR to measure long-run performance. Therefore, the overall results support the two hypotheses (H21 and H22) in this section.

Table 4-12 Three-Year Holding Period Returns for Contrastive Groups

The definitions of Type2, Type3 and Type4 IPOs are set out in section 4.3.1. "Obs" is the number of observations. Raw Return ($\frac{1}{n}\sum_{i=1}^{n} R_i$) is the average 3-year holding return for each IPO group. FTSE is the 3-year holding return for FTSE-All Share index over the same period. WR is the wealth relative, which is based on equation (4-20).

Panel A.				
Type	Obs	Raw Return	FTSE	WR
Type1	309	0.40	0.17	1.19
Type2	131	-0.18	0.04	0.79
Type3	264	-0.16	0.03	0.81
Type4	84	-0.16	0.12	0.75
Type2&Type3&Type4	479	-0.17	0.05	0.79
Type3&Type4	348	-0.16	0.05	0.80
Full Sample	788	0.05	0.10	0.96
Panel B.				
Type2pay	63	0.19	0.08	1.10
Type2nonpay	68	-0.53	0.00	0.47
Type3pay	42	-0.11	0.01	0.89
Type3nonpay	222	-0.17	0.03	0.80
Type4pay	7	0.28	0.28	1.00
Type4nonpay	77	-0.20	0.11	0.72

4.5 Findings and Conclusions

In this chapter, I investigate the determinants of dividend decisions at stage of IPO basing on 932 UK IPO prospectus statements published between 1996 and 2010. In particular, I emphasize on examining the influence of the pre-IPO financial status on the dividend policies as stated in prospectuses. I develop the theoretically based testable hypotheses in the context of the main dividend theories including signaling, agency costs, life cycle and catering. All the sample firms are classified into four control groups according to the decision makers' attitudes toward dividend payment. Specifically, in offering prospectuses, Type1 firms state that they will definitely pay dividends after admission. Type2 firms state that they have intention to carry out active dividend policy depending on future operating performance. Type3 firms anticipate that they will not pay out dividends in the short or medium term. Type4 firms state that they have no intention to pay. The results show that the proportions of firms that paid dividends within 5-year post-IPO are 97.89%, 39.84%, 9.59% and 5.26% for Type1, Type2, Type3 and Type4 firms respectively. Key firm characteristics are compared between the different groups using unique categorical analyses, cross-sectional binary logistic regression and ordinal logistic regression analyses. In addition, I examine the abnormal returns on dividend initiations and long-run aftermarket performance for different types of IPOs. The main findings are as follows.

4.5.1 Asymmetric Information and Signaling

The most significant finding is that pre-IPO profitability has significant influence on IPOs' initial dividend policies as presented in prospectuses. Specifically, IPOs with active dividend policies are more profitable in terms of accounting 3-year averages (*ROA*) and accounting last fiscal year ratio (*ROA (-1Y)*), more likely to experience growth in earnings (*Gn ROA*) and to maintain positive earnings (*Positive ROA*) during pre-IPO period. All these results are strongly robust using various test methods. This finding is particularly consistent with Lintner (1956) model in which dividend policy follows the shifts in long-run sustainable earnings and managers are highly prudent to initiate dividends in order to prevent from reversing dividend changes in future. These findings are also consistent with Miller (1987), Healy and Palepus (1988) and Benartzi, Michaely and Thaler (1997) who document that there is a strong link between changes in dividend policies and past earnings. In this sense, the dividend policy presented in IPO prospectuses signal the past financial performance of firms.

The results show that lower institutional ownership (*INSTITUTION*) is associated with stronger propensity to choose relatively active dividend strategies for IPOs. According to Kale et al. (2012), IPOs tend to express an intensive willingness of paying aftermarket dividends to attract informed institutional investors who favor dividends when the current level of institutional ownership is lower than what it should be. The results also show that IPOs associated with prestigious underwriters (*REPUTATION*) are more inclined to specify active dividend policies. According to signaling explanation, prestigious underwriters provide certification for high quality IPOs who have the ability and demand to undertake high dividend payments (Allen and Faulhaber, 1989).

In contrast, the tests show that VC backing (*VC STAKE*; *VC-BACKED*) has negative associations with the incidence that IPOs determine active dividend policies. This result violates the signaling hypothesis that VC backed high quality IPOs are more likely to pay dividends. Using binary logistic regression models, I find the strong evidence that IPOs undertaking Type1 dividend policy tend to be associated with shorter lock-up restriction period (*LOCKUP CONSENT*). Using ordinal logistic regression models, I find that the possibility that IPOs undertaking active dividend policies is negatively with the aggregate locked-up shares. These results do not support the hypothesis that high quality firms tend to accept severe lock-up agreements to communicate information to new investors

Using event study I find that the cumulative abnormal returns (CARs) to dividend initiation announcements are significantly positive, in line with prior studies. I also find that CARs of Type1 IPOs are lower than those of non-Type1 counterparts. A possible explanation is that Type1 IPOs release sufficient information through dividend policies declared in offering prospectuses and therefore their formal dividend initiations fail to shock the market. Moreover, TYPE2 has the significant CARs over the major event windows. In contrast, neither TYPE3 nor TYPE4 has the statistically significant CARs. Since TYPE3 are TYPE4 firms are more likely to belong to high technology industries according to the statistics, this result might suggest that investors do not regard the dividend disbursement made by technology focused companies as good news.

Furthermore, I find that dividend-paying companies outperform non-dividend paying counterparts during 3 post-IPO years, indicating that non-dividend initiating

IPOs rather than dividend-initiating ones account for the decline in long-run underperformance. This finding is consistent with the notion that market informational efficiency enables investors to acknowledge the improvement of firms that initiate dividends and leads to stock price appreciations subsequently. However, this finding does not provide direct evidence in support of signaling hypotheses because it is not clear if dividend initiations precede the stock price appreciations.

4.5.2 Agency Costs

The results show that IPOs with higher cash flows (*CF/TA; CF/TA (-1Y)*), higher turnover ratio (*TURNOVER*), and lower capital expenditures (*CAPEX/TA*) tend to choose more active dividend policies when going public, consistent with the predictions of free cash flow hypothesis (Jensen, 1986; Lang and Litzenberger, 1989; Grullon, Michaely and Swaminathan, 2002) and residual hypothesis. Furthermore, IPOs with active dividend policies are more likely to experience growth in cash inflows (*Gn CF/TA*) and to maintain positive earnings (*Positive CF*) during pre-IPO period, intensifying above finding. But there is no evidence that leverage (*LEVERAGE*) has significantly influence on dividend decisions of issuing firms at IPO stage.

The observed negative impact of full length of lockup period (*LOCKUP CONSENT*) on the decision of choosing active dividend policy (Type1) is consistent with the substitute assumption of agency costs which suggests that lockup agreements bond the interests of managers and outside investors (Rozeff, 1982; Jensen, 1986; Smith and Watts, 1992; Gaver and Gaver, 1993; LaPorta et al., 2000; Officer, 2006). Similarly, the substitute assumption of agency costs is compatible with the findings that IPOs with VC backing (*VC STAKE*; *VC-BACKED*), high institutional ownership (*INSTITUTION*) or high level of managerial stock options (*OPTION*) tend to be conservative in stating dividend policy in prospectuses. Additionally, in line with free cash flow hypothesis and residual hypothesis, IPOs in high technological sectors (*HITECH*) or IPOs issued on *AIM* are less likely to specify active dividend policies in prospectuses. On the contrary, my results do not support for the complement assumption of agency costs which suggests that strong corporate governance accompanies higher dividend payment (LaPorta et al., 2000; Fenn and Liang, 2001; Grinstein and Michaely, 2005).

I examine the long-run excess returns of IPOs. Unlike other IPO firms, Type1 IPOs do not exhibit declining long-run performance. The cumulative average market-adjusted returns (CAR_t) for Type1 IPOs remain positive during the 36 holding months after IPO, with t-statistics for the first eleven event months are greater than 1.65. Long-run performance descends orderly from Type1 to Type4 in the most of observed post-IPO months. These findings lend support to the hypothesis that detailed dividend policies released in prospectuses enhance the informational transparency and thus reduce the possibilities that outside investors are overoptimistic over the prospect of the invested companies and that managers overstate the pre-IPO financial data at IPO stage.

4.5.3 Life-Cycle

The finding that venture-capital backed (*VC STAKE*; *VC-BACKED*) IPOs tend to declare relatively conservative dividend policies in prospectuses is consistent with the predictions of the lifecycle theory which predicts that venture capitalists prefer to invest in high growth firms (Lerner, 1994; Gompers, 1995; Bergemann and Hege, 1998; Lee and Wahal, 2004; Krishnan et al., 2011). The alternative explanation can be that venture capitalists tend to pursue capital gains from short-term investments rather than long-term dividend streams (Lerner, 1994 and Field and Hanka, 2001). Moreover, the observed negative impact of full length of lockup period (*LOCKUP CONSENT*) on the decision of choosing active dividend policy is consistent with the implications of lifecycle theory, assuming the degree of a firm's maturity has a negative relation with the severity of lock-up agreements (Brav and Gompers, 2003). Further, in accordance with Fama and French (2001) and Deshmukh (2003), larger (*LNGP*) IPOs are more progressive in choosing dividend policies at the time of IPO. Lifecycle logic provide The finding that firms operating in high technological sectors (*HITECH*) are less likely to make active dividend policies are in line with explanation because these firms are of young and high growth.

4.5.4 Catering

The empirical tests show that the evidence in the context of catering hypothesis is mixed. The coefficients of dividend premium (DP) in ordered logistic regressions are mostly negative and significant, consistent with the prediction of dividend catering theory. However, in binary logistic regressions, the coefficients of dividend premium are not significant, inconsistent with the prediction of dividend catering theory. In addition, the results show that IPOs issued in the 'internet bubble' period opt for relatively conservative dividend strategies, and IPOs issued in 2000s are less likely to adopt active dividend policies than those issued in the 1990s.

Overall, the pre-IPO financial positions appear to have important influence on IPO' initial dividend policies prior to admission. IPOs tilt toward active dividend policies when the levels of profitability and cash flows are high, increase from year to year or maintain positive in the three years prior to IPO. The empirical tests in general support lifecycle theory. There are also some evidence lending support for the signaling theory and substitution assumption of agency costs. However, the evidence on catering hypothesis is mixed.

Appendix 4-1 Abnormal Returns around Dividend Initiation Announcement

Excess returns are calculated using market model with 30-days estimation window (-60,-30) relative to dividend initiation announcement date and with FTSE All-Share Index as benchmark market portfolio. "All" represents the full sample of IPOs that initiated dividends and have complete data on stock returns and market returns; the definitions of "TYPE1", "TYPE2", "TYPE3" and "TYPE4" are incorporated in Section 4.3.1; TYPE2&3&4 represents the combination of TYPE2, TYPE3 and TYPE4 IPOs; TYPE3&4 represents the combination of TYPE3 and TYPE4 IPOs. For each even window and each subgroup, abnormal returns is presented in the upper row and p-value is presented in parentheses in the lower row. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Event Window	All	TYPE1	TYPE2	TYPE3	TYPE4	TYPE2&3&4	TYPE3&4
(-1,1)	0.0138***	0.0069	0.0328***	0.0137	0.0467	0.0264***	0.0182*
	(0.004)	(0.301)	(0.00)	(0.133)	(0.348)	(0.00)	(0.07)
(-3,3)	0.0203***	0.0132*	0.0385***	0.0213	0.0572	0.0331***	0.0262*
	(0.001)	(0.098)	(0.001)	(0.172)	(0.301)	(0.00)	(0.083)
(-3,-1)	0.0059**	0.0069**	0.0010	0.0072	-0.0074	0.0028	0.0052
	(0.019)	(0.026)	(0.839)	(0.346)	(0.299)	(0.485)	(0.435)
(-1,0)	0.013***	0.0077	0.0252***	0.0091	0.0526	0.0208***	0.0151
	(0.001)	(0.159)	(0.002)	(0.216)	(0.356)	(0.001)	(0.117)
0	0.0008	-0.3566	0.028***	0.0048	0.0542	0.0208***	0.0116
	(0.647)	(0.535)	(0.00)	(0.524)	(0.333)	(0.001)	(0.23)
(0,1)	0.0111**	0.0031	0.0355***	0.0094	0.0483	0.0265***	0.0148
	(0.016)	(0.618)	(0.00)	(0.364)	(0.321)	(0.00)	(0.174)
(1,3)	0.0042	0.0023	0.0094	0.0093	0.0104	0.0095	0.0095
	(0.204)	(0.549)	(0.147)	(0.453)	(0.745)	(0.124)	(0.407)
N	457	340	66	44	7	117	51

Chapter Five

Trends in Dividend Payments: International Evidence

5.1 Introduction

Fama and French (2001) report that the incidence of dividend payers among US firms fell from 66.5% in 1978 to 20.8% in 1999. Subsequently, a number of empirical studies concur with this finding, suggesting that the declining proportion of listed companies that pay dividends prevails among the international capital markets. Ferris, Sen and Yui (2006) observe that the percentage of the UK dividend-paying firms decreased significantly between 1988 and 2002. Denis and Osobov (2008) find that six developed countries experienced the declining percentage of dividend-paying firms between 1989 and 2002. Similarly, Eije and Megginson (2008) find that the percentage dividend-paying firms across fifteen European countries decreased between 1989 and 2005. Most recently, in their investigation basing on firms in nine common law countries, and in sixteen civil law countries, Ferris, Sen and Unlu (2009) find that there is a global decrease tendency in the percentage of dividend-paying firms between 1994 and 2007[102].

Fama and French (2001) argue that the declining percentage of dividend payers is due, in part, to the changes in the characteristics of the US exchange-listed firms. However, when they control for the typical characteristics associated with non-dividend-paying firms, the actual number of dividend payers is still less than expected. The declining propensity of paying dividends is also confirmed by Eije and Megginson

[102] Ferris et al. (2009) show that companies based in common law countries exhibit the declining tendency in dividend payment to greater extent than the counterparts based in civil law countries.

(2008) who use data that base on fifteen European countries. Ferris et al. (2009) report that the proportion of dividend-paying firms decreased in most developed countries and developing countries.[103] Denis and Osobov (2008) show that the lower propensity of paying dividends among six developed countries is merely small in scale when controlling for the determinants identified by Fama and French (2001) as well as earned equity[104], and they do not rule out the possibility that such trend is limited to newly listed firms.

However, Julio and Ikenberry (2004) put forward “reappearing dividends” statement which is grounded on the finding that the percentage of dividend-paying firms in the US increased slightly after hitting a low of 15% in 2001, as by the first half of 2004, more than 20% of US firms are again regularly paying dividends. Eije and Megginson (2008) note that in all European countries, except for in the UK, the percentage of dividend-payers increased in 2004 and in 2005. However, Ferris et al. (2009) show that the phenomenon of the recovery in the frequency of dividend payers is not evident internationally[105].

DeAngelo, DeAngelo and Skinner (2004) argue that, rather than decreasing, the aggregate dividends paid out by US industrial companies in the last two decades have been increasing. They argue that dividend payouts are not “disappearing”, instead concentrated in firms with high earnings. Denis and Osobov (2008), Eije and Megginson (2008) and Ferris et al. (2009) also find that the aggregate dividends paid have increased substantially over time. Denis and Osobov (2008) suggest that the growing aggregate cash dividends are paid by a small number of large and profitable firms. A wide range of empirical investigations[106] (Fama and French, 2001; Benito and Young, 2001; Ferris et al., 2006; Eije and Megginson, 2008; Ferris, Jayaraman and Sabherwal, 2009; Renneboog and Trojanowski, 2011) suggest that large firms with high profitability and low growth opportunities have generally greater chance to pay dividends. Fama and French (2001) attribute partly the greater reluctance to pay dividends in the US to the surge of new listings that are becoming smaller, less profitable and confronting greater growth opportunities. Agency costs of free cash flow hypothesis (Jensen, 1986) and life cycle explanation (Grullon, Michaely, and

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[103] Ferris et al. (2009) find that companies in civil law countries are more inclined to pay dividends and less likely to occur percentage reduction than those in common law countries.

[104] Earned equity refers to the ratio of retained earnings to total book equity.

[105] For example, as shown in Ferris et al. (2009), the percentage of dividend-paying firms in the US increased slightly from 18% in 2001to 22% in 2004. For the UK, the percentage of dividend payers even dropped from 55% to 45% over the same period.

[106] Ferris et al (2009) also employ these factors in measuring the propensity of dividend behavior, but they do not report the coefficients of these variables are significant in their tests.

Swaminathan, 2002 and DeAngelo and DeAngelo, 2006) shed light on these observed relations[107]. However, relative to firm size and profitability, growth opportunity seems to be a more debatable factor in explaining dividend patterns. Denis and Osobov (2008) find that the effect of growth opportunity proxy on the decision of whether firms pay dividends is significantly negative in the US, Canada and the UK, but mixed in Germany, France and Japan. Additionally, by testing a sample consisting of emerging capital markets, Aivazian and Booth (2003) find that the impact of market to book ratio on the scale of dividend payments is positive, inconsistent with the expected relation.

DeAngelo, DeAngelo, and Stulz (2006) observe a significant and positive relationship between the decision to pay dividends and earned/contributed capital mix which is assumed as a proxy of firm maturity. Denis and Osobov (2008) firmly confirm that the change in the propensity to pay dividends can be explained by the earned/contributed capital mix. In contrast, Eije and Megginson (2008) find that the effect of the ratio of retained earnings to total equity on dividend policy is not significant[108]. Eije and Megginson (2008) conjecture that leverage and cash dividend payouts might be substitutes in controlling agency costs, and Eije and Megginson (2008) and Renneboog and Trojanowski (2011) offer evidence suggesting that the propensity to pay dividends is negatively influenced by leverage[109].

LaPorta et al. (2000) suggest that international dividend policies differ under different legislative regimes: common law and civil law[110]. Eije and Megginson (2008) show that common law jurisdiction and smaller cash holdings cause companies to pay out dividends rather than to repurchase shares. Ferris et al. (2009) concentrate on the comparison between common law and civil law jurisdictions and find that civil law firms generally execute more generous dividend policies than common law firms[111], consistent with the implication of "substitute model" of dividend policy proposed by LaPorta et al. (2000). Moreover, the dividend decisions have been related to catering

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[107] Higgins (1981) argues that higher (lower) growth and/or lower (higher) profitability cause the poor (rich) availability of cash. Jensen (1986) suggests that dividends will help reduce the agency costs when substantial free cash flow is accumulated. Grullon, Michaely, and Swaminathan (2002) and DeAngelo and DeAngelo (2006) suggest that the interest tradeoff between the costs of paying dividends and the savings of agency costs tends to vary at different phases of a corporation's life cycle.

[108] Instead, Eije and Megginson (2008) find that firm age, an alternative proxy of corporate lifecycle, is a determining factor of the likelihood to pay dividends.

[109] The other multi-national evidence is provided by Aivazian and Booth (2003) who find a negative relation between debt ratios and dividend payments.

[110] LaPorta et al. (2000) hypothesized two models of agency costs. "Outcome model" predicts that companies in common law countries where investor protection is strong are more likely to pay high dividends because minority investors have enough right to force managers to pay so as to reduce agency costs. "Substitute model" predicts that companies in civil law countries where investor protection is relatively weak tend to pay high dividends because managers want to build up reputation for future external financing by distributing cash flows. The empirical results in LaPorta et al. (2000) support "outcome model".

[111] Specifically, Ferris et al. (2000) find that civil law firms tend to have higher fraction of dividend payers, dividend continuation rate, increase percentage of aggregate dividends and payout ratios.

consideration (Baker and Wurgler, 2004; Li and Lie, 2006; Ferris, Jayaraman and Sabherwal, 2009), risk of enterprises (Hoberg and Prabhala, 2008; Eije and Megginson, 2008; Ferris at el., 2009), earning report frequency and privatized company dummy[112] (Eije and Megginson, 2008).

Another trend considered by previous research is the substitutability between cash dividends and share repurchases. Grullon and Michaely (2002) study a sample covering the period 1972 to 2000 and argue that US listed firms gradually substituted repurchases for dividends to return earnings to shareholders. Skinner (2008) suggests a similar trend and contends that dividends are becoming extinct among US companies. Skinner's findings are in line with the survey conducted by Brav, Graham, Harvey, and Michaely (2005). However, other recent non-US based studies (Ferris et al., 2006; Eije and Megginson, 2008; Renneboog and Trojanowski, 2011) do not provide direct evidence to support that dividends are being substituted by share repurchases as a way of distributing the free cash flow[113].

These conflicting results imply that the disappearing dividend phenomenon is still controversial and that there is still a need to assess the various factors that may contribute to the trend in dividend payment. This empirical chapter contributes to existing research in the following ways:

1. It examines global trends in dividend policy across seven developed economies between 1989 and 2010, and it looks at the extent to which repurchases play a role in dividend policy as well. Stock repurchase policy across the main stock markets is not a focus in recent studies relating to corporate payouts (Denis and Osobov, 2008, Ferris et al., 2009). Although Eije and Megginson (2008) investigate share repurchases, their study is on a continental-wide basis, treating fifteen European countries as one entity. In contrast, my research is a country-specific analysis. The patterns of stock repurchases among the main capital markets are depicted and the determinants of repurchase decisions are investigated.
2. In contrast to existing evidence, this study investigates more dividend behaviors, including dividend increases, decreases, unchanged, initiations, omissions, and dividend continuation. A variety of company characteristics are compared between control groups. Examining various dividend behaviors helps expand the

[112] Both the average reporting frequency and private companies have positive association with the amounts of payouts.
[113] Eije and Megginson (2008) find that the proportion of European firms repurchasing shares has been increasing while the propensity of paying dividends declined.

understanding towards the complete picture of dividend policies in the main stock markets.

3. A long sample period has been chosen, so that those potential problems caused by a shorter sample period are avoided. For example, Denis and Osobov (2008) argue that the observed trends in dividend payment might simply result from the relatively short forecast period applied in their study. As Denis and Osobov (2008) and Partington (2009) point out, there is a possibility that Worldscope database initially might cover the larger and more mature firms and then add smaller and less mature firms for years that are more recent. If so, the decline in the propensity of paying dividends may be overstated because the established firms are better candidates to pay dividends (Fama and French, 2001). The sample period chosen in this study covers twenty two years from 1989 to 2010, including the periods used by Denis and Osobov (2008) (1989-2002), Eije and Megginson (2008) (1989-2005) and Ferris et al. (2009) (1994-2007). By extending the sample period, the issue of biased data coverage can be mitigated[114]. Julio and Ikenberry (2004) observe an increase in the percentage of dividend-payers in the US market from 2001 to 2004, but it is not certain that this is a long-term tendency. To assess the consistency of "reappearing dividends", the relevant tests need to cover longer observation periods.
4. Petersen (2009) notes that in panel data based regression analysis, the appearance of clustered residuals across firms, or across time, is very likely, and that this leads to biased standard errors. Most existing studies[115] do not address this issue properly, or do not specify a solution to this problem (Ferris et al., 2009). Therefore, I follow Petersen (2009) and correct the clustered standard errors across firms and across years in its estimation of logistic panel regressions.
5. In addition to the variables already used in preceding studies, more variables that are comprehensive are included to examine the drivers of dividends and share repurchases policies, such as high technology dummy, ratio of R&D to total assets, M&A related factors, and delisting activity. To my knowledge, the impact of M&A and delisting have not been directly used to explain the incidence of corporate payouts and relevant theoretical hypotheses are absent in

[114] Specifically, the test undertakes longer benchmark period to overcome the potential effect of noisy time.

[115] Fama and French (2001), DeAngelo et al. (2006), and Denis and Osobov (2008) follow a Fama-Macbeth procedure which is proven inappropriate with the presence of a firm effect as suggested by Petersen (2009). Alternatively, Eije and Megginson (2008) apply a bootstrapping method. The tests conducted by Cheng, Nagar, Rajan (2005) and Petersen (2009) show that bootstrapped standard errors are not materially different from the clustered standard errors.

literature.

This empirical analysis reveals a series of interesting trends in dividend payment. The overall fraction of dividend payers fell significantly from 1989 through to the early 2000s for companies in all sample countries. This observation basing on the extended sample period is in general consistent with the findings reported in Denis and Osobov (2008) and Ferris et al. (2009). From the beginning of 2000s on, the percentage of payers reverts slightly upwards in the US, Canada, Japan and Hong Kong, in line with Julio and Ikenberry's (2004) "reappearing dividends" assertion. Nevertheless, in the three European countries, UK, Germany and France, the concept of "reappearing dividends" is not evident. The aggregate real dividends paid have continuously increased over the full sample period, especially since the beginning of 21st century. Firms that disgorge cash flows in all sample countries retained stable dividend payout ratios and total payout ratios during the sample period, in line with Eije and Megginson (2008) who sampled European countries. Consistent with the arguments of Fama and French (2001) and Denis and Osobov (2008), significant decline in the proportion of newly listed firms that paid dividends is observed in the US, Canada, UK, Germany and France. By contrast, the proportion of of newly listed firms in Japan and Hong Kong that intend to pay dividends remains relatively stable.

This study contributes to the literature by observing the patterns of stock repurchases at firm level for individual countries. US firms distinguish visibly from firms in other countries in the substitutability between cash dividends and share repurchases. In the US, share repurchases took over from dividends as the dominant payout form in terms of absolute amounts, and the numbers of dividend paying firms and stock repurchasing firms are not far apart. The increasing importance and prevalence of share repurchases are found in Canada and the UK. It is observed that UK companies experienced a pronounced surge in the amounts of repurchases from 1989 to 2008, but the number of repurchasing firms is actually far less than those of dividend paying firms. The population of Canada firms that repurchased stocks fluctuates at high level but the amount of repurchases is relatively unimportant. For the remaining countries, dividend payment is still an overwhelming method of paying out earnings.

I investigate the determinants of corporate payout decisions and my primary results can be summarized as follows. In general, both the decisions of paying dividends and repurchasing stocks are influenced by size, profitability, the fraction of retained earnings and leverage and the corresponding signs of coefficients coincide with those suggested by literature in relation to dividend policy. These results are basically consistent with the implication of maturity hypothesis. That is, more mature firms are more likely to pay dividends and to repurchase dividends. My results contribute to resolving a controversy between Denis and Osobove (2008), and Eije and Megginson (2008) by showing that earned/contributed capital mix is a strong determinant with positive effect on the decision to pay dividends. My results contribute to confirming the strong negative relation between corporate payouts and leverage level existing in each observed stock market, which is consistent with Jensen (1986) implying dividends and debt are substitutes in reducing agency costs. However, in line with Denis and Osobove (2008), the results about the effect growth opportunity are mixed. The coefficient of market to book ratio is negative but not significant for Germany. The coefficients of total assets growth are of the "wrong" sign or insignificant for some countries such as Germany and Japan. Controlling for these characteristics discussed in this section, I document a declining propensity to pay dividends, namely, the gap between expected and actual percent of dividend payers, in all sample countries, apart from Japan, for 1989-2010. For the communal forecast period 1996-2002, the observed propensity to pay dividends in my tests is qualitatively similar with the corresponding finding in Denis and Osobove (2008)[116].

Some new explanatory variables that have not been examined in competing studies display different impacts on the decisions of dividends and repurchases, but their effect is not uniform across the countries. There is some evidence to suggest that cash holdings are negatively related the decision to pay dividends, but positively related the decision to buy back shares. This result is partly consistent with Lee and Suh (2011) who contend a positive relation between cash holdings and repurchases. It might be explained that firms with high liquidity tend to pay in form of repurchases to keep flexible cash flows. There is some evidence that technology intensity and R&D expenditure are negatively related the likelihood to pay dividends but their effects on the likelihood to repurchase shares are more mixed. High technology and large R&D expenditure can be assumed to represent the rich growth opportunities, which cause low dividends.

The results show that the effect of M&A on the incidence of payouts is highly heterogeneous in different countries. For example, the US dividend paying firms have

[116] It is relatively reasonable to compare the relevant results in Denis and Osobove (2008) with my results since their benchmark period (1989-1993) used is similar to mine (1989-1995). The benchmark period chosen by Ferris et al. (2009) is 1994-1997, which is more different from that used in my study.

lower probability to be acquirers, but conversely, the UK counterparts have higher probability to be acquirers. In the US and the UK, dividend-paying firms are more likely to be acquired, while repurchasing firms have higher probability to be acquirers. These results imply that the relation between payout policies and M&A factors is not uniform among countries, maybe due to the discrepancy in motivations, regulations and patterns of M&A operations among different countries. The interrelation between dividend decisions and M&A activity remains an open direction for future research. The results show that firms facing the risk of being de-listed are less likely to be dividend payers. The behind explanation might be attributed to agency conflicts and/or financial distress. Beside, the results demonstrate that repurchases and dividends are at least not perfect substitutes as share repurchases are primarily implemented by dividend payers. Additionally, there is little evidence to suggest that payout decisions are influenced by market sentiment, as argued by Baker and Wurgler (2004a).

I also contribute to the literature by investigating the amounts of both dividend and share repurchases. I show that profitability, growth rate of total assets and leverage remain important factors in determining dividend amounts, and the associated signs are the same as those made in respect to the decision to pay dividends. The effects of size and the fraction of retained earnings on dividend amount are mixed[117]. The results illustrate that firms with high market to book ratio or high cash holdings are less likely to opt for cash dividends, but if they did pay out, they paid out more[118]. In addition, there is strong evidence that market to book ratio is positively associated with the amount of repurchases.

Furthermore, using the method of comparison, the analysis reveals that firms that increased dividends are larger and have higher profitability[119], growth opportunities, the fraction of retained earnings[120] and higher cash holdings than firms that decreased dividends. They are also less likely to operate in high technology sector and have lower delisting rate than firms in other control groups. The only consistent evidence found in this section to support the catering theory is that US dividend-increasing firms have a greater value-weighted dividend premium (*EDP*) than dividend-decreasing firms. In addition, the comparisons show that firms in start-paying group are of smaller size, higher growth rate, lower fraction of retained earnings and higher leverage level than

[117] For example, the signs of coefficients on size and the fraction of retained earnings are negative for the US but positive for the UK.
[118] Similarly, Aivazian and Booth (2003) observe a positive relation between market to book ratio and dividend amount. In addition, their results also show a mixed effect of size on dividend amount.
[119] US companies are exceptional for this case.
[120] Hong Kong companies are exceptional for this case.

stop-paying group. These findings are consistent with the maturity hypothesis.

Using Lintner's (1956) model, I find that the relation between dividends and earnings weakened across countries and this conclusion is in line with Skinner (2008), and Eije and Megginson (2008). In addition, over the past two decades, the US companies rather than companies in other parts of the world sped up the adjustment of dividends. Moreover, I use the method developed by Grullon and Michealy (2002) to examine the choices of payout methods. Overall, companies in the sample preferred stability in their choice of payout method, and preferred not to change payout methods frequently. US and Canada companies are more likely to distribute their first payouts in the form of repurchases relative to the firms in counterpart countries.A considerable percentage of companies switched from using single payout methods to using mixed or dual payout methods, implying that single payout channels cannot fulfill the complete needs of market participants.

The rest of this chapter is organized as follows. Section 2 introduces the sample and describes the data. Section 3 reports the evolution of dividend payments and share repurchases. Section 4 explores the propensity to pay dividends. Section 5 presents advance evidence on dividend policy and repurchase policy. Section 6 examines firm characteristics of companies that paid dividends. Section 7 examines the relationship between dividend payouts and earnings, and the speed of adjustment of dividends. Section 8 examines changes in payout methods. The summary and conclusions are presented in the last section.

5.2 Sample and Data

5.2.1 Sample Selection

The initial sample data includes all non-financial, non-utility firms listed on the public market in the US, the UK, Japan, Canada, Germany, France, and Hong Kong. Following precedents set in other recent dividend studies[121], this study excludes firms in the financial and utility sectors because the dividend policies of these firms are different from industrial firms, and are highly constrained by external forces. These countries in sample are chosen because they are influential and established economies, for which

[121]Fama and French (2001), DeAngelo, DeAngelo and Stulz (2006), Denis and Osobov (2008), and Renneboog and Trojanowski (2011)

relevant financial data is complete. Of countries sampled in this research, the US, UK, Japan, Canada, Germany, and France are also included in the research of Denis and Osobov (2008), but this study adds Hong Kong to the list. The sample countries are representative since they include four common law countries and three civil law countries. However, unlike Ferris et al. (2009), this study does not focus primarily on comparing dividend patterns of firms in different law jurisdictions.

A sample period covering 1989 to 2010[122] is selected for the following reasons. First, it is known that company information published by Worldscope at early years is not suitable for empirical analysis[123]. Denis and Osobov (2008) and Eije and Megginson (2008), who sampled their research using Worldscope, set 1989 as their earliest cut off point for data collection[124]Second, this study identifies firms as dividend payers only if corresponding 'dividend payment dates' are available in DataStream. I find that the item of 'dividend payment dates' has many missing data prior to 1988. **Table 5-1** lists the numbers of firms for observed countries in the sample.

In addition, in the following analysis in respect of repurchases, the sample covers the period from 1989 to 2010 in the US, and the shorter period of 1999 to 2010 in respect of Canada, the UK, Germany, France, Japan and Hong Kong because of the data availability. In fact, the operations of share repurchases were not popular globally except for in the US. Denis and Osobov (2008) note that the process of repurchasing is not launched in France, Germany, or in Japan until the late 1990s. Worldscope through Datastream Excel supplies all data applied in this study. The principles of data collection and sample inclusion used in this study are as follows. (1) Consecutive accounting data including total assets, market capitalisation, net income, common equity, dividend per share (DPS), earnings per share (EPS) and base date are available. (2) Annual rather than quarterly data is used, because dividend amounts are set in response to annual rather than quarterly earnings (Watts, 1973). (3) All firms with historical records in DataStream are included in the sample irrespective of status (i.e. active, dead or suspended). (4) Follow Eije and Megginson (2008), firms without usable International Security Identifying Number (ISIN) are excluded from the sample.

[122] In calculating the growth rate of total assets, data on one year lagged total assets need to be used. Therefore, the data on total assets cover 1988-2010 actually.
[123]Denis and Osobov (2008) claimed that World Scope coverage is not complete prior to 1985. Partington (2009) also discussed the issue of Worldscope data coverage.
[124] Ferris et al.(2009) begin their sample in 1994.

Table 5-1 Statistics of Sample

“Payer” means the number of listed firms that paid cash dividends in each observed year. “Obs” means the total number of observed listed firms in each observed year. “Percent of Payers” means the percentage of dividend payers, which is calculated as the value of “Payer” divided by the value of “Obs”.

Year	US			Canada			UK			Germany			France			Japan			HK		
	Payer	Obs	% of	Payer	Obs	% of	Payer	Obs	% of	Payer	Obs	% of	Payer	Obs	% of	Payer	Obs	% of	Payer	Obs	% of
1989	940	1618	58.10%	86	137	62.77%	863	950	90.84%	156	197	79.19%	190	220	86.36%	949	1052	90.21%	60	64	93.75%
1990	951	1656	57.43%	89	158	56.33%	905	996	90.86%	190	225	84.44%	214	245	87.35%	1202	1300	92.46%	61	71	85.92%
1991	968	1867	51.85%	86	166	51.81%	875	1026	85.28%	211	245	86.12%	226	269	84.01%	1430	1547	92.44%	78	88	88.64%
1992	984	2015	48.83%	82	162	50.62%	840	1039	80.85%	224	267	83.90%	241	288	83.68%	1431	1573	90.97%	96	106	90.57%
1993	1009	2180	46.28%	90	176	51.14%	850	1085	78.34%	231	303	76.24%	230	300	76.67%	1374	1598	85.98%	94	108	87.04%
1994	1081	2889	37.42%	91	180	50.56%	911	1144	79.63%	220	315	69.84%	218	316	68.99%	1370	1652	82.93%	125	133	93.98%
1995	1122	3213	34.92%	98	204	48.04%	979	1173	83.46%	230	315	73.02%	244	325	75.08%	1405	1710	82.16%	189	216	87.50%
1996	1116	3568	31.28%	95	212	44.81%	1065	1351	78.83%	251	359	69.92%	298	409	72.86%	1478	1766	83.69%	238	304	78.29%
1997	1111	3755	29.59%	93	221	42.08%	1128	1461	77.21%	252	375	67.20%	316	480	65.83%	1523	1798	84.71%	249	330	75.45%
1998	1064	3932	27.06%	98	308	31.82%	1085	1426	76.09%	283	395	71.65%	346	551	62.79%	1625	1964	82.74%	242	350	69.14%
1999	992	3901	25.43%	103	375	27.47%	968	1319	73.39%	304	436	69.72%	382	595	64.20%	1541	2012	76.59%	190	367	51.77%
2000	908	3834	23.68%	101	410	24.63%	827	1354	61.08%	321	575	55.83%	358	670	53.43%	1593	2040	78.09%	243	489	49.69%
2001	843	3677	22.93%	101	454	22.25%	741	1371	54.05%	319	651	49.00%	377	675	55.85%	1656	2071	79.96%	263	634	41.48%
2002	815	3599	22.65%	118	495	23.84%	705	1352	52.14%	258	603	42.79%	338	640	52.81%	1608	2098	76.64%	285	696	40.95%
2003	921	3553	25.92%	141	516	27.33%	671	1293	51.89%	218	573	38.05%	318	597	53.27%	1676	2106	79.58%	319	736	43.34%
2004	1000	3569	28.02%	160	563	28.42%	668	1362	49.05%	202	537	37.62%	302	574	52.61%	1798	2138	84.10%	383	779	49.17%
2005	1059	3564	29.71%	184	614	29.97%	667	1507	44.26%	228	540	42.22%	304	575	52.87%	1870	2186	85.54%	435	800	54.38%
2006	1070	3533	30.29%	198	636	31.13%	678	1600	42.38%	239	546	43.77%	320	610	52.46%	1915	2226	86.03%	456	835	54.61%
2007	1070	3487	30.69%	174	617	28.20%	677	1571	43.09%	258	620	41.61%	327	619	52.83%	1938	2244	86.36%	477	892	53.48%
2008	1061	3406	31.15%	171	592	28.89%	649	1429	45.42%	286	637	44.90%	335	598	56.02%	1916	2225	86.11%	510	921	55.37%
2009	951	3313	28.71%	167	553	30.20%	508	1299	39.11%	250	601	41.60%	267	553	48.28%	1723	2178	79.11%	450	968	46.49%
2010	974	3152	30.90%	160	515	31.07%	508	1135	44.76%	228	498	45.78%	263	480	54.79%	1721	2130	80.80%	532	969	54.90%

5.2.2 Data Description

Table 5-2 Definitions of Variables

The table provides the list of variables and their definitions. DataStream Codes are denoted in brackets

Variable	Definitions
SIZE	The percent of firms with smaller market capitalization [08001] in each stock market for every sample year (Fama and French 2001; Denis and Osobov, 2008)
LNMC	Log (market capitalization [08001] in 2010 price)
PROFIT	(net income [07250] + interest expense if available [01075] + deferred taxes if available [03263]) / book value of total assets [07230][125]
MTBV	Market to Book Ratio = (Total Assets [07230] – Common Shareholders' Equity [03501] + Market Capitalisation [08001] / Total Assets [07230])[126]
GOA	(Total Asset$_t$ [07230] - Total Assets $_{t-1}$) / Total Assets $_{t-1}$
RETE	Retained Earnings [03495] / total equity [07220]
LEVERAGE	Long-term debt [03251] / Total assets [07230]
AGE	The number of years between the base year and the observed year
CTAT	cash [02003] / total assets [07230], where cash represents the money available for use in the normal operations of the company, and it is the most liquid of all company assets
R&D	Research & Development (R&D) [01201] / Total Assets [07230]
VDP	Value weighted dividend premium, the difference between the logs of the value-weighted average market-to-book ratios of payers and non-payers, where the weight is the book value of total assets
EDP	Equally weighted dividend premium, the difference between the logs of the equally-weighted average market-to-book ratios of payers and non-payers, where the weight is the book value of total assets
HITECH	A dummy variable, taking on the value of 1 if a sample firm is categorised as operating in the high technology industry and 0 otherwise
ACQUIERER	A dummy variable, taking on the value of 1 if a company in the sample became an acquirer between 1989 and October 2011, and 0 if otherwise, for all sample years
TARGET	A dummy variable, taking on the value of 1 if a company in this sample became a target firm between 1989 and October 2011 for all sample years and 0 otherwise
TIN3	A dummy variable, taking on the value of 1 if M&A takes place within 3 years of the observed year for an acquirer, 0 otherwise
TAKENIN3[127]	A dummy variable, taking on the value of 1 if M&A takes place within 3 years of the observed year for a target firm, 0 otherwise
DLIN3	A dummy variable, taking on the value of 1 if an observed firm is de-listed within 3 years of year t and 0 otherwise

[125] This method of calculation is used by Fama and French (2001) and Dennis and Osobov (2008).
[126] This method of calculation is used by Fama and French (2001) and Dennis and Osobov (2008).
[127] One obstacle noted in data collection relates to the fact that DataStream only provides the last record of an M&A for an acquirer, whilst in reality it is common for an acquirer to takeover several different target companies.

5.3 International Trends in Dividend Payments and Share Repurchases

5.3.1 Proportion of Firms that Pay Dividends

My investigation presents the evolution and progression of dividend payments in seven developed economies between 1989 and 2010. First, contrary to the conclusion of Ferris et al. (2009) (P.520), the declining number of dividend payers is not a global phenomenon. **Table 5-1** reports that three European countries, France, Germany and UK[128], has exhibited decrease in the population of payers since the early 2000s or the late 1990s. However, the number of dividend-paying firms remained constant in the US, ranging between 940 in 1989 and 974 in 2010. In Canada, Japan and Hong Kong, there is even a continuously increase in the number of dividend paying firms over the entire sample period.

Second, the total numbers of exchange-listed firms increased substantially from 1989 to the beginning of 2000s. For example, the number of observations in the US surged from 1618 in 1989 to 3932 in 1998, similar to the results provided by Julio and Ikenberry (2004) and Denis and Osobov (2008). Thereafter, the stock market population ceased growing across countries except Japan and Hong Kong.

Third, **Figure 5-1** shows that the overall proportion of dividend payers fell significantly from 1989 through to the early 2000s for companies in all sample countries except in Japan where the proportion remained relatively constant over the sample period, consistent with the findings reported in Denis and Osobov (2008) and Ferris et al. (2009). Firms in the US and Canadian, two North-American countries, display similar synchronous trend in dividend payments. In both countries, the proportion of payers decreased significantly from 1989 to 2000 and increased slightly thereafter. Over the same period, in France, Germany, Hong Kong, and the UK, the payer percent decreased from 90% to roughly 50%.

Fourth, in line with Julio and Ikenberry's (2004) "reappearing dividends" assertion, the percentage of payers is slightly restored in the US, Canada, Japan and Hong Kong in the 2000s. For example, in the US, the percent increased from 22.93% in

[128] This declining trend may be related the abolishment of ACT in 1999, which had benefited dividend-payers by contributing tax credits in actual.

2001 to 30.9% in 2010. However, “reappearing dividends” cannot be observed in France, Germany, and the UK. In particular, in the UK, the proportion of dividend paying firms actually fell from 54.05% in 2001 to 44.74% in 2010. Intuitively, the declines in the proportion of dividend payers up to the outset of 21 century seem to be more influenced by the expansion of capital markets than the decrease of dividend payers.

Fifth, I show that new listings appear to become more reluctant to pay dividends. **Table 5-3** presents statistics on the proportion of newly listed firms that paid dividends. In this table, “Payer” refers to the newly listed companies that paid dividends after their IPO. In a comparable analysis, Ferris et al. (2009) only take into account firms that pay dividends in listing years. This table provides a more comprehensive explanation of the trends in dividend payments, as many firms distributed dividends after the first post-IPO year in practice. **Table 5-3** shows that 64.62% of US listed firms that are issued before 1989 eventually became dividend-payers. However, this percentage declines to 27.04% between 1989 and 1995, 16.57% between 1996 and 2000, 24.3% between 2001 and 2005, and 19.63% between 2006 and 2010. A highly similar tendency is found for new listings in Canada. In the UK, Germany and France, the important turning point appears around the period 1996 to 2000. For example, in the UK, the percentage of newly listings that pay dividends after IPO is 81.12% for 1989 to 1995, but decreases to 52.72% for 1996 to 2000, and hits a low at 29.17% for 2006 to 2010. In contrast, companies in Japan and Hong Kong exhibit a relatively smaller decline. Additionally, newly listed firms in the US and in Canada showed a lower propensity to pay dividends than their counterparts in the UK, Germany, France, Japan and in Hong Kong. Over the entire period, the best dividend payers are firms in Japan (94.8%), while the lowest ones are in the US (35.17%). This reluctance by newly listed firms to pay dividends is generally consistent with the findings of previous studies, such as Fama and French (2001), and Denis and Osobov (2008), which attribute a reduction in the percentage of dividend payers to the soaring number of newly listed firms that do not pay dividends.

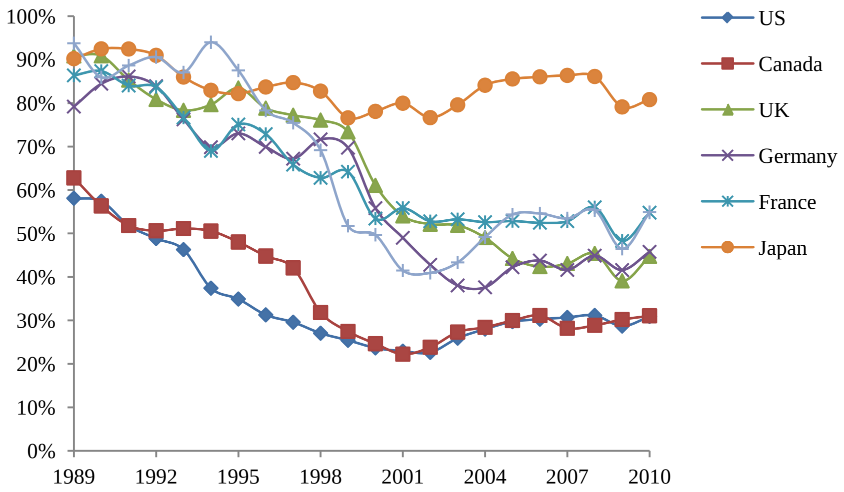
Table 5-3 Proportion of Newly Listed Dividend-Paying Firms

"Payer" column displays the numbers of newly listed firms that paid cash dividends after IPO. "New List" column displays the numbers of firms that were issued during each individual period. "Rate" column displays the percentages of dividend payers where a percentage is calculated as the number shown in "Payer" divided by the corresponding number shown in "New List".

Period	US			CANADA			UK			GERMANY			FRANCE			JAPAN			HONG KONG		
	Payer	New List	Rate	Payer	New List	Rate	Payer	New List	Rate	Payer	New List	Rate	Payer	New List	Rate	Payer	New List	Rate	Payer	New List	Rate
Full period	2350	6682	35.17%	526	1537	34.22%	1958	3056	64.07%	660	1002	65.87%	802	1096	73.18%	2518	2656	94.80%	876	1076	81.41%
<1989	1350	2068	65.28%	205	407	50.37%	987	1019	96.86%	282	294	95.92%	124	130	95.38%	1330	1362	97.65%	180	193	93.26%
1989-1995	417	1542	27.04%	97	340	28.53%	318	392	81.12%	94	102	92.16%	270	289	93.43%	511	515	99.22%	177	209	84.69%
1996-2000	297	1792	16.57%	81	348	23.28%	328	622	52.73%	197	375	52.53%	295	432	68.29%	283	295	95.93%	156	210	74.29%
2001-2005	181	745	24.30%	106	294	36.05%	234	711	32.91%	31	73	42.47%	64	123	52.03%	287	335	85.67%	196	277	70.76%
2006-2010	105	535	19.63%	37	148	25.00%	91	312	29.17%	56	158	35.44%	49	122	40.16%	107	149	71.81%	167	187	89.30%

Figure 5-1 Percentage of Dividend-Paying Firms

The percentage of dividend-paying firms is calculated as the number of dividend paying firms divided by the total number of listed firms.



5.3.2 Evolution of Dividend Payments and Share Repurchases

Previous competing studies (Denis and Osobov, 2008; Eije and Megginson, 2008; Ferris et al. 2009) do not explicitly contrast the historical changes in dividend payments and share repurchases. **Figure 5-2** contributes to overcoming this gap in the literature by illustrating the evolution of dividend payouts and share repurchases for seven developed economies from 1989 through to 2010.

Apart from firms in the US, firms in all sample countries display a limited number of cases of share repurchases prior to the late 1990s. Therefore, in respect of repurchases, the sample period selected covers 1999 to 2010 for Canada, the UK, Germany, France, Japan and Hong Kong, and, 1989 to 2010 for the US. The real amounts of both dividend payouts and share repurchases are indicated in 2010 prices[129]. To illustrate the evolution of dividends and repurchases, I develop two measures: comparative value of payout, and relative frequency of payout (No.Rep/No.Div). Comparative value reflects the amounts of dividends and repurchases over time. For each country, the aggregate amount of real dividends in 1989 is set as unit. Then, the comparative value is calculated as the amount of real dividends or share repurchases in each of the following observed years, scaled by the amount of real dividends in 1989. For example, for the US in 2001, the comparative values of repurchases and dividends are 2.37 and 2.33 respectively, indicating that share repurchases and cash dividends are

[129] For these calculations, the Consumer Price Index (CPI) is provided by World Bank database.

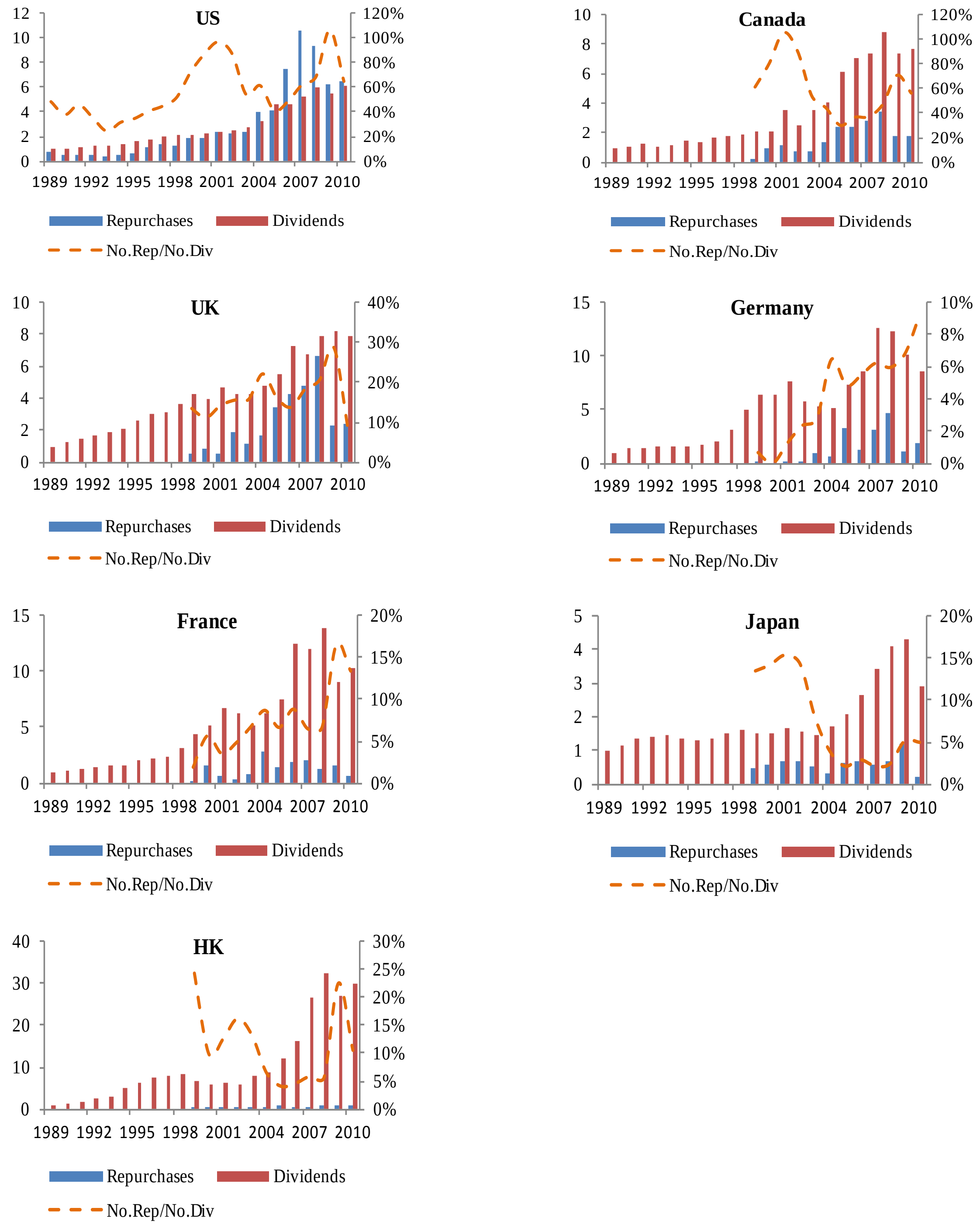
2.37 times and 2.33 times the aggregate dividends in 1989, in terms of real amounts. No.Rep/No.Div represents the relative frequency of payout methods, which is calculated as the number of firms that repurchased share scaled by the number of firms that paid dividends for each observed year.

The results show that the aggregate amount of dividends paid continuously increased in each country during the sample period, consistent with Eije and Megginson, (2008) and Ferris et al. (2009). This trend is most observable in Hong Kong for which the comparative value of dividends is about 30 in 2010. The smallest increase occurred in Japan where the range of competitive value fluctuates roughly between 3 and 4 over recent years, while in the UK it reached 7.87 in 2000.

The patterns of stock repurchases differ among the countries in my sample. In accordance with Grullon and Michaely (2002) and Skinner (2008), amongst the US firms, share repurchases overwhelmed dividends to act as the dominant payout method in terms of absolute amounts. In 1999 and 2000, the amounts of repurchases made by US firms exceeded those of cash dividends. More significantly, the competitive values are 7.45, 10.57 and 9.3 for repurchases versus 4.63, 4.28 and 5.96 for dividends in 2006, 2007 and 2008. In the meantime, the number of firms repurchasing shares also went up. The values of No.Rep/No.Div are 96.56% and 106.2% in 2001 and 2009 respectively, indicating that the number of repurchasing firms is almost equal to that of dividend-paying firms. The increasing importance of share repurchases can also be observed in the UK as the competitive value of repurchases rose from 0.58 in 1999 to 6.61 in 2008, and accordingly, the relative frequency of repurchases rose from 13.53% in 1999 to 28.74% in 2008. But unlike the US firms, UK firms persisted in distributing a large fraction of corporate payouts in the form of cash dividends. These results are comparable to the findings of Renneboog and Trojanowski (2011). In addition, for Canada, whilst the relative frequency of repurchases reached high in some years (e.g. No.Rep/No.Div equals 104.95% in 2001), the amount of repurchases is fairly lower than that of dividends. However, in other countries including Germany, France, Japan, and Hong Kong, share repurchases only accounted for a small fraction of corporate payouts. For example, the highest relative frequency in Germany is only 9.21% in 2010, and the amount of repurchases is significantly lower than that of dividends.

Figure 5-2 Evolution of Dividends and Share Repurchases

This figure illustrates the evolution of dividends paid for seven developed economies from 1989 through 2010. The sample period in respect of repurchases spans from 1999 to 2010 for Canada, the UK, Germany, France, Japan, and Hong Kong, and from 1989 to 2010 for the US. The real amounts of dividend payouts and share repurchases are calculated in 2010 prices using CPI (Consumer Price Index) provided by the World Bank database. "Repurchases" and "Dividends" represent the comparative values of share repurchases and dividends for each sample year. The comparative values amount to the real amounts of dividend payouts and share repurchases for each sample year scaled by the aggregate real dividend in 1989, which is regarded as a unit. No.Rep/No.Div represents the relative frequency of payout methods, which is calculated as the number of firms that repurchased share dividends by the number of firms that paid dividends for each observed year.



5.3.3 Dividend Payout Ratio and Total Payout Ratio

This section presents the evolutions of dividend payout ratios and total payout ratios across sample countries. A dividend payout ratio represents the percentage of a firm's earnings that are paid out as dividends. A total payout ratio represents the percentage of a firm's earnings that are paid out as dividends or repurchases. Following the method used by Julio and Ikenberry (2004), and Eije and Megginson (2008), dividend payout ratio and total payout ratio are set to 1 if earnings are negative or if firms paid more than 100% of their earnings out as dividends[130]. This method has the advantage of avoiding meaningless payout ratios in economic sense. For example, Ferris et al (2009) produce negative dividend payout ratios, such as -95% for Spain in 2002, by using a standard calculation.

Table 5-4 Panel A. reports the mean and median dividend payout ratios for the dividend payers. The results indicate that dividend payout ratios are relatively stable in all main economies during the sample period in contrast to the fraction of dividend payers. For instance, in the US payout ratios maintained in a narrow range between 34.18% and 49.3%, and the standard deviation of mean payout ratios (σ) is only 3.96%. In addition, the observed countries do not materially differ in the magnitude of dividend payout ratios. The highest dividend payout ratio (51.73%) is observed in Germany and the lowest is observed in Japan (39.16%). **Table 5-4 Panel B.** reports the mean and median total payout ratios of firms that paid dividends or repurchased shares. There are no significant fluctuations in total payout ratios across all of the countries. The highest total payout ratio (55.12%) is observed in the US, whilst the lowest (40.89%) is observed in Japan. In general, similar to dividend payout ratios, the total payout ratios follow a stable trend, in line with the result in Eije and Megginson (2008) who sampled 15 European countries.

[130] When calculating dividend payout ratios, such cases account for 10.0%, 21.13%, 6.81%, 13.47%, 8.32%, 8.44% and 7.63% of observations for US, Canada, UK, Germany, France, Japan, Hong Kong respectively. When calculating total payout ratio, such cases account for 27.67%, 27.04%, 10.08%, 15.91%, 10.53%, 10.49%, and 8.87% of observations for US, Canada, UK, Germany, France, Japan, and Hong Kong respectively.

Table 5-4 Dividend and Total Payout Ratios (%)

Year	US		Canada		UK		Germany		France		Japan		HK	
	Mean	Median	Mean	Median	Mean	Media	Mean	Median	Mean	Media	Mean	Median	Mean	Median
Panel A. Dividend Payout Ratio (%)														
1989	37.38	31.01	37.63	31.64	34.92	32.51	51.42	47.10	37.15	26.77	39.22	33.32	51.77	51.61
1990	38.23	32.25	38.6	32.21	39.38	35.35	54.51	48.04	35.85	28.57	34.70	30.10	54.57	53.29
1991	42.82	37.10	45.41	37.5	45.06	39.47	55.30	47.17	37.39	27.32	32.40	27.01	50.94	46.93
1992	47.67	41.07	44.51	42.48	54.74	48.20	56.04	49.38	41.60	32.35	34.09	26.68	55.09	50.00
1993	46.77	40.13	51.81	48.28	55.69	50.10	57.07	50.00	42.95	34.78	38.63	29.47	56.32	50.53
1994	44.91	37.93	43.86	37.5	53.86	49.20	57.98	53.56	47.64	38.08	45.14	34.82	54.82	50.00
1995	41.52	34.74	34.49	28.0	48.87	44.20	58.28	53.26	48.71	37.32	48.63	38.55	47.57	43.33
1996	38.65	31.53	34.4	25.18	48.35	43.87	54.25	48.94	43.61	35.45	45.21	34.79	45.69	41.67
1997	37.73	31.28	39.3	25.64	46.15	41.96	54.68	50.00	46.03	37.86	43.37	33.48	43.63	37.94
1998	36.13	28.57	35.6	24.14	42.94	40.11	55.34	48.71	40.36	34.18	40.43	30.62	44.90	38.46
1999	36.56	27.45	38.23	24.57	41.78	38.66	49.50	41.58	40.22	34.70	43.84	33.95	46.21	42.55
2000	37.20	28.57	35.56	23.81	44.35	39.60	52.38	45.69	39.12	30.88	46.85	36.43	47.79	41.67
2001	34.18	26.98	37.96	26.31	45.49	40.71	53.83	50.00	38.85	32.87	39.84	30.42	44.78	38.00
2002	41.07	32.79	36.98	22.92	47.60	42.43	51.22	44.67	36.60	30.95	36.23	26.20	48.15	43.79
2003	39.97	31.65	41.88	26.67	45.12	40.37	53.14	48.00	40.52	33.56	39.23	28.36	45.02	40.00
2004	40.26	30.80	40.88	33.33	45.94	41.63	47.40	42.86	42.70	34.75	38.38	29.67	44.85	40.00
2005	37.07	28.37	42.44	37.98	43.07	40.00	44.77	37.92	41.52	33.33	32.82	24.49	37.63	33.33
2006	37.84	28.55	51.06	38.57	41.76	37.99	42.42	35.45	39.92	33.27	31.32	24.34	38.35	33.33
2007	38.13	28.99	51.45	42.08	42.03	36.20	43.12	35.31	41.30	36.13	30.45	24.03	36.74	32.25
2008	39.82	28.95	51.51	45.18	42.46	38.14	43.98	38.09	41.27	34.88	32.74	25.99	39.82	33.33
2009	39.84	28.44	48.68	38.38	39.69	37.67	43.95	36.84	41.90	35.33	39.03	30.53	36.46	30.77
2010	49.30	40.43	54.97	40.88	41.60	38.27	57.52	55.01	52.33	44.49	48.97	39.67	39.72	33.33
Mean	40.14	32.16	42.60	33.33	45.04	40.76	51.73	45.80	41.71	33.99	39.16	30.59	45.95	41.19
Median	39.23	31.15	41.38	32.77	44.70	40.05	53.49	47.58	41.29	34.44	39.12	30.26	45.35	40.83
σ	3.96	4.46	6.52	8.06	5.07	4.35	5.22	5.96	4.06	3.87	5.69	4.57	6.18	6.94
Panel B Total Payout Ratio (%)														
1989	56.20	49.45	41.78	32.35	35.53	32.67	54.32	50.00	38.62	27.31	39.63	33.56	51.77	51.61
1990	51.49	42.78	42.53	34.92	41.00	36.06	55.02	48.04	35.95	28.08	35.17	30.29	54.57	53.29
1991	56.98	50.00	53.16	45.45	46.12	39.84	56.46	50.00	38.00	27.78	33.06	27.28	53.02	52.37
1992	57.47	51.11	47.84	44.30	55.15	48.32	56.10	49.38	42.59	32.81	34.92	27.05	55.09	50.00
1993	54.09	46.53	54.27	48.89	56.08	50.66	57.10	50.05	43.66	36.22	39.73	30.04	57.63	51.02
1994	54.54	45.61	51.13	45.98	54.13	49.37	58.02	53.26	48.21	38.20	46.11	36.02	55.71	50.00
1995	52.16	43.10	38.23	30.54	49.25	44.26	62.08	58.33	48.67	37.32	51.71	40.61	49.34	44.24
1996	51.99	41.62	38.85	29.36	48.77	44.26	54.49	48.94	43.90	35.77	45.50	35.01	46.68	41.96

1997	52.98	45.21	43.49	28.91	47.27	42.20	55.25	50.08	47.53	39.48	44.13	34.25	44.82	38.55
1998	53.56	44.44	43.73	29.27	44.61	40.69	55.86	48.72	41.66	35.65	42.17	31.65	45.43	39.13
1999	56.93	52.93	45.09	29.53	45.03	39.34	50.28	42.11	42.13	35.80	48.89	38.11	47.00	42.93
2000	57.67	55.46	47.96	32.36	47.89	41.21	52.64	45.88	42.23	32.82	50.47	39.88	49.20	42.26
2001	53.88	48.23	50.75	32.52	50.48	43.58	53.71	50.00	41.98	34.13	44.54	32.65	46.13	38.46
2002	57.78	55.03	48.48	39.00	52.18	45.07	52.92	45.02	38.51	31.02	40.86	29.14	48.81	44.24
2003	51.76	44.71	51.87	41.56	48.82	42.00	54.99	50.69	44.30	34.77	41.65	30.18	46.96	41.67
2004	56.13	50.47	58.70	49.60	51.82	45.86	51.88	46.95	45.82	35.51	39.71	30.37	46.21	41.18
2005	51.49	41.65	56.59	47.73	47.84	41.68	46.77	38.46	44.09	34.48	33.76	24.87	38.84	33.33
2006	57.15	53.02	63.67	49.98	47.21	40.39	44.87	38.81	43.21	35.02	32.56	24.94	38.77	33.33
2007	60.22	60.24	65.41	49.14	48.37	39.30	46.67	37.89	44.17	37.63	31.18	24.20	37.70	32.14
2008	61.21	61.54	66.00	52.39	49.68	41.89	47.43	41.43	44.20	37.44	33.70	26.18	40.42	33.33
2009	52.66	47.59	58.42	48.36	43.75	38.84	49.30	42.87	46.86	40.07	40.80	31.17	38.51	32.00
2010	61.00	61.67	68.25	59.13	43.68	38.94	64.00	61.92	54.40	48.31	49.94	40.96	40.32	33.33
Mean	55.12	49.08	51.65	40.97	47.64	41.96	53.51	47.55	43.62	35.25	40.89	31.71	46.76	41.79
Median	55.13	48.20	50.94	42.93	47.85	41.62	54.40	48.83	43.76	35.58	40.82	30.77	46.34	41.61
σ	3.02	5.87	8.88	9.33	4.75	4.29	4.80	5.85	4.03	4.57	6.28	5.11	6.07	7.17

5.4 Propensity to Pay Dividends

5.4.1 Determinants on Propensity to Pay Dividends

The methodology of examining a firm's propensity to pay dividends is initially proposed by Fama and French (2001). As the first step, the logistic panel regressions for base period are estimated for each observed country to obtain the baseline estimates. The dependent variables are given a value of 1 if a firm paid dividends and 0 otherwise and the factors chosen in explaining the propensity to pay dividends include firm size, profitability, growth opportunities, ratio of retained earnings to total book equity, and leverage.

I expect that dividend propensity is positively affected by size (*SIZE* and *LNMC*) and profitability (*PROFIT*) and negatively affected by growth opportunity (*MTBV* and *GOA*). As discussed previously, firm size, profitability and growth opportunities are broadly used as the explanatory factors in analysing dividend propensity. According to the free cash flow and lifecycle hypotheses, firms at a mature stage tend to be more profitable, but may face limited investment opportunities, and, therefore, they may need to distribute dividends in order to control the agency costs of free cash flow. Denis and Osobove (2008) argue that large firms have less of a need to communicate information to shareholders through the payment of dividends according to signaling theory.

I also expect that dividend propensity is positively affected by the fraction of retained earnings to total equity (*RETE*). DeAngelo, DeAngelo, and Stulz (2006) argue that mature companies tend to have higher level of retained earnings and they report a significant positive relationship between the decision to pay dividends and the earned/contributed capital mix[131], controlling for other firm characteristics. Denis and Osobov (2008) find the similar results but Eije and Megginson (2008) find no relevant evidence.

Finally, I expect that dividend propensity is negatively affected by debt level. Eije and Megginson (2008) and Renneboog and Trojanowski (2011) find that a firm's tendency to pay dividends is negatively influenced by leverage. Jensen (1986) argue that leverage and cash dividend payouts can be substitutes for controlling agency costs since debt serves as a strong commitment to decipline the behavior of managers.

[131] The term "earned/contributed capital mix" is identical to another term "fraction of retained earnings to total equity" in literature.

However, recent studies do not consider leverage as a determinant when using the method of Fama and French (2001) to measure the propensity to pay dividends.

Table 5-5 reports the descriptive statistics relating to firm characteristics for the full sample period between 1989 and 2010, and for two sub-periods between 1991 and 2000, and 2001 and 2010. Based on the basic model suggested by Jungqvist and Wilhelmy (2003), this research applies random-effects generalised least-squares (GLS) regressions, with corrected cluster error, to test the significance of changes in key firm characteristics over time. For a GLS regression, the dependent variables are the values of a certain characteristic, and the explanatory variables are the natural logarithm of annual time t. The estimated values of significance levels are reported in the last column of the table. The means and medians of size (*LNMC*) fall from the first sub-period (1991-2000) to the second sub-period (2001-2010) except in the US. *LNMC* is time sensitive across all countries. Profitability (*PROFIT*) declines in all countries except Hong Kong and it is also time dependent. It is especially notable that earnings in Canada, the UK and in Germany over the sub-period 2001-2010 and over the entire sample period are on average negative. Similarly, retained earnings (*RETE*) decline significantly except in Japan for which the time trend of RETE is not significant. Growth opportunities (*MTBV* and *GOA*) increase in Canada, in the UK and in Hong Kong, but decrease in the US, Germany, France and in Japan. Time trends of *MTBV* and *GOA* are not significant in Canada, and time trend of *MTBV* is not significant in Hong Kong. *LEVERAGE* declines in all countries except in Germany. However, the associated time trend in the US, Canada and France is not significant. Overall, most of the examined characteristics change significantly over time, and companies across countries experienced a decline in size, profitability and earned equity in general. Relatively, there is no clear-cut time trend in respect of growth opportunities in general.

Table 5-5 Descriptive Statistics on Firm Characteristics Used for Baseline Estimation

This table shows the means and medians of firm characteristics used in the test on the propensity to pay dividends for full sample period 1989-2010 and two sub-periods 1991-2000 and 2001-2010. The last column reports the significance of changes in firm characteristics over time, which is estimated from random-effects, generalized least squares (GLS) regressions with corrected cluster error and the original model developed by Jungqvist and Wilhelmy (2003). *LNMC*, a proxy of firm size, is the nature logarithm of market capitalization in 2010 price. PROFIT, the proxy of profitability, is calculated as (book value of total assets - book value of equity + market value of equity)/book value of total assets. *MTBV*, a proxy of growth opportunities, is measured as the market value of total capital scaled by the book value of total assets. *GOA*, a proxy of growth opportunities, is the annual growth rate of total assets. *RETE* refers to ratio of earned equity, which is measured as retained earnings scaled by total book equity. *LEVERAGE* is measured as long-term debt scaled by book value of total assets. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	1989-2000		2001-2010		1989-2010		Significance
	Mean	Median	Mean	Median	Mean	Median	
			US				
	N=31154		N=34853		N= 69281		
LNMC	11.962	11.821	12.617	12.625	12.291	12.220	***
PROFIT	0.091	0.055	0.023	0.037	0.057	0.047	***
MTBV	2.139	1.516	2.039	1.569	2.089	1.543	***
GOA	0.205	0.090	0.118	0.053	0.159	0.071	***
RETE	0.252	0.305	0.068	0.291	0.160	0.300	***
LEVERAGE	0.173	0.129	0.157	0.093	0.165	0.112	
			Canada				
	N=3477		N=7875		N=11779		
LNMC	11.496	11.523	11.320	11.248	11.378	11.340	***
PROFIT	0.020	0.054	-0.063	0.013	-0.036	0.033	**
MTBV	1.583	1.189	1.941	1.419	1.822	1.316	
GOA	0.195	0.055	0.321	0.061	0.279	0.059	
RETE	0.025	0.128	-0.279	-0.099	-0.178	-0.008	***
LEVERAGE	0.197	0.174	0.119	0.028	0.145	0.076	
			UK				
	N=12392		N=13979		N=28319		
LNMC	10.457	10.252	10.518	10.244	10.487	10.248	***
PROFIT	0.034	0.061	-0.078	0.020	-0.022	0.046	***
MTBV	1.782	1.369	1.859	1.367	1.820	1.368	***
GOA	0.183	0.063	0.224	0.041	0.204	0.054	*
RETE	0.292	0.330	-0.095	0.073	0.101	0.236	***
LEVERAGE	0.111	0.066	0.111	0.035	0.111	0.054	***
			Germany				
	N=3585		N=5806		N=9813		
LNMC	11.461	11.307	11.054	10.774	11.220	11.017	***
PROFIT	0.019	0.027	-0.044	0.015	-0.018	0.021	**
MTBV	1.752	1.306	1.500	1.194	1.603	1.244	***
GOA	0.115	0.039	0.049	0.008	0.076	0.022	***
RETE	0.097	0.176	-0.209	0.050	-0.084	0.127	**
LEVERAGE	0.098	0.060	0.123	0.062	0.113	0.061	***
			France				
	N=4203		N=5921		N=10589		
LNMC	11.403	11.186	11.108	10.794	11.233	10.973	***
PROFIT	0.037	0.041	0.009	0.032	0.021	0.037	***
MTBV	1.600	1.209	1.517	1.245	1.554	1.231	***
GOA	0.187	0.069	0.098	0.037	0.137	0.051	***
RETE	0.312	0.336	0.252	0.399	0.278	0.369	*
LEVERAGE	0.129	0.098	0.126	0.085	0.127	0.091	
			Japan				
	N=17660		N=21602		N=41614		
LNMC	17.612	17.510	17.061	16.867	17.326	17.193	***
PROFIT	0.015	0.015	0.0127	0.017	0.014	0.016	***
MTBV	1.396	1.249	1.208	1.015	1.298	1.124	***
GOA	0.040	0.020	0.032	0.010	0.036	0.015	***
RETE	0.196	0.222	0.200	0.321	0.198	0.264	
LEVERAGE	0.136	0.116	0.099	0.064	0.116	0.090	***
			HK				
	N=2491		N=8230		N=10856		
LNMC	13.804	13.597	13.345	13.111	13.459	13.245	***
PROFIT	0.031	0.044	0.002	0.044	0.009	0.044	
MTBV	1.159	0.928	1.447	1.045	1.378	1.011	
GOA	0.103	0.021	0.234	0.089	0.203	0.074	***
RETE	0.130	0.160	-0.033	0.216	0.007	0.196	**
LEVERAGE	0.088	0.045	0.082	0.023	0.083	0.029	***

5.4.2 Logistic Panel Regressions for the Base Period 1989-1995

Previous comparable studies set relatively short base periods[132]. A weakness is that short base period may lead to inaccurate calculations because of noisy time effect, thus extending the period enables tests to the capture more reliable dividend patterns. In addition, Denis and Osobov (2008) highlight that Worldscope tend to only cover the dividend-paying firms in early years, and the sample periods for recent studies start later than 1989. Due to above considerations, the test in this study use a base period covering 7 years from 1989 to 1995.

In estimating the logistic panel regressions, it is important to address clustering problem issues. Petersen (2009) notes that the clustering of residuals across firms or across time is very likely for regression analysis basing on panel data, and this will lead to biased standard errors. Previous studies do not really deal with this issue properly, nor do they specify or suggest a solution to this problem. Both Fama and French (2001) and Denis and Osobov (2008) use Fama and MacBeth's (1973) approach to estimate logistic regressions for time-series cross-sectional data, and this has the potential to understate standard errors. Ferris et al (2009) do not specify what correction measures they take in their pooled data analysis. As suggested by Petersen (2009), this study corrects two-dimensional clustered standard errors across firms and across years in its estimation of logistic panel regressions[133].

Table 5-6 details the results from estimating the logistic panel regressions. In line with Denis and Osobov (2008), Eije and Megginson (2008) and Ferris, Jayaraman and Sabherwal (2009), the coefficients of firm size, profitability are all positive and highly significant. The results show a positive relation, which is robust for each country in my sample, between the likelihood of paying dividends and earned/contributed equity mix. This finding supports the relevant conclusion in Denis and Osobov (2008) but contrary to Eije and Megginson (2008). Moreover, leverage is found to have a significantly negative influence on the decision to pay dividends in my sample countries, with the exception of in Germany and in Hong Kong, in line with with Eije and Megginson (2008). However, the results relating to growth opportunities (*MTBV* and *GOA*) are somewhat mixed, in line with Denis and Osobov (2008). Specifically, market to book ratio has significantly negative coefficients in regressions for all countries apart

[132] The base period is 1989-1993 for Denis and Osobov (2008), Eije and Megginson (2008) and 1994-1997 for Ferris et al (2009).
[133] Ferris, Jayaraman and Sabherwal (2009) also use the similar method in their panel data analysis

Table 5-6 Logistic Panel Regressions for Base period 1989-1995

This table presents results from estimating logistic panel regressions for seven economies over a base period 1989-1995. Suggested by Petersen (2009), standard errors are corrected in two dimensions of firm and year. The dependent variable equals one if the firm pays dividends in year t and zero otherwise. The definitions of explanatory variables are as follows. SIZE is a measure of firm size that represents the percent of firms with smaller market capitalization in each stock market for every sample year. PROFIT, the proxy of profitability, is calculated as (book value of total assets - book value of equity + market value of equity)/book value of total assets. MTBV, a proxy of growth opportunities, is measured as the market value of total capital scaled by the book value of total assets. GOA, a proxy of growth opportunities, represents the annual growth rate of total assets. RETE refers to ratio of earned equity, which is measured as retained earnings scaled by total book equity. LEVERAGE is measured as long-term debt scaled by book value of total assets. *p*-values are reported in parentheses and significance levels are indicated. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	US	Canada	UK	Germany	France	Japan	HK
Intercept	-1.06***	-0.25	2.11***	0.51	0.62**	1.99***	0.97*
	(0.00)	(0.38)	(0.00)	(0.14)	(0.04)	(0.00)	(0.06)
SIZE	3.33***	3.67***	3.15***	1.55***	1.74***	1.89***	4.33***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PROFIT	0.47***	3.43***	6.17***	3.19***	10.90***	39.38***	15.15***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
MTBV	-0.48***	-1.06***	-0.96***	-0.03	-0.44**	-0.82***	-1.02***
	(0.00)	(0.00)	(0.00)	(0.76)	(0.04)	(0.00)	(0.00)
GOA	-1.32***	-1.04***	-0.28**	1.70**	0.02	2.91***	-0.09
	(0.00)	(0.00)	(0.02)	(0.03)	(0.98)	(0.00)	(0.85)
RETE	1.03***	0.98***	0.75***	1.25***	2.00***	2.42***	3.12***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LEVERAGE	-0.64**	-0.99*	-2.34***	-0.90	-2.09***	-1.67***	-2.02
	(0.02)	(0.09)	(0.00)	(0.29)	(0.00)	(0.00)	(0.11)
Obs	13561	1718	7419	1867	1963	10432	786
$\chi2$	2583.57	342.26	785.80	211.69	232.52	1193.36	100.65
Pseudo R^2	21.65%	24.94%	28.05%	16.73%	19.17%	33.21%	39.97%

from Germany. The estimated coefficients of *GOA* are only negative and significant in regressions calculated for the US, Canada and the UK.

5.4.3 Estimation of the Propensity to Pay Dividends

Following the method of Fama and French (2001), the expected percent of dividend-paying firms in year t is computed by applying the estimated coefficients reported in **Table 5-6** to actual firm characteristics in year t, averaging over firms. The forecast error, which is measured as the expected percent of dividend payers minus the actual percent of dividend payers, represents the propensity to pay dividends. My test here is different from the existing competing studies that examine the dividend propensity in the following ways. First, as detailed above, I choose a longer base period in order to strengthen the robustness of the baseline estimates. Second, in estimating the logistic panel regressions, I follow Petersen (2009) to correct two dimensional clustered standard errors in order to avoid biased estimates. Third, I add debt ratio, which is absent in competing studies, as control variable when estimating regression for base period. Fourth, my forecast period (1996-2010) covers the years that are more recent comparing with those used in competing studies[134], so that we can observe the updated dividend propensity.

Table 5-7 shows the expected percentage of payers, actual percentage of payers and the forecast errors for each country by year. First, controlling for key firm characteristics, a lower propensity to pay dividends is generally confirmed in all sample countries, apart from in Japan, in line with preceding evidence[135]Positive forecast errors are predominant with the exception of several years in the UK and in Japan. The smallest mean forecast error (0.58%) is observed in Japan. In other countries, the mean forecast errors range from 13.51% in UK to 19.89% in Canada. It may be reasonable to compare my results with the results in Denis and Osobov (2008) who apply a similar base period (1989-1993) to mine (1989-1995)[136]. In the communal forecast years (1996-2002) of two studies, the propensity to pay dividends observed in my study is primarily higher than the corresponding observation in Denis and Osobov (2008)[137]. In particular, the mean forecast errors for US and Canada in my study are 16.36% and 19.2% comparing with 8.08% and 8.33% in Denis and Osobov (2008).

Second, the propensity of paying dividends declined remarkably in around 2000 in most countries in the sample, especially Hong Kong and the three European countries. For example, the forecast error for the UK increases from 4.01% in 2000 to 12.39% in 2001.

Third, for most countries in my sample, the dividend propensity declines have become moderate for the recent years. For example, the forecast error for the US decreases from 23.97% in 2002 to 12.39% in 2001. However, on the contrary, the dividend propensity decline tends to be larger in the UK in the recent years, consistent with Ferris et al (2009).

Fourth, the patterns of the change in the propensity to pay dividends changed

[134] The forecast period is 1994-2002 for Denis and Osobov (2008), 1994-2005 for Eije and Megginson (2008) and 1998-2007for Ferris et al (2009).

[135] Exceptionally, Ferris et al. (2009) find that the actual percentage of dividend payers is on average higher than the expected percentage for Canada and Japan.

[136] I do not compare my results in this section with the relevant results in Ferris et al. (2009) since they apply a very different base period (1994-1997) which will have distinctive effect on results. Further, Eije and Megginson (2008) do not examine their sample countries individually.

[137] In detail, the observed mean forecast errors during the communal forecast period (1996-2002) in my study are: 16.36% in US, 19.2% in Canada, 4.45% in UK, 9.8% in Germany, 10.8% in France and 1.79% in Japan. The corresponding results in Denis and Osobov (2008) are: 8.08% in US, 8.33% in Canada, 2.96% in UK, 8.8% in Germany, 6.11% in France and 5.05% in Japan.

differ across countries. The standard deviations (σ) of forecast errors are 3.92% and 2.9% for the US and Japan, respectively, suggesting that both countries experienced steady change in the propensity to pay dividends over the sample period. In contrast, the standard deviations of forecasted errors in the UK and in Germany are high at 10.17% and 8.07%, indicating that firms in both these European countries underwent relatively pronounced turbulence in their propensity to pay dividends.

Fifth, I find that the percentage of actual dividend payers is more volatile than that of expected payers. This intensifies the argument of Fama and French (2001) that companies' propensity of paying dividends is changing essentially, but this is not consistent with Denis and Osobov (2008) who do not rule out a possibility that companies in their sample countries do not substantially change their dividend policies since they only found small propensity declines.

Table 5-7 Estimated Propensity to Pay Dividends for Forecast Period 1996-2010 (%)

Fama and French (2001) originally propose this method of measuring the propensity to pay dividends. Exp refers to the expected percent of dividend payers in year t, which is estimated by applying the coefficients (listed in Table 5-6) from the logistic panel regression for base period of 1989-1995 to the values of the explanatory variables for each firm in year t, averaging over firms. Actual refers to the actual percent of dividend payers in year t. Error refers to the forecast error that is calculated as Exp-Actual.

	US			Canada			UK			Germany			France			Japan			HK		
Year	Exp	Actual	Error	Exp	Actual	Error	Exp	Actual	Error	Exp	Actual	Error	Exp	Actual	Error	Exp	Actual	Error	Exp	Actual	Error
1996	42.49	30.69	11.80	45.51	1.17	5.66	80.96	81.14	-0.17	74.51	69.92	4.59	75.84	72.86	2.98	86.59	83.69	2.90	83.16	78.29	4.87
1997	41.38	29.29	12.10	43.02	1.90	8.88	79.35	78.61	0.75	74.88	67.20	7.68	74.87	65.83	9.04	87.88	84.71	3.17	83.82	75.45	8.37
1998	42.40	26.70	15.70	43.73	12.21	18.48	78.00	78.31	-0.31	75.12	71.65	3.47	73.88	62.79	11.09	86.61	82.74	3.87	76.23	69.14	7.09
1999	37.98	25.04	12.94	42.58	14.84	22.26	75.75	75.93	-0.18	74.77	69.72	5.05	72.30	64.20	8.09	81.62	76.59	5.03	72.91	51.77	21.14
2000	40.19	23.32	16.87	40.74	16.30	25.56	68.68	64.68	4.01	73.81	55.83	17.98	68.19	53.43	14.75	80.94	78.09	2.85	71.08	49.69	21.39
2001	43.65	22.55	21.11	40.23	18.26	28.04	70.32	57.93	12.39	63.33	49.00	14.33	69.28	55.85	13.43	78.56	79.96	-1.41	65.26	41.48	23.78
2002	46.53	22.56	23.97	41.07	16.57	25.51	69.88	55.24	14.64	58.86	42.79	16.07	69.03	52.81	16.22	72.79	76.64	-3.86	63.75	40.95	22.80
2003	42.46	25.95	16.50	38.29	10.82	22.53	68.86	54.12	14.73	60.58	38.05	22.54	70.35	53.27	17.08	77.36	79.58	-2.23	64.41	43.34	21.07
2004	40.28	27.84	12.43	34.39	6.51	22.13	67.55	50.73	16.82	63.74	37.62	26.12	71.05	52.61	18.44	84.85	84.10	0.76	68.35	49.17	19.18
2005	41.36	29.47	11.90	33.52	3.47	19.94	65.97	45.71	20.27	65.33	42.22	23.10	70.70	52.87	17.83	86.19	85.54	0.65	70.64	53.08	17.56
2006	40.76	29.88	10.88	34.84	3.04	18.19	64.86	44.06	20.80	65.68	43.71	21.97	70.47	52.46	18.01	86.92	86.03	0.90	70.30	52.03	18.27
2007	41.17	30.13	11.04	34.91	6.06	21.15	66.51	44.52	21.99	68.76	41.61	27.14	70.64	52.83	17.81	87.93	86.36	1.56	71.07	53.48	17.59
2008	48.44	30.80	17.64	43.13	13.90	20.77	72.09	46.87	25.22	64.61	44.90	19.71	68.59	56.02	12.57	84.62	86.11	-1.49	71.48	55.37	16.11
2009	46.81	28.42	18.38	42.81	12.72	19.91	71.98	47.32	24.66	62.65	41.60	21.06	67.56	48.28	19.28	73.96	79.11	-5.15	70.89	46.49	24.40
2010	44.43	30.58	13.84	37.59	6.96	19.37	72.85	45.80	27.05	68.53	45.78	22.75	70.71	54.79	15.91	81.92	80.80	1.13	74.17	54.90	19.27
Mean	42.69	27.55	15.14	39.76	9.65	19.89	71.57	58.06	13.51	67.68	50.77	16.90	70.90	56.73	14.17	82.58	82.00	0.58	71.84	54.31	17.53
Median	42.40	28.42	13.84	40.74	10.82	20.77	70.32	54.12	14.73	65.68	44.90	19.71	70.64	53.43	15.91	84.62	82.74	0.90	71.07	52.03	19.18
σ	2.84	3.01	3.92	3.90	5.81	5.85	4.98	13.96	10.17	5.67	12.56	8.07	2.42	6.63	4.65	4.99	3.51	2.90	5.85	11.43	6.07

5.5 Determinants on Dividends and Share Repurchases

5.5.1 Explanatory Variables

In this section, I investigate more factors influencing the dividend patterns. Unlike previous studies that focus on only cash dividends, I also analyse share repurchases. I focus on two aspects of payout policies: (1) whether to pay dividends and to repurchase shares; (2) the amounts of dividends and repurchases.

In addition to the variables used to explain the propensity to pay dividends, more variables are included to investigate payout policies. In particular, I expect that cash holdings (*CTAT*) have negative effect on cash dividends and positive effect on repurchase. Eije and Megginson (2008) provide results that are consistent with this prediction while they do not detail relevant argument. If companies require high liquidity of cash flows, they will be less likely to use dividend payout as a payout channel, and thus cash holdings are negatively connected with dividend distribution. On the contrary, larger cash holdings may lead to higher likelihood to repurchase shares because share repurchasing is a flexible means of distributing temporary free cash flows (Lee and Suh, 2011). Consistent with this concept, DeAngelo, DeAngelo and Stulz (2006) and Lee and Suh (2011) find that share repurchases are significantly associated with large cash holdings. I also expect that R&D activities (*R&D*) have negative effect on cash dividends and repurchases. Free cash flow theory predicts that R&D expenditure reduces the residual capital and will adversely affect corporate payouts. Finally, following the catering theory, I expect companies to be more likely to pay dividends when investors put a price premium (*VDP* and *EDP*) on dividend-paying firms. However, relevant evidence in prior research is controversial. Eije and Megginson (2008) find that the catering proxy has a negative relationship with the probability of paying dividends, in line with the predictions of catering theory. In contrast, Ferris, Jayaraman and Sabherwal (2009) present evidence that supports catering theory.

I also use several innovative dummy variables, which are not used in competing studies, to examine cash dividends and share repurchases. According to the free cash flow theory, high technology intensity (*HITECH*) should have a substantially negative effect on excess capital, and firms operating in the high technology sector are traditionally expected to be reluctant to pay dividends or to repurchase shares, as most of their capital is used to sustain high growth.

Moreover, few previous studies have tried to link merger and acquisition (*M&A*) practices to dividends and share repurchases. Jeon, Ligon and Soranakom (2010) discussed how the pre-merger dividend policies of acquirer and target affect the choice of payment method of M&A between stock takeover and cash takeover[138]. However, to my knowledge, preceding literature lacks the analysis concerning the effect of dividends and repurchases on the incidence of M&A. Several conjectures may be raised. It is interesting to investigate whether dividend payers face a greater or smaller risk of being taken over relative to non-dividend payers. It could be argued that target companies obtain final dividends in the form of an acquisition premium, and, accordingly, M&A is a substitute for dividends. This conjecture implies that listed firms that do not pay dividends are more likely to become targets of acquisitions. On the other hand, M&A operation may be considered as an expansionary investment that reduces the likelihood of acquirers paying out excess cash flows. Those listed firms with long-term strategy to acquire other firms would prefer repurchases to dividends in order to maintain sufficient cash flow which can be flexibly used since, as Jeon et al. (2010) argued, internally generated cash flow should be first-order choice according to pecking order theory of Myers (1984). This argument suggests that the incidence of becoming an acquirer is negatively associated with dividends but positively associated with repurchases. In addition, the alternative supposition could be that dividend payments attached with acquirers would ease the acceptance of M&A offer in some circumstances where investors (especially target shareholders) welcome dividends. Following this idea, the incidence of becoming an acquirer is positively associated with dividends.

To test for the impact of M&A on dividends, I construct four variables. *ACQUIERER* takes on the value of 1 if a sample company became an acquirer between 1989 and the end of 2011 and 0 otherwise for its all sample years. *TARGET* takes on the value of 1 and 0 otherwise for its all sample years if a company in my sample became a target firm between 1989 and the end of 2011. *TIN3* equals to 1 if M&A takes place

[138] Jeon, Ligon and Soranakom (2010) set out two main hypotheses. First, if the acquirer and the target take very different dividend policies prior to an M&A case, the acquisition payment would be in form of cash. The underlying reason is as following. In a stock-based takeover, the dissimilarity in dividend policies will bring about pronouncing liquidity demand of investors due to dividend clientele. The change of clientele base is costly because of transaction cost and probably come with adverse effect on price movement. Conversely, if the pre-merger dividend policies being taken by involved firms are quite similar, stock takeover would be more favorable than cash takeover. The second hypothesis is that the announcement return will be negatively affected by the extent of difference in dividend policies of the acquirer and the target for stock-based mergers. The authors find evidence to support the two hypotheses.

within 3 years of observed year for an acquirer. *TAKENIN3* equals to 1 if M&A takes place within 3 years of observed year for a target firm. *ACQUIERER* and *TARGET* are designed to measure the long-term effect, while *TIN3* and *TAKENIN3* are degined to measure the short-term effect. However, Datastream only provides the last record of M&A for an acquirer, while it is practically common for an acquirer to takeover several different target companies in practice. Consequently, *TIN3* is not an accurate variable and therefore I mainly employ *ACQUIERER* and *TARGET* in multivariate regressions.

Previous studies also do not relate payout policies to the practice of delisting. The common reasons of delisting can be attributable to the intention to move away from the regulations of capital market, the change of business strategy, the failure to meet the requirement of capital market, bankrupt or M&A. However, the data used in this study do not identify the real motivations of delisting for each individual delisted firm. If the delisting risk results mainly from financial distress, it is expected that delisting to be negatively related the probability of dividend payment and share repurchases. As DeAngelo and DeAngelo (1990) and DeAngelo et al. (1992) argued, firms facing financial distress tend to cut dividends. If listed firms leave public market on their own for avoiding external monitoring, a low probability of paying dividends is expected as well because prior to delisting the management may dislike dividends which force firms to be censored by the market (Easterbrook, 1984). To indicate delisting risk, I add a dummy variable, *DLIN3*, which is equal to 1 if an observed firm is delisted (the cases of mergers or takeovers are excluded) within 3 years of year t and 0 otherwise.

Table 5-8 presents the descriptive statistics of the variables used to explain firms' decisions of dividends and share repurchases over the full sample period 1989-2010 and two sub-periods 1989-2000 and 2001-2010. In estimating the significance of changes in firm characteristics over time, I use the method developed by Jungqvist and Wilhelmy (2003) which has been detailed in section 5.4.1. The results show that changes over time are significant for the majority of variables with the exceptions of cash (*CTAT*) in Germany and R&D in Hong Kong. Except for in the UK, firm age (*AGE*）in the second sub-period 2001-2010 is on average greater than in the first sub-period 1991-2000. *CTAT* shows a general increasing trend, except for in Japan. Besides, the most noticeable finding is that investment in R&D increases across all countries. There are no uniform time trends for dividend caterings, *VDP* and EDP.

In addition, **Table 5-8** shows that high technology firms (*HITECH*) accounted for a higher fraction of firms in all countries from the sub-period 1989-2000 to the sub-period 2001-2010. In particular, the most distinct increase in high-technology firms occurred in the three European countries, France, Germany and the UK. However, the frequency of *ACQUIERER* and *TARGET* decreases significantly across all countries, with the exception of France, where the average percentage of acquirers went up. Both in the US (from 31.68% to 2.99%) and in Canada (from 26.11% to 1.31%) companies experienced the steepest decline of target firms. Similarly, *TIN3* and *TAKENIN3* showed a significant declining trend in the US and in Canada. Contrastingly, there are insignificant increasing values for *TIN3* and *TAKENIN3* in the UK. One remarkable finding is that all countries uniformly experienced the great increase in de-listing rates (*DLIN3*). For instance, the value of *DLIN3* rose from 0.68% to 8.91% in the U.S., and from 12.17% to 17.93% in the UK.

Table 5-8 Descriptive Statistics on Further Firm Characteristics

This table shows the means and medians of firm characteristics used in the test on the propensity to pay dividends for two sub-periods 1989-2000 and 2001-2010 and full sample period 1989-2010. The numbers reported under "Frequency Distribution of Firm Characteristics (%)" represent the proportions of the firm-year observations that are associated with a certain characteristics over a period. For example, 42.24% of the US firm-year observations are from high technology industries over 1989-2000. The last column reports the significance of changes in firm characteristics over time, which is estimated from random-effects, generalized least squares (GLS) regressions with corrected cluster error and the original model developed by Jungqvist and Wilhelmy (2003). The definitions of variables are as following: *AGE* represents the number of years between base year and the observed year. *CTAT* is the ratio of cash to total assets in which cash represents the money available for use in the normal operations of the company. *R&D* is the proxy of R&D expenditure, measured as the amount of R&D divided by total assets. Following Baker and Wurgler (2004a), dividend premium is calculated as the difference between the logarithm of the market to book value of dividend payers and that of non-dividend payers. *VDP* means the value-weighted dividend premium and *EDP* means equally weighted dividend premium. *ACQUIERER* takes on the value of 1 and 0 otherwise for its all sample years if a sample company became an acquirer between 1989 and the end of 2011. *TARGET* takes on the value of 1 and 0 otherwise for its all sample years if a company in my sample became a target firm between 1989 and the end of 2011. *TIN3* equals to 1 if M&A occurs within 3 years of observed year for an acquirer. *TAKENIN3* equals to 1 if M&A takes place within 3 years of observed year for a target firm. *DLIN3* equals 1 if an observed firm is delisted within 3 years of year t and 0 otherwise. A notable flaw in data is that DataStream only provides the last record of M&A for an acquirer, while it is common for an acquirer to takeover several different target companies in practice. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

	1989-2000		2001-2010		1989-2010		
Variable	Mean	Median	Mean	Median	Mean	Median	Significance
			US				
	N=31154		N=34853		N= 69281		
AGE	11.271	9.000	14.507	12.000	12.890	10.000	***
CTAT	0.050	0.000	0.084	0.012	0.067	0.004	***
R&D	0.039	0.000	0.050	0.000	0.044	0.000	***
VDP	0.035	0.024	0.0307	0.0312	0.0327	0.0240	***
EDP	-0.208	-0.186	-0.1221	-0.1475	-0.1652	-0.1636	***
			Frequency Distribution of Firm Characteristics (%)				
HITECH	42.24		47.54		44.89		
ACQUIRER	11.98		10.41		11.20		
TARGET	32.39		2.99		17.69		
TIN3	3.36		0.63		1.99		
TAKENIN3	13.38		2.07		7.72		
DLIN3	0.65		8.91		4.78		
			Canada				
	N=3477		N=7875		N=11779		
AGE	10.974	10.000	12.207	11.000	11.799	11.000	***
CTAT	0.021	0.000	0.051	0.000	0.041	0.000	***
R&D	0.013	0.000	0.029	0.000	0.024	0.000	***
VDP	0.015	0.0004	-0.0992	-0.0725	-0.0615	-0.0407	***
EDP	-0.263	-0.1942	-0.3917	-0.4326	-0.3490	-0.3598	***
			Frequency Distribution of Firm Characteristics (%)				
HITECH	20.80		21.85		21.50		
ACQUIRER	4.30		1.92		2.71		
TARGET	27.79		1.31		10.09		
TIN3	1.05		0.18		0.47		
TAKENIN3	10.71		0.99		4.21		
DLIN3	1.95		15.89		11.27		
			UK				
	N=12392		N=13979		N=28319		
AGE	15.567	12.000	13.865	8.000	14.727	10.000	***
CTAT	0.086	0.037	0.156	0.077	0.121	0.055	***
R&D	0.010	0.000	0.026	0.000	0.018	0.000	***
VDP	0.046	0.052	0.1089	0.1084	0.0772	0.0744	***
EDP	-0.269	-0.207	-0.3027	-0.2901	-0.2858	-0.2828	***
			Frequency Distribution of Firm Characteristics (%)				
HITECH	22.19		29.57		25.83		
ACQUIRER	6.97		4.15		5.58		
TARGET	8.12		4.27		6.22		
TIN3	0.32		1.12		0.72		
TAKENIN3	1.12		2.27		1.69		
DLIN3	10.52		17.93		14.18		
			Germany				
	N=3585		N=5806		N=9813		

AGE	11.133	9.000	11.763	9.000	11.506	9.000	***
CTAT	0.059	0.032	0.072	0.025	0.067	0.029	
R&D	0.009	0.000	0.021	0.000	0.016	0.000	***
VDP	-0.048	-0.014	-0.0573	-0.0616	-0.0533	-0.0427	***
EDP	-0.131	-0.041	-0.0166	-0.0259	-0.0632	-0.0259	***
Frequency Distribution of Firm Characteristics (%)							
HITECH	26.004		42.59		35.82		
ACQUIRER	0.724		0.28		0.46		
TARGET	1.123		0.28		0.62		
TIN3	0.025		0.00		0.01		
TAKENIN3	0.374		0.14		0.23		
DLIN3	4.018		5.67		4.99		
France							
	N=4203		N=5921		N=10589		
AGE	7.972	6.000	10.942	9.000	9.632	8.000	***
CTAT	0.044	0.03	0.055	0.034	0.050	0.032	***
R&D	0.005	0.000	0.014	0.000	0.010	0.000	***
VDP	0.041	0.043	0.0458	-0.0314	0.0435	0.0434	***
EDP	-0.071	-0.003	-0.0662	-0.0641	-0.0685	-0.0641	***
Frequency Distribution of Firm Characteristics (%)							
HITECH	26.82		40.23		34.32		
ACQUIRER	1.03		1.15		1.10		
TARGET	1.44		1.03		1.21		
TIN3	0.02		0.25		0.15		
TAKENIN3	0.09		0.49		0.31		
DLIN3	7.41		9.04		8.32		
Japan							
	N=17660		N=21602		N=41614		
AGE	13.913	12.000	19.172	18.000	16.643	16.000	***
CTAT	0.107	0.090	0.097	0.071	0.102	0.081	***
R&D	0.007	0.000	0.014	0.004	0.011	0.001	***
VDP	0.077	0.053	0.0583	0.0351	0.0671	0.0530	***
EDP	-0.016	-0.015	-0.1404	-0.1038	-0.0805	-0.0326	***
Frequency Distribution of Firm Characteristics (%)							
HITECH	32.60		34.89		33.78		
ACQUIRER	1.68		1.48		1.58		
TARGET	2.14		0.36		1.22		
TIN3	0.19		0.27		0.23		
TAKENIN3	0.32		0.28		0.30		
DLIN3	0.99		4.97		3.06		
HK							
	N=2491		N=8230		N=10856		
AGE	9.276	8.000	11.004	10.000	10.586	9.000	***
CTAT	0.089	0.047	0.149	0.105	0.135	0.091	***
R&D	0.001	0.000	0.004	0.000	0.003	0.000	
VDP	-0.141	-0.091	-0.0610	-0.0698	-0.0803	-0.0698	***
EDP	-0.037	-0.029	-0.2417	-0.2156	-0.1922	-0.2118	**
Frequency Distribution of Firm Characteristics (%)							
HITECH	12.53		20.97		18.93		
ACQUIRER	0.00		0.00		0.00		
TARGET	0.00		0.00		0.00		
TIN3	0.00		0.00		0.00		
TAKENIN3	0.00		0.00		0.00		
DLIN3	1.87		2.14		2.07		

5.5.2 Likelihood to Pay Dividends and Likelihood to Repurchase Shares

This part of study investigates the likelihood of dividends and repurchases. In contrast to previous studies[139], I follow Petersen (2009) and use the logistic panel regressions corrected clustered standard errors in two dimensions of firm and year to strengthen robustness for panel data analysis. The dependant variable takes value of 1 if a firm paid dividend in a year *t* and 0 otherwise.

Table 5-9, Panel A. presents the results of logistic panel regressions concerning the decision to pay dividends. The estimated coefficients for size, profitability and the earned/contributed capital mix are statistically significant and show positive signs in all countries. Again, in line with Denis and Osobov (2008), the effect of growth opportunities on the decision of firms to pay dividends is relatively mixed. The slope coefficients of *MTBV* and *GOA* are not significant in Germany and Japan, respectively, but negative and significant in the other countries as expected. In line with Eije and Megginson (2008), leverage proved to have a significantly negative effect on the decision of a firm to pay dividends in all countries except in Canada. In line with the predictions of life cycle theory, firm age (*LNAGE*) had a positive effect in regressions for the majority of the observed countries. In the US, Canada, UK and in Germany cash holdings (*CTAT*) are observed to be negatively related the decision to pay dividends, consistent with expectation. High technology firms are generally less likely to pay dividends in the US, Germany, France and in Hong Kong, while the effect of technology intensity (*HITECH*) is not significant in Canada, the UK and in Japan. Furthermore, when equally weighted dividend premium (*EDP*) is used as proxy, the impact is relatively weak. It is only in Hong Kong that the coefficient is positive and significant.

The effects of M&A factors on dividend decisions differ across countries. US acquirers appeared to be reluctant to pay dividends, as the coefficient of *ACQUIRER* is significantly negative, unlike the corresponding results in the UK and in Germany. Moreover, the results show that target firms in the US and in the UK are more likely to pay dividends. In contrast, the estimated coefficients of *TARGET* are significant and negative in Canada and Japan. Therefore, overall, there did not seem to be a consistent relationship between M&A and dividend policy across different countries. Evidence in

[139] Eije and Megginson (2008) use random-effects logistic panel regression with bootstrapping 500 times to examine the influential factors of the decisions of dividends and repurchases. More recently, Lee and Suh (2011) use tobit regression model to examine a series of variables in determining the amount of repurchase.

respect of the effects of de-listing risk on dividend policy is clear and uniform in all sample countries. The associated coefficients are significantly negative for all economies except in the UK, for which the coefficient is negative but not significant.

Table 5-9, Panel B. shows the results of logistic panel regressions concerning the decision of share repurchase. Because all countries apart from the US had a limited number of repurchases observations before the late of 1990s, the sample period is 1989-2010 for the US, and 1999-2010 for Canada, UK, Germany, France, Japan and Hong Kong. The results show that the overall explanatory power of repurchase regressions is lower than that of dividends regressions, as can be seen from the smaller values of χ^2 in repurchase regressions than those in dividend regressions. Meanwhile, there are fewer significant covariate coefficients in Panel B as shown in Panel A. This may be because the number of observations of repurchases is relatively small except for the US.

The results show that, whilst the coefficients of firm size (*SIZE*) are positive and significant in the UK, Germany, France and Japan, the results indicate that it is not a strong determinant of share repurchases in the US. The results also indicate that profitable (*PROFIT*) firms in the US, Canada and in the UK tend to repurchase shares. High growth (*MTBV*) firms in the US, Canada and in Japan are less likely to repurchase shares. For the UK and France, a higher growth rate of total assets (*GOA*) leads to a lower likelihood of repurchasing shares. Fraction of retained earnings to total equity (*RETE*) is positively related to the decision to repurchase shares in the US, Canada and in the UK.

Regression results suggest that debt ratio (*LEVERAGE*) is negatively related to the decision to repurchase shares in the US, France and in Japan. Established firms are more likely to repurchase shares, as the coefficients of age (*LNAGE*) are significant and positive for all countries except in Japan. In line with Lee and Suh (2011), and Eije and Megginson (2008), the likelihood of repurchases is positively associated with cash holdings (*CTAT*) for Canada, the UK and Hong Kong, while the coefficient for the US is positive but insignificant. Whilst the slope coefficients for technology focus (*HITECH*) are significantly positive for Canada, Germany and France, the effect of high technology is not statistically significant for the US and in the UK.

The effects of M&A factors on repurchase decisions are heterogeneous across countries. In the US and in the UK, acquirers (*ACQUIRER*) are more likely to repurchase shares. In contrast, acquirers in Japan are reluctant to repurchase shares if they are defined as acquirers. In the US and in the UK, there is no evidence to suggest that the likelihood to repurchase shares is related to whether or not a firm is an M&A target (*TARGET*). Besides, the coefficients of *TARGET* are significantly positive for Germany but significantly negative for France and Japan. The negative effect of a delisting risk (*DLIN3*) on the propensity to repurchases can be seen in Germany and in Japan. In addition, in this part of the study, the dummy variable *IFDIV* is used as an additional explanatory factor. The results indicate that firms that repurchase shares tend to be dividend payers at the same time as the coefficients of *IFDIV* are significantly negative, with the exception of Germany and France for which the relevant significance of coefficients is low.

Table 5-9 Logistic Panel Regressions on the Likelihood to Pay Dividends and Repurchase Shares

This table presents results from estimating logistic panel regressions for seven economies over sample period 1989-2010. Suggested by Petersen (2009), standard errors are corrected in two dimensions of firm and year. The dependent variable equals one if the firm pays dividends in year t and zero otherwise in Panel A. The dependent variable equals one if a firm repurchases shares in year t and zero otherwise in Panel B. The specifications of explanatory variables are as follows. *SIZE* is a measure of firm size, which represents the percent of firms with smaller market capitalization in each stock market for every sample year. *PROFIT*, the proxy of profitability, is calculated as (book value of total assets - book value of equity + market value of equity)/book value of total assets. *MTBV*, a proxy of growth opportunities, is measured as the market value of total capital scaled by the book value of total assets. *GOA*, a proxy of growth opportunities, represents the annual growth rate of total assets. *RETE* refers to ratio of earned equity, which is measured as retained earnings scaled by total book equity. *LEVERAGE* is measured as long-term debt scaled by book value of total assets. *LNAGE* represents the logarithm of the number of years between base year and the observed year. CTAT is the ratio of cash to total assets in which cash represents the money available for use in the normal operations of the company. *HITECH* takes on the value of 1 if a sample firm is categorized to high technology industry and 0 otherwise. *ACQUIERER* takes on the value of 1 if a sample company became an acquirer between 1989 and the end of 2011 and 0 otherwise for its all sample years. *TARGET* takes on the value of 1 and 0 otherwise for its all sample years if a company in my sample became a target firm between 1989 and the end of 2011. *TIN3* equals to 1 if M&A takes place within 3 years of observed year for an acquirer. *TAKENIN3* equals to 1 if M&A takes place within 3 years of observed year for a target firm. *DLIN3* equals 1 if an observed firm is delisted within 3 years of year t and 0 otherwise. *EDP*, dividend premium, is calculated as the difference between the logarithm of the average market to book value of dividend payers and that of non-dividend payers (Baker and Wurgler, 2004a). *IFDIV* equals 1 if a repurchasing company is paying dividends and 0 otherwise. The *p*-values are reported in parentheses and significance levels are indicated. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	US	Canada	UK	Germany	France	Japan	HK
Panel A. Logistic Panel Regressions on the Likelihood to Pay Dividends							
Intercept	-3.454***	-1.136***	-0.766**	-1.285***	-0.356	2.191***	-0.139
	(0.00)	(0.00)	(0.04)	(0.01)	(0.29)	(0.00)	(0.49)
SIZE	2.906***	2.867***	2.27***	2.173***	2.913***	2.59***	2.918***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PROFIT	0.356***	4.999***	5.349***	4.356***	9.37***	11.542***	6.519***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
MTBV	-0.191***	-0.512***	-0.285***	-0.066	-0.394***	-0.91***	-0.464***
	(0.00)	(0.00)	(0.00)	(0.3)	(0.00)	(0.00)	(0.00)
GOA	-0.425***	-0.821***	-0.475***	-0.325**	-0.322***	0.473	-0.457***
	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.22)	(0.00)
RETE	0.633***	0.534***	0.771***	0.843***	1.044***	2.244***	1.346***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LEVERAGE	-0.39*	0.963**	-0.698**	-0.702*	-0.976**	-2.068***	-2.012***
	(0.06)	(0.03)	(0.02)	(0.09)	(0.02)	(0.00)	(0.00)
LNAGE	0.856***	0.052	0.665***	0.369***	0.045	-0.244***	0.116*
	(0.00)	(0.65)	(0.00)	(0.00)	(0.71)	(0.01)	(0.07)
CTAT	-2.826***	-2.594***	-2.301***	-0.872**	-1.04	0.913*	0.631**
	(0.00)	(0.00)	(0.00)	(0.05)	(0.24)	(0.07)	(0.05)
HITECH	-0.884***	-0.179	-0.11	-0.256**	-0.454***	0.136	-0.434***
	(0.00)	(0.31)	(0.19)	(0.03)	(0.00)	(0.16)	(0.00)
ACQUIRER	-0.191*	-0.262	0.548***	1.161**	0.021	-0.453	-
	(0.08)	(0.46)	(0.00)	(0.05)	(0.97)	(0.18)	-
TARGET	0.315***	-0.521***	0.422**	-0.371	-0.406	-0.657***	-
	(0.01)	(0.01)	(0.02)	(0.18)	(0.28)	(0.01)	-
DLIN3	-0.388***	-0.725***	-0.174	-0.355*	-0.41***	-1.276***	-0.465**
	(0.00)	(0.00)	(0.15)	(0.06)	(0.01)	(0.00)	(0.05)
EDP	1.159	0.945	0.223	-0.95*	0.949	-1.961***	3.479***
	(0.17)	(0.17)	(0.78)	(0.06)	(0.31)	(0.00)	(0.00)
Obs	64261	11779	28319	9813	10589	41614	10856

χ2	14301.98	1911.54	5459.33	2117.19	2066.48	5699.97	2173.81
Pseudo R-sq	0.315	0.314	0.418	0.273	0.295	0.339	0.376
Panel B. Logistic Panel Regressions on the Likelihood to Repurchase Shares							
Intercept	-2.241***	-2.352***	-4.242***	-5.601***	-5.701***	-3.014***	-3.705***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
SIZE	0.293	-0.258	0.666***	1.182*	1.591***	1.672***	0.253
	(0.12)	(0.35)	(0.00)	(0.07)	(0.00)	(0.00)	(0.52)
PROFIT	0.121***	0.966***	1.521***	-0.059	1.21	-0.929	0.023
	(0.00)	(0.00)	(0.00)	(0.94)	(0.23)	(0.42)	(0.95)
MTBV	-0.162***	-0.299***	-0.029	-0.102	-0.213	-1.385***	-0.323***
	(0.00)	(0.00)	(0.47)	(0.36)	(0.17)	(0.00)	(0.01)
GOA	-0.839***	-0.55***	-0.84***	-0.48	-0.837***	-1.572**	-0.131
	(0.00)	(0.00)	(0.00)	(0.19)	(0.00)	(0.02)	(0.46)
RETE	0.548***	0.398***	0.169***	0.154	0.186	0.268**	0.097
	(0.00)	(0.00)	(0.00)	(0.32)	(0.12)	(0.05)	(0.22)
LEVERAGE	-0.41***	0.323	0.361	-0.688	-1.156*	-0.945*	-0.225
	(0.00)	(0.37)	(0.35)	(0.36)	(0.08)	(0.1)	(0.71)
LNAGE	0.343***	0.266***	0.427***	0.433**	0.752***	0.108	0.342***
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.44)	(0.00)
CTAT	0.392	1.615***	0.586**	1.352	-0.006	0.329	1.572***
	(0.16)	(0.00)	(0.03)	(0.31)	(0.997)	(0.49)	(0.00)
HITECH	-0.079	0.644***	-0.005	0.535***	0.328***	-0.068	-0.1
	(0.19)	(0.00)	(0.96)	(0.01)	(0.01)	(0.5)	(0.52)
ACQUIRER	0.132**	-0.263	0.276*	-	-	-0.606***	-
	(0.03)	(0.26)	(0.099)	-	-	(0.01)	-
TARGET	-0.115	0.172	-0.017	2.258***	-0.627*	-0.759*	-
	(0.13)	(0.42)	(0.9)	(0.00)	(0.08)	(0.07)	-
DLIN3	0.044	0.007	0.011	-0.827**	0.18	-0.369*	-0.31
	(0.49)	(0.96)	(0.9)	(0.03)	(0.57)	(0.07)	(0.59)
IFDIV	0.311***	0.522***	0.62***	-0.091	0.187	0.648***	0.632***
	(0.00)	(0.00)	(0.00)	(0.62)	(0.45)	(0.00)	(0.00)
Obs	59790	8291	15760	6320	6409	24348	7292
χ2	4572.06	367.52	780.62	53.58	265.44	527.77	129.76
Pseudo R-sq	0.099	0.093	0.120	0.048	0.103	0.068	0.044

5.5.3 Amounts of Dividends and Repurchases

In this section, I use OLS panel regressions to explore whether the determinants of the propensity for firms to pay dividends can also be used to explain the amounts of dividends and repurchases. Again, as suggested by Petersen (2009) the clustered standard errors for the two elements of firm and year, are corrected in the estimations. This sample for this section consists of firms that paid cash dividends or repurchased shares. Firms without payouts are excluded. The specification of OLS pooled regression model is given as:

$$y_{it} = \alpha + \beta_i X_{it} + \varepsilon_{it} \qquad (5-1)$$

The dependent variable y_{it} is the dividend ratio which is the cash dividends paid scaled by total assets, or the repurchase ratio which is the share repurchases scaled by total assets[140]. X_{it} represents the vector of control variables for each firm-year observation. ε_{it} represents unobserved random factors including firm-specific and time-specific shocks[141].

Table 5-10 Panel A shows the results from regressions in respect of dividends. The dependent variable used is dividend ratio, which is cash dividends paid scaled by total assets for a firm-year observation. The results indicate that profitability (*PROFIT*) and growth rate of total assets (*GOA*) are important factors in determining dividend amounts. The coefficients of market to book ratio (*MTBV*) are uniformly positive in all countries, indicating that firms with high market to book ratio did not pay dividends, but when they did they paid more. This finding is consistent with Aivazian and Booth (2003), Chay and Suh (2009) and Alzahrania and Lasfer (2012) who also find the positive effect of market to book ratio on dividend amount. This may imply market to book ratio (*MTBV*) and growth rate of total assets (*GOA*), which is the alternative proxy variable of growth opportunity, carry different information essentially. An interesting finding is that large US companies (*SIZE*) are less likely to pay high dividends, consistent with Aivazian and Booth (2003) who find the negative relation between the ratio of dividends to total assets and size in some countries A possible explanation is that US firms prefer to distribute substantial amounts of cash through repurchases. On the contrary, firm size is still positively related the dividend amounts paid by UK

[140] Aivazian and Booth (2003), Lee and Suh (2011) and Alzahrania and Lasfer (2012) have used the same measure to investigate dividends or repurchases.

[141] There are three assumptions for the error term ε_{it} $[\mu = 0]$: (i) No autocorrelation $\text{cov}(\varepsilon_{it}, \varepsilon_{is}) = 0$ (ii) Homoskedasticity $\text{var}(\varepsilon_{it}) = \sigma^2$ (iii) Cross-section independence $\text{cov}(\varepsilon_{it}, \varepsilon_{jt}) = 0$

companies.

The sign of the coefficient of *LEVERAGE* is consistently negative in each regression except for in the US for which the significance is lower than standard, indicating that firms with high leverage are less likely to distribute large amount of dividends. Firm age had a significantly negative impact on the ratio of dividends to total assets in the US and in Canada, whilst it had a positive impact in the UK. Cash holding (*CTAT*) is significantly positive in most regressions, which contrasted with indicators relating to the decision to pay dividends. This result suggests that firms with high cash holdings are reluctant to pay dividends, but if they did, they paid more. The effect of high technology is significant only in the UK and in Japan.

In addition, there is weak statistical evidence to show whether a firm's decision to become an acquirer affect the amounts paid out in dividends. However, one exception is Japan where a significantly negative coefficient is recorded. US target firms are shown to prefer to pay lower dividends, and Japanese firms had the same tendency. The OLS regressions did not produce significant evidence to show whether the risk of de-listing (*DLIN3*) affected dividend amounts. Regression results for the US for equally weighted dividend premium (*EDP*) recorded a significantly positive coefficient, which is consistent the predictions of catering theory. However, the significance the catering effect could not be proved in regressions for other countries.

Table 5-10 Panel B. shows the results for repurchases. The dependent variable used is the repurchase ratio, which is the amount of repurchased shares scaled by total assets for a firm-year observation, as used by Lee and Suh (2011). Due to the data unavailability problems previously outlined, the sample period is 1989-2010 for the US, and 1999-2010 for Canada, UK, Germany, France, Japan and Hong Kong. The explanatory power of repurchase regressions is lower than that of dividends regressions because the values of F and R^2 are smaller (except R^2 for Germany). Consequently, there are less significant coefficients shown in **Table 5-10 Panel A**.

Market to book ratio (*MTBV*) is the only explanatory variable that is significant in the regressions for all countries. Interestingly, the coefficients of market to book ratio are all positive, which is similar to the findings of Lee and Suh (2011) who use the Tobit model to show that the amount of repurchases is positively related to market to book ratio for US companies. The other interesting finding is that firm size is a significantly positive coefficient in the US. This may indicate that large US firms prefer repurchases to paying dividends since **Table 5-10 Panel A.** shows that firm size has negative impact on the amount of dividends. Profitability is not proven to be a strong determinant of repurchase amounts; it is only associated with significant coefficient in regressions in France and Hong Kong. In addition, changes in total assets (*GOA*) recorded a significantly negative coefficient in the US results, whilst the coefficient of *GOA* in Hong Kong is positive and significant. The amounts of repurchases increased with retained earnings in the US, France and Japan, but not in Hong Kong, which showed an opposite trend.

Leverage has a relatively homogeneous effect in the different countries, in that firms with heavy debts are reluctant to repurchase large amounts of shares, as seen in the US, Canada, Japan and in Hong Kong. The relationship between the amount of repurchases and firm age is negative in the US but positive in Hong Kong. The UK is the only country where cash holdings (*CTAT*) had a significant influence on the amount of repurchased shares. However, the decision to repurchase is not affected by technology orientation (*HITECH*) in all sample countries.

Finally, M&A factors are not observed to have any effect on the repurchase ratio. The significant and positive coefficients of *DLIN3* in the US and in the UK suggest that firms facing de-listing risk tended to raise the repurchase ratio. In the US, if repurchasing firms are dividend payers, the amount of repurchases are comparatively lower, probably due to a substitute mechanism.

Furthermore, I estimate extra regressions to test for robustness of my results using alternative definitions of the explanatory variables. The results are reported in **Appendix 5-1**. In these regressions, High technology dummy (*HITECH*) is replaced with the ratio of R&D to total assets (*R&D*). *ACQUIRER* is replaced with a dummy variable taking on the value of 1 if a company merger or takeover other firm within 3 years since observed year (*TIN3*). *TARGET* is replaced with a dummy variable taking on the value of 1 if a company is taken over by other firm within 3 years since observed year (*TAKENIN3*). Like *HITECH*, *R&D* has strongly effect on the decision of whether to pay dividends. *TAKENIN3* has negative on the probabilities to pay dividends and the amount of dividends paid for some country. The effect of *TIN3* on dividend policy is weak, due to the data flaw[142] of this variable.

[142] Datastream only provides the last record of M&A for an acquirer, while it is common for an acquirer to takeover several different target companies in practice.

Table 5-10 OLS Panel Regressions on the Amount of Dividends and Share Repurchases

This table presents results from estimating OLS panel regressions for seven economies over sample period 1989-2010. Suggested by Petersen (2009), standard errors are corrected in two dimensions of firm and year. The specifications of explanatory variables are as follows. *SIZE* is a measure of firm size, which represents the percent of firms with smaller market capitalization in each stock market for every sample year. *PROFIT*, the proxy of profitability, is calculated as (book value of total assets - book value of equity + market value of equity)/book value of total assets. *MTBV*, a proxy of growth opportunities, is measured as the market value of total capital scaled by the book value of total assets. *GOA*, a proxy of growth opportunities, represents the annual growth rate of total assets. *RETE* refers to ratio of earned equity, which is measured as retained earnings scaled by total book equity. *LEVERAGE* is measured as long-term debt scaled by book value of total assets. *LNAGE* represents the logarithm of the number of years between base year and the observed year. *CTAT* is the ratio of cash to total assets in which cash represents the money available for use in the normal operations of the company. *HITECH* takes on the value of 1 if a sample firm is categorized to high technology industry and 0 otherwise. *ACQUIERER* takes on the value of 1 and 0 otherwise for its all sample years if a sample company became an acquirer between 1989 and the end of 2011. *TARGET* takes on the value of 1 if a company in my sample became a target firm between 1989 and the end of 2011 and 0 otherwise for its all sample years. *TIN3* equals to 1 if M&A takes place within 3 years of observed year for an acquirer. *TAKENIN3* equals to 1 if M&A takes place within 3 years of observed year for a target firm. DLIN3 equals 1 if an observed firm is delisted within 3 years of year t and 0 otherwise. *EDP*, dividend premium, is calculated as the difference between the logarithm of the average market to book value of dividend payers and that of non-dividend payers (Baker and Wurgler, 2004a). *IFDIV* equals 1 if a repurchasing company is paying dividends and 0 otherwise. *p*-values are reported in parentheses and significance levels are indicated. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	US	Canada	UK	Germany	France	Japan	HK
Panel A. The dependent variable is cash dividends over total assets							
Intercept	0.023***	0.034***	0.008***	0.014***	0.007***	0.004***	0.012***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
SIZE	-0.006**	-0.001	0.003***	-0.003	-0.002	-0.0003	-0.001
	(0.03)	(0.91)	(0.01)	(0.42)	(0.28)	(0.39)	(0.64)
PROFIT	0.006***	0.097***	0.04***	0.087***	0.109***	0.016***	0.106***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
MTBV	0.01***	0.01***	0.008***	0.006***	0.007***	0.002***	0.016***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GOA	-0.018***	-0.013***	-0.013***	-0.017***	-0.015***	-0.007***	-0.023***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RETE	-0.005***	-0.04***	0.004***	-0.012**	-0.006***	0.004***	-0.005*
	(0.00)	(0.00)	(0.00)	(0.02)	(0.01)	(0.00)	(0.09)
LEVERAGE	-0.004	-0.05***	-0.014***	-0.026***	-0.017***	-0.011***	-0.055***
	(0.29)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LNAGE	-0.002**	-0.004**	0.001***	0.001	0.002***	0.0002	0.001
	(0.05)	(0.04)	(0.00)	(0.38)	(0.01)	(0.23)	(0.56)
CTAT	0.044***	-0.013	0.021***	0.036***	0.009	0.006***	0.03***
	(0.00)	(0.53)	(0.00)	(0.01)	(0.31)	(0.00)	(0.00)
HITECH	-0.0003	-0.00032	-0.0029***	0.001	-0.001	0.0004**	-0.001
	(0.79)	(0.93)	(0.00)	(0.66)	(0.39)	(0.02)	(0.52)
ACQUIRER	-0.001	-0.001	-0.001	-0.005	0.001	-0.001***	-
	(0.34)	(0.87)	(0.44)	(0.39)	(0.78)	(0.01)	-
TARGET	-0.003**	-0.004	0.0004	-0.004	-0.002	-0.001**	-
	(0.04)	(0.48)	(0.68)	(0.4)	(0.49)	(0.04)	-
DLIN3	0.002	0.003	0.0001	-0.005	0.002	0.0005	0.008
	(0.26)	(0.54)	(0.93)	(0.19)	(0.11)	(0.24)	(0.16)
EDP	0.015***	-0.035*	-0.001	0.004	0.002	-0.002	0.013

	(0.00)	(0.07)	(0.58)	(0.52)	(0.45)	(0.11)	(0.14)
Obs	20908	3818	18573	5359	6414	34742	5975
F	106.77	43.71	213.55	15.15	52.07	468.76	111.60
R-sq	0.182	0.292	0.270	0.058	0.231	0.210	0.303
Panel B. The dependent variable is share repurchases over total assets							
Intercept	0.024***	0.055**	0.025	0.058	0.054***	-0.002	-0.037*
	(0.00)	(0.02)	(0.12)	(0.41)	(0.00)	(0.75)	(0.06)
SIZE	0.01***	-0.012	0.003	-0.125	-0.029***	0.002	-0.011
	(0.01)	(0.38)	(0.7)	(0.12)	(0.00)	(0.79)	(0.34)
PROFIT	0.001	-0.029	0.018	-0.106	0.069**	-0.019	-0.131**
	(0.57)	(0.16)	(0.45)	(0.45)	(0.05)	(0.38)	(0.04)
MTBV	0.019***	0.025***	0.017***	0.052**	0.017***	0.022***	0.035***
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
GOA	-0.015***	0.013	-0.005	-0.028	0.031	-0.014	0.021**
	(0.01)	(0.4)	(0.48)	(0.81)	(0.3)	(0.25)	(0.04)
RETE	0.007***	-0.007	0.001	-0.022	0.016*	0.004*	-0.02***
	(0.00)	(0.21)	(0.73)	(0.4)	(0.07)	(0.1)	(0.01)
LEVERAGE	-0.01*	-0.064*	0.003	-0.016	-0.021	-0.016**	-0.063**
	(0.08)	(0.09)	(0.69)	(0.84)	(0.54)	(0.03)	(0.02)
LNAGE	-0.005***	-0.01	-0.004	-0.011	-0.011	-0.001	0.012***
	(0.00)	(0.12)	(0.5)	(0.67)	(0.11)	(0.34)	(0.01)
CTAT	0.02	-0.074	0.044**	0.2	0.05	0.013	-0.005
	(0.13)	(0.12)	(0.04)	(0.36)	(0.5)	(0.13)	(0.86)
HITECH	0.0004	-0.007	0.001	0.038	-0.001	-0.001	0.001
	(0.78)	(0.38)	(0.88)	(0.27)	(0.89)	(0.24)	(0.9)
ACQUIRER	0.0005	0.006	-0.004	-	-	-0.004	-
	(0.79)	(0.67)	(0.53)	-	-	(0.3)	-
TARGET	-0.003	-0.011	-0.005	0.019	-0.003	-0.004	-
	(0.26)	(0.45)	(0.47)	(0.52)	(0.83)	(0.46)	-
DLIN3	0.005*	0.012	0.009*	0.137	0.026	0.003	0.002
	(0.1)	(0.48)	(0.1)	(0.24)	(0.21)	(0.13)	(0.68)
IFDIV	-0.013***	0.004	-0.007	0.022	-0.014	-0.001	0.007
	(0.00)	(0.56)	(0.49)	(0.56)	(0.38)	(0.65)	(0.34)
Obs	12132	946	1342	126	273	1483	469
F	85.84	4.84	4.99	2.05	3.25	9.27	1.85
R2	0.171	0.099	0.092	0.261	0.173	0.188	0.271

5.6 Firm Characteristics on Various Dividend Behaviors

This section begins with comparing a range of firm characteristics among three control groups: dividend increase, dividend decrease and dividend constant. Benartzi, Michaely and Thaler (1997) defined a dividend change as the difference in annual dividends between two continuous years, where the annual dividends are calculated as four times the last quarterly dividend per share for each observed year. Slightly different, the annual dividend is calculated by Guay and Harford (2000) as the sum of all quarterly dividends in each observed year. Accordingly, a dividend change in this study is defined to occur when a firm i exhibited change (i.e. increase, decrease or constant) in dividend per share from year t-1 to year t. Dividend initiation and dividend omission are not included as dividend changes. **Table 5-11-A,** summarizes the means and medians of firm characteristics across these groups. The t-statistics of the difference in means between dividend increase group and dividend decrease group are displayed in the last row. The results show that the number of companies decreasing dividends is much smaller than that of companies increasing dividends, consistent with the suggestion of Lintner (1956) that companies pursue stable dividend policy and avoid dividend cut. For example, in the US, the number of the US firms is 630 for decrease dividends group versus 8793 for dividend increase group and 7470 for dividend constant group.

Some universal relations between dividend changes and firm characteristics across countries are found from the results. Firms that increase dividends are larger (*SIZE*), more profitable (*PROFIT*), and have higher growth opportunities (*MTBV* and *GOA*), retained earnings to total equity ratios (*RETE*) and cash holdings (*CTAT*) than other firms. One exception is that, for the US, although the mean profitability of dividend increase group is lower than that of dividend decrease group, the corresponding difference in means is not significant (t-stat = -1.23). Accordingly, dividend constant group are associates with greater values of *SIZE*, *PROFIT*, *MTBV*, *GOA*, *RETE* and *CTAT* than dividend decrease group across sample countries apart from the US where dividend-decreasing companies have relatively higher market to book ratio (*MTBV*). The most interesting finding in this section is that higher *MTBV* and higher *CTAT* are associated with greater incidence of increasing dividends among the dividend payers, in contrast with the results presented in previous section showing that both measures are associated with lower probability of paying dividends.

In contrast, the results show that the effects of some firm characteristics, such as firm age (*AGE*), *LEVERAGE* and R&D expenditures (*R&D*), on dividend changes are not constant for different countries. For example, in the US and Japan, the average *LEVERAGE* of dividend-increasing companies is significantly lower than that of dividend-decreasing companies. However, such relation is not applicable for companies in the remaining sample countries. Besides, the US dividend-increasing group has greater value-weighted dividend premium (*EDP*) than dividend-decreasing group. However, this is the only evidence supporting dividend catering theory resulted from this section.

Table 5-11-A also presents the results regarding the frequency distribution of some binomial variables and the findings are as following Firstly, dividends increase events are more likely to happen to high technology firms in comparison to the events of dividends decrease or dividends constant, for all sample countries apart from Canada. For example, for the US, 28.66% of dividend-increasing observations are related to high technology firms. However, in contrast, a lower fraction of dividend-decreasing observations (19.68%) and constant dividends observations (26.49%) are observed to be related high technology firms. One possible explanation is that technology-oriented firms usually face rapid shifts in their financial conditions and need to transition from low dividends to high dividends more frequently, consistent with the implication of lifecycle hypothesis.

Secondly, dividend-increasing firms have lower chance to be delisted in the US, Canada, Germany and France. However, a contrary relation is found for firms in the UK, Japan and Hong Kong. For example, in the UK, the delisting rate is 7.86% for dividend-increasing firms versus 7.59% for dividend-decreasing firms. Thirdly, the evidence on the relation between dividend changes and M&A factors is mixed among sample countries. For the US and UK, the companies in dividend increase group has higher proportion of becoming acquirers (*ACQUIRER*) than those in comparative groups. Consistently, for both countries, the frequency of a measure to indicate a firms will merger or takeover other targets within 3 years (*TIN3*) is higher for firms in dividend increase group than those in control groups. However, the relevant findings are not clear-cut for other sample countries. For example, the percentage of Japanese dividend-increasing firms that become acquirers is 1.72%, whilst the percentage of Japanese dividend-decreasing firms that become acquirers is higher at 2.14%.

Finally, for the US and Canada, a lower percent of dividend-increasing firms became target firms (*TARGET*) or were taken over within following 3 years (*TAKENIN3*)

Table 5-11-A Firm Characteristics for Groups of Dividends Increase, Decrease and Constant

This table reports the firm characteristics for groups of dividends increase, decrease and constant over the period 1989-2010 for each sample countries. Follow Benartzi, Michaely and Thaler (1997) and Guay and Harford (2000), a dividend increase is defined as an event in which dividend per share increases from year t-1 to year t for a firm i. A dividend decrease is defined as an event in which dividend per share decreases from year t-1 to year t for a firm i. If there is no change in dividend per share from year t-1 to year t for a firm i, it is defined as an event of dividend constant. "N" is meant to the total number of firm-year observations. T-statistics of the difference in means between dividend increase group and dividend decrease group are displayed in the last row. The numbers reported under "Frequency Distribution of Firm Characteristics (%)" represent the proportions of the firm-year observations that are associated with a certain characteristics. For example, in the US, 28.66% of dividends increase observations are of high technology firms. These variables are defined in **Table 5-2**. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

			US				
Variable	Increase (N=8793)		Decrease (N=630)		Constant (N=7470)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.7200	0.7927	0.5493	0.5718	0.6310	0.6773	14.75***
PROFIT	0.1347	0.0806	0.1528	0.0517	0.1236	0.0553	-1.23
MTBV	1.9932	1.6358	1.6798	1.2668	1.5997	1.3380	6.17***
GOA	0.1140	0.0749	0.0449	0.0174	0.0860	0.0455	7.87***
RETE	0.7840	0.7719	0.4712	0.4350	0.6338	0.6448	9.85***
AGE	20.36	21.00	17.76	19.00	19.87	20.00	6.83***
LEVERAGE	0.1791	0.1633	0.1973	0.1806	0.1956	0.1868	-2.61***
CTAT	0.0363	0.0005	0.0271	0.0000	0.0321	0.0000	3.77***
R&D	0.0161	0.0000	0.0109	0.0000	0.0160	0.0000	4.91***
VDP	0.0335	0.0240	0.0471	0.0350	0.0412	0.0350	-5.30***
EDP	-0.1460	-0.1533	-0.1604	-0.1602	-0.1613	-0.1636	2.95***
			Frequency Distribution of Firm Characteristics (%)				
HITECH	28.66		19.68		26.49		
ACQUIRER	19.33		10.00		17.36		
TARGET	15.96		21.43		20.25		
TIN3	2.92		1.27		2.82		
TAKENIN3	3.76		4.29		5.44		
DLIN3	1.66		2.22		1.93		
			Canada				
Variable	Increase (N=1204)		Decrease (N=232)		Constant (N=1256)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.7319	0.7946	0.6465	0.6967	0.6856	0.7509	4.68***
PROFIT	0.1113	0.1021	0.0762	0.0803	0.0846	0.0806	3.86***
MTBV	1.5136	1.3039	1.2416	1.1150	1.3022	1.1456	6.74***
GOA	0.1863	0.0866	0.0789	0.0219	0.1132	0.0480	3.90***
RETE	0.3161	0.3401	-0.0718	0.0289	0.2518	0.3080	8.56***
AGE	15.05	14.00	12.65	11.00	16.25	17.00	4.00***
LEVERAGE	0.1947	0.1774	0.2063	0.1997	0.1980	0.1844	-0.89
CTAT	0.0224	0.0000	0.0120	0.0000	0.0195	0.0000	3.53***
R&D	0.0044	0.0000	0.0031	0.0000	0.0041	0.0000	1.21
VDP	-0.0418	-0.0407	-0.0281	-0.0349	-0.0282	-0.0386	-1.96**
EDP	-0.3343	-0.3271	-0.3103	-0.3063	-0.3010	-0.2872	-2.20***
			Frequency Distribution of Firm Characteristics (%)				
HITECH	13.54		15.52		15.84		
ACQUIRER	4.65		6.03		5.73		
TARGET	10.63		11.64		12.10		
TIN3	0.25		0.43		1.19		
TAKENIN3	2.24		5.17		3.34		
DLIN3	3.49		6.03		3.26		
			UK				
Variable	Increase (N=10664)		Decrease (N=1212)		Constant (N=1839)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.6374	0.6820	0.5003	0.4669	0.5178	0.5216	15.46***
PROFIT	0.0809	0.0767	0.0339	0.0417	0.0485	0.0538	15.48***
MTBV	1.6648	1.4079	1.2778	1.0886	1.3214	1.1822	16.75***

GOA	0.1741	0.0972	0.0414	0.0007	0.0704	0.0274	15.04***
RETE	0.5165	0.4955	0.3794	0.3550	0.3902	0.4046	7.12***
AGE	19.15	18.00	20.46	22.00	20.38	22.00	-3.64***
LEVERAGE	0.1221	0.0844	0.1166	0.0792	0.1081	0.0745	1.41
CTAT	0.0853	0.0464	0.0763	0.0411	0.0785	0.0424	3.02***
R&D	0.0089	0.0000	0.0081	0.0000	0.0092	0.0000	1.12
VDP	0.0717	0.0720	0.0802	0.0744	0.0800	0.1036	-2.68***
EDP	-0.2774	-0.2828	-0.2580	-0.2110	-0.2399	-0.2067	-3.61***
Frequency Distribution of Firm Characteristics (%)							
HITECH	20.46		18.65		20.50		
ACQUIRER	7.77		7.18		7.67		
TARGET	7.93		7.76		6.42		
TIN3	1.01		0.33		0.71		
TAKENIN3	1.27		1.07		1.58		
DLIN3	7.86		7.59		7.07		
Germany							
Variable	Increase (N=1879)		Decrease (N=384)		Constant (N=1268)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.6830	0.7348	0.5647	0.5820	0.6145	0.6733	7.74***
PROFIT	0.0549	0.0463	0.0416	0.0322	0.0452	0.0391	3.31***
MTBV	1.5819	1.2763	1.4683	1.1886	1.5195	1.2450	2.01**
GOA	0.1252	0.0666	0.0542	0.0252	0.0862	0.0401	5.68***
RETE	0.4022	0.4172	0.2550	0.2689	0.3628	0.3804	4.88***
AGE	14.49	12.00	13.49	11.00	14.72	12.00	2.12**
LEVERAGE	0.1168	0.0746	0.1027	0.0653	0.1089	0.0605	2.01**
CTAT	0.0718	0.0440	0.0606	0.0345	0.0602	0.0334	2.45**
R&D	0.0165	0.0000	0.0159	0.0000	0.0112	0.0000	0.29
VDP	-0.0652	-0.0616	-0.0516	-0.0383	-0.0495	-0.0383	-2.52**
EDP	-0.0912	-0.0680	-0.0525	0.0247	-0.0656	-0.0408	-3.64***
Frequency Distribution of Firm Characteristics (%)							
HITECH	33.58		24.22		26.74		
ACQUIRER	0.64		0.52		1.03		
TARGET	0.85		0.00		0.87		
TIN3	0.00		0.00		0.00		
TAKENIN3	0.05		0.00		0.24		
DLIN3	3.30		3.91		4.65		
France							
Variable	Increase (N=2916)		Decrease (N=704)		Constant (N=1106)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.6393	0.6992	0.5892	0.6233	0.5047	0.5102	4.46***
PROFIT	0.0620	0.0544	0.0491	0.0403	0.0539	0.0461	6.10***
MTBV	1.5346	1.2560	1.3529	1.1100	1.3677	1.1096	5.35***
GOA	0.1251	0.0689	0.0838	0.0377	0.0909	0.0445	4.12***
RETE	0.5527	0.5658	0.4598	0.4692	0.4934	0.5168	6.10***
AGE	12.51	10.00	12.33	10.00	10.94	9.00	0.55
LEVERAGE	0.1302	0.1037	0.1396	0.1056	0.1232	0.0854	-1.75
CTAT	0.0551	0.0394	0.0493	0.0341	0.0532	0.0337	2.50**
R&D	0.0080	0.0000	0.0061	0.0000	0.0066	0.0000	2.15**
VDP	0.0358	0.0434	0.0184	-0.0314	0.0308	0.0302	3.76***
EDP	-0.0697	-0.0641	-0.0542	-0.0616	-0.0423	-0.0194	-3.39***
Frequency Distribution of Firm Characteristics (%)							
HITECH	27.37		21.59		27.40		
ACQUIRER	1.51		0.99		0.81		
TARGET	1.44		0.14		0.99		
TIN3	0.14		0.00		0.09		
TAKENIN3	0.31		0.00		0.18		
DLIN3	6.69		8.24		7.05		
Japan							
Variable	Increase (N=10522)		Decrease (N=3228)		Constant (N=14492)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	

SIZE	0.5948	0.6261	0.5444	0.5549	0.5311	0.5328	9.27***
PROFIT	0.0350	0.0310	0.0112	0.0117	0.0140	0.0136	29.79***
MTBV	1.4515	1.2589	1.2151	1.0887	1.1793	1.0830	19.95***
GOA	0.0707	0.0492	0.0253	0.0109	0.0293	0.0165	18.41***
RETE	0.3489	0.3522	0.3007	0.3070	0.2993	0.3031	9.23***
AGE	16.04	15.00	16.68	17.00	17.58	17.00	-3.49***
LEVERAGE	0.1000	0.0705	0.1181	0.0987	0.1155	0.0921	-8.31***
CTAT	0.1198	0.0988	0.1088	0.0895	0.0994	0.0812	5.67***
R&D	0.0125	0.0022	0.0108	0.0017	0.0103	0.0011	4.50***
VDP	0.0531	0.0530	0.0800	0.0695	0.0745	0.0695	-13.33***
EDP	-0.1128	-0.0754	-0.0511	-0.0231	-0.0693	-0.0231	-26.46***
Frequency Distribution of Firm Characteristics (%)							
HITECH	37.37		34.20		33.19		
ACQUIRER	1.72		2.14		1.75		
TARGET	0.95		0.96		1.05		
TIN3	0.13		0.28		0.39		
TAKENIN3	0.09		0.12		0.17		
DLIN3	1.33		0.99		1.21		

Hong Kong

Variable	Increase (N=2005)		Decrease (N=796)		Constant (N=1046)		t-statistics of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.6876	0.7474	0.5810	0.5971	0.6011	0.6183	10.03***
PROFIT	0.0963	0.0842	0.0600	0.0482	0.0757	0.0648	12.50***
MTBV	1.3457	1.0512	0.9634	0.8224	1.0954	0.9134	13.65***
GOA	0.1824	0.1264	0.1046	0.0509	0.1394	0.0822	6.34***
RETE	0.3694	0.3757	0.3447	0.3387	0.3264	0.3412	1.78
AGE	12.40	11	12.58	11.00	13.11	11.00	-0.54
LEVERAGE	0.0812	0.0423	0.0853	0.0464	0.0751	0.0330	-0.98
CTAT	0.1261	0.0904	0.1084	0.0781	0.1149	0.0833	3.64***
R&D	0.0023	0.0000	0.0015	0.0000	0.0018	0.0000	2.67***
VDP	-0.0749	-0.0769	-0.0879	-0.0769	-0.0705	-0.0698	1.71*
EDP	-0.1717	-0.2118	-0.1516	-0.1916	-0.1803	-0.2156	-3.16***
Frequency Distribution of Firm Characteristics (%)							
HITECH	12.67		9.42		11.09		
ACQUIRER	0.00		0.00		0.00		
TARGET	0.00		0.00		0.00		
TIN3	0.00		0.00		0.00		
TAKENIN3	0.00		0.00		0.00		
DLIN3	1.70		1.26		0.86		

comparing with firms in control groups. It might be explained that firms increase dividends merely when they are financially healthy and thus the resistance of being taken over is great. However, this finding is not consistent in other countries.

Table 5-11-B summarizes the results from the comparisons among three control groups: start paying, stop paying and continue to pay. According to Deshmukh (2003), “start paying” represents a change from a dividend of zero in year t-1 to some positive amount in year t for firm i. Similarly, “stop paying” represents a change from some positive amount in year t to a dividend of zero in year t+1 to for firm i and ‘continue to pay’ refers to a firm i continues to pay dividends in two consecutive year t-1 and year t. Again, the values of t-statistics of the difference in means between start paying group and stop paying group are displayed in the last row. The results can be generalized as below.

Firstly, the finding about the difference between control groups in relation to some company characteristics appears to be in line with the maturity explanation. It is shown that start-paying firms are generally younger than both stop-paying firms and continue to pay firms. For example, for the US, the average firm age is 11 for "start paying" group versus 20.27 for "stop paying" group. Correspondingly, more observed firm characteristics are closely related with the maturity of firms. Specifically, the results show that firms in start-paying group are of smaller size (*SIZE*), higher growth rate (*MTBV* and *GOA*) and lower ratio of retained earnings to total equity (*RETE*) than stop-paying group.

Secondly, the leverage level of stop-paying companies is on average higher than that of start-paying companies. One possible reason is stop-paying companies are relatively older than start-paying companies since Eije and Megginson (2008) hypothesized that older companies might be associated with higher leverage. The other explanation can be that debts and dividends are substitutes for providing monitoring as suggested by Jensen (1986) and thus firms with higher leverage tend to stop paying dividends.

Thirdly, the rest of firm characteristics including profitability (*PROFIT*), cash holdings (*CTAT*), R&D expenditures (*R&D*) are proven country-specific among control groups. For example, for the UK, start-paying firms have higher cash holdings (*CTAT*) and lower R&D expenditures comparing with remaining firms. However, such relations do not hold for the US and Canada.

Fourthly, the evidence is partly consistent with dividend catering hypothesis. For the US, Canada, the value-weighted dividend premium (*VDP*) of start-paying firms is significantly greater than that of stop-paying firms. For the UK and Hong Kong, the equally weighted dividend premium (*EDP*) of start-paying firms is significantly greater than that of stop-paying firms.

Moreover, the results on the frequency distribution of firm characteristics for control groups are presented in **Table 5-11-B**. Firstly "start-paying" group is more likely to be associated with technology factor than "stop-paying" group and "continue to pay" group, for all sample countries with the exception of Japan. Secondly, a distinctive finding is that start-paying companies have lower delisting rate (*DLIN3*). This may indicate that companies confronting delisting risk have lower chance to start paying dividend, and instead they have higher chance to terminate paying. Thirdly, again, the

Table 5-11-B Firm Characteristics for Groups of Start Paying, Stop Paying and Continue to Pay

This table reports the firm characteristics for groups of start paying, stop paying, and continue to pay covering the period 1989-2010 for each sample countries. According to Deshmukh (2003), 'start paying' represents a change from a dividend of zero in year t-1 to some positive amount in year t for firm i. Similarly, 'stop paying' represents a change from some positive amount in year t to a dividend of zero in year t+1 to for firm i and 'continue to pay' refers to a firm i continues to pay dividends in two consecutive year t-1 and year t. "N" is meant to the total number of firm-year observations. T-statistics of the difference in means between dividend increase group and dividend decrease group are displayed in the last row. The numbers reported under "Frequency Distribution of Firm Characteristics (%)" represent the proportions of the firm-year observations that are associated with a certain characteristics. These variables are defined in Section 5.2.2. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

US							
Variable	Start Paying (N=1773)		Stop Paying (N=2220)		Continue toPay (N=17142)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.5241	0.5351	0.6008	0.6412	0.6732	0.7355	-8.69***
PROFIT	0.1174	0.0647	0.0888	0.0491	0.1300	0.0687	2.58***
MTBV	1.8018	1.4308	1.6304	1.3317	1.8047	1.4749	4.90***
GOA	0.1549	0.0827	0.0695	0.0365	0.1007	0.0607	8.70***
RETE	0.3100	0.3053	0.5963	0.6468	0.6991	0.7042	-11.79***
AGE	11.00	9.00	20.27	19.00	19.79	20.00	-28.22***
LEVERAGE	0.1897	0.1506	0.2169	0.2006	0.1879	0.1744	-4.76***
CTAT	0.0493	0.0000	0.0457	0.0017	0.0339	0.0000	1.25
R&D	0.0151	0.0000	0.0152	0.0000	0.0157	0.0000	-0.08
VDP	0.0299	0.0179	0.0120	-0.0168	0.0374	0.0312	9.60***
EDP	-0.1437	-0.1602	-0.1204	-0.1274	-0.1535	-0.1602	-6.48***
Frequency Distribution of Firm Characteristics (%)							
HITECH	28.71		26.85		27.27		
ACQUIRER	9.14		12.07		17.93		
TARGET	18.61		25.54		18.11		
TIN3	1.69		0.77		2.79		
TAKENIN3	5.44		4.29		3.76		
DLIN3	5.08		9.23		1.81		
Canada							
Variable	Start Paying (N=505)		Stop Paying (N=523)		Continue to Pay (N=2790)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.4366	0.4473	0.6379	0.6844	0.6999	0.7646	-10.67***
PROFIT	0.0856	0.0836	0.0475	0.0633	0.0946	0.0887	4.57***
MTBV	1.4038	1.1605	1.3172	1.1397	1.3892	1.2073	1.86*
GOA	0.1881	0.0061	0.0715	0.0341	0.1415	0.0620	4.12***
RETE	0.0995	0.0866	0.0665	0.1675	0.2425	0.2837	0.86
AGE	8.88	7.00	14.93	14.00	14.97	15.00	-11.37***
LEVERAGE	0.1656	0.1357	0.2062	0.2038	0.1958	0.1802	-3.92***
CTAT	0.0303	0.0000	0.0300	0.0000	0.0197	0.0000	0.08
R&D	0.0060	0.0000	0.0054	0.0000	0.0040	0.0000	0.39
VDP	-0.0589	-0.0567	-0.1208	-0.1405	-0.0357	-0.0386	7.59***
EDP	-0.3529	-0.3598	-0.3321	-0.3592	-0.3207	-0.3254	-2.43**
Frequency Distribution of Firm Characteristics (%)							
HITECH	16.83		16.63		14.7		
ACQUIRER	3.76		3.82		5.2		
TARGET	10.10		15.30		11.33		
TIN3	0.99		0.57		0.72		
TAKENIN3	3.34		5.17		2.24		
DLIN3	7.72		15.87		3.94		
UK							
Variable	Start Paying (N=1741)		Stop Paying (N=2170)		Continue (N=13857)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.4732	0.4543	0.5121	0.5151	0.6088	0.6501	-4.56***
PROFIT	0.0745	0.0709	0.0129	0.0416	0.0727	0.0709	14.84***
MTBV	1.8651	1.4908	1.3767	1.1458	1.5906	1.3408	13.70***
GOA	0.2931	0.0893	0.0672	0.0255	0.1502	0.0782	14.29***
RETE	0.0711	0.1432	0.2811	0.3040	0.4859	0.4665	-9.24***

AGE	9.09	3.00	18.06	14.00	19.26	19.00	-23.76***
LEVERAGE	0.1112	0.0550	0.1354	0.0902	0.1197	0.0823	-5.20***
CTAT	0.1065	0.0480	0.0795	0.0385	0.0836	0.0454	6.48***
R&D	0.0076	0.0000	0.0091	0.0000	0.0089	0.0000	-1.81*
VDP	0.0590	0.0517	0.0944	0.1036	0.0735	0.0720	-10.37***
EDP	-0.2807	-0.2866	-0.2892	-0.2828	-0.2705	-0.2828	1.83*
Frequency Distribution of Firm Characteristics (%)							
HITECH	22.00		20.88		20.34		
ACQUIRER	5.05		6.87		7.7		
TARGET	6.09		7.10		7.73		
TIN3	0.86		0.37		0.91		
TAKENIN3	1.58		1.07		1.27		
DLIN3	13.33		35.16		7.72		
Germany							
Variable	Start Paying (N=978)		Stop Paying (N=789)		Continue to Pay (N=3531)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.5032	0.5162	0.5673	0.5974	0.6455	0.6964	-5.02***
PROFIT	0.0345	0.0366	0.0000	0.0115	0.0500	0.0423	6.34***
MTBV	1.6637	1.3086	1.5077	1.2357	1.5471	1.2594	3.13***
GOA	0.1282	0.0455	0.0407	0.0148	0.1034	0.0505	6.14***
RETE	0.0750	0.1432	0.1911	0.2467	0.3720	0.3886	-3.50***
AGE	9.25	7.00	14.66	13.00	14.47	12.00	-13.15***
LEVERAGE	0.1041	0.0592	0.1209	0.0753	0.1124	0.0679	-2.63***
CTAT	0.0679	0.0311	0.0666	0.0324	0.0664	0.0389	0.30
R&D	0.0118	0.0000	0.0141	0.0000	0.0145	0.0000	-1.47
VDP	-0.0392	-0.0221	-0.0350	-0.0221	-0.0581	-0.0427	-0.74
EDP	-0.0682	-0.0259	-0.0554	0.0247	-0.0778	-0.0408	-1.47
Frequency Distribution of Firm Characteristics (%)							
HITECH	32.72		30.29		30.1		
ACQUIRER	0.61		0.63		0.76		
TARGET	0.82		1.01		0.76		
TIN3	0.10		0.00		0.		
TAKENIN3	0.31		0.51		0.11		
DLIN3	3.68		14.45		3.85		
France							
Variable	Start Paying (N=775)		Stop Paying (N=699)		Continue to Pay (N=4940)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.4205	0.3978	0.5281	0.5375	0.5836	0.6314	-7.34***
PROFIT	0.0558	0.0497	0.0142	0.0194	0.0586	0.0507	10.14***
MTBV	1.7107	1.3540	1.3097	1.1132	1.4701	1.1988	8.62***
GOA	0.1978	0.0906	0.0691	0.0322	0.1146	0.0617	7.24***
RETE	0.2996	0.3153	0.3928	0.4293	0.5163	0.5279	-3.41***
AGE	6.03	3.00	11.91	10.00	11.66	9.00	-15.22v
LEVERAGE	0.1206	0.0829	0.1391	0.1118	0.1294	0.0998	-2.84***
CTAT	0.0404	0.0222	0.0501	0.0322	0.0538	0.0374	-3.18***
R&D	0.0073	0.0000	0.0085	0.0000	0.0072	0.0000	-0.87
VDP	0.0473	0.0828	0.1095	0.1514	0.0308	0.0171	-8.42***
EDP	-0.0870	-0.0804	-0.0419	0.0010	-0.0591	-0.0616	-8.17***
Frequency Distribution of Firm Characteristics (%)							
HITECH	34.84		32.33		26.54		34.84
ACQUIRER	1.42		1.29		1.23		1.42
TARGET	1.68		1.14		1.09		1.68
TIN3	0.13		0.14		0.1		0.13
TAKENIN3	0.18		0.00		0.31		0.18
DLIN3	7.87		10.87		6.74		7.87
Japan							
Variable	Start Paying (N=2662)		Stop Paying (N=3117)		Continue to Pay (N=28583)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.3849	0.3330	0.5083	0.5109	0.5544	0.5690	-16.94***
PROFIT	0.0314	0.0270	0.0072	0.0078	0.0217	0.0190	19.23***
MTBV	1.6151	1.3524	1.0657	0.9801	1.2898	1.1409	29.40***

GOA	0.0879	0.0063	0.0158	0.0050	0.0452	0.0270	15.69***
RETE	0.0759	0.1005	0.2844	0.3335	0.3166	0.3194	-21.07***
AGE	9.95	4.00	20.30	20.00	16.73	16.00	-37.40***
LEVERAGE	0.1137	0.0839	0.1145	0.0847	0.1100	0.0845	-0.27
CTAT	0.1048	0.0779	0.0959	0.0726	0.1083	0.0879	3.18***
R&D	0.0075	0.0000	0.0127	0.0030	0.0111	0.0014	-11.04***
VDP	0.0448	0.0351	0.0568	0.0256	0.0667	0.0695	-4.82***
EDP	-0.0949	-0.0754	-0.0711	-0.0864	-0.0835	-0.0233	-8.69***
Frequency Distribution of Firm Characteristics (%)							
HITECH	32.83		33.21		34.88		
ACQUIRER	1.28		1.64		1.77		
TARGET	1.24		1.32		1		
TIN3	0.23		0.06		0.28		
TAKENIN3	0.17		0.12		0.09		
DLIN3	2.03		10.14		1.22		

Hong Kong

Variable	Start Paying (N=1172)		Stop Paying (N=893)		Continue to Pay (N=3910)		t-stat of difference
	Mean	Median	Mean	Median	Mean	Median	
SIZE	0.4677	0.4781	0.5587	0.5668	0.6410	0.6784	-7.40***
PROFIT	0.0826	0.0738	0.0487	0.0548	0.0839	0.0709	6.59***
MTBV	1.3316	1.0675	1.2302	0.9598	1.2074	0.9560	2.67***
GOA	0.2360	0.0817	0.1742	0.1265	0.1562	0.0999	3.23***
RETE	0.1634	0.1929	0.3063	0.3520	0.3531	0.3581	-7.50***
AGE	6.82	4.00	11.89	10.00	12.46	11.00	-14.99***
LEVERAGE	0.0690	0.0194	0.0796	0.0379	0.0799	0.0386	-2.40**
CTAT	0.1499	0.1079	0.1352	0.0998	0.1201	0.0864	2.32**
R&D	0.0029	0.0000	0.0028	0.0000	0.0020	0.0000	0.02
VDP	-0.0700	-0.0698	-0.0389	0.0670	-0.0761	-0.0769	-4.17***
EDP	-0.1571	-0.2118	-0.1769	-0.1578	-0.1703	-0.2118	3.37***
Frequency Distribution of Firm Characteristics (%)							
HITECH	19.03		17.81		11.56		
ACQUIRER	0.00		0.00		0		
TARGET	0.00		0.00		0		
TIN3	0.00		0.00		0		
TAKENIN3	0.00		0.00		0		
DLIN3	1.62		4.82		1.36		

effects of the M&A factors (*ACQUIRER, TIN3, TARGET,* and *TAKENIN3*) on investigated dividend behaviors in this section are heterogeneous among sample countries. For most sample countries including US, Canada, UK, Germany, and Japan, start-paying companies are less likely to be acquirers (*ACQUIERER*) than other companies. For US, Canada and UK, start-paying companies are less likely to be targets of M&A (*TARGET*).

5.7 Relationship between Dividend s and Earnings & Adjustment Speed of Dividends

Choe (1990) and Brav, Graham, Harvey, and Michaely (2005) find that the linkage between cash dividends and earnings has weakened. Consistently, Skinner (2008) use Lintner (1956) model to investigate a sample of 351 firms listed on CompuStat from 1980- 2005 and finds that the both the coefficients of earnings and lagged dividends become less significant. Skinner (2008) argues that this is owing to share repurchases are increasingly used in place of dividends. This argument is consistent with Grullon and Michaely (2002) who argue that share repurchases substitute for dividends as the method of distributing earnings. In an empirical investigation basing on a sample of 291 listed European companies from 1989-2005, Eije and Megginson (2008) find that dividends are still more responsive to earnings comparing with repurchases. In addition, Eije and Megginson (2008) show that both the impact of earnings on cash dividends paid and the speed of adjustment of dividends decline slightly.

This section focuses on the evolution of the sensitivity of dividends to earnings and the speed of adjustment of dividends and extends the investigation to multinational markets for full period 1989-2010, and for two sub-periods 1989-2000, and 2001-2010. Different from the tests of Skinner (2008), and Eije and Megginson (2008) which are based on small samples, the test in this section utilises a large pooled sample comprising all firm-year observations in case the consecutive data on dividend per share (DPS) and earnings per share (EPS) is available. The tests follow the following Lintner model regressions:

$$\Delta DPS_{it} = DPS_{it} - DPS_{i,t-1} = \alpha + \delta EPS_{it} - \gamma DPS_{i,t-1} + \varepsilon_{i,t} \qquad (5-2)$$

Rearranging Equation (5-2) gives the following estimated dividend equation:

$$DPS_{it} = \alpha + \beta_1 EPS_{it} + \beta_2 DPS_{i,t-1} + \varepsilon_{i,t} \qquad (5-3)$$

DPS_{it} is the current dividend per share, EPS_i the current earnings per share, $\mathrm{DPS}_{i,t-1}$ the previous dividend per share, $\beta_1 = \delta$ is the target payout ratio indicating the sensitivity to earnings, $\gamma = 1 - \beta_2$ is the speed of adjustment, and $\varepsilon_{i,t}$ is the error term. Random-effects generalized least- squares (GLS) estimation with AR (1) disturbance with standard errors clustered at the firm level is applied.

The results in **Table 5-12** show that in all regressions in different sample periods, the coefficients of earnings and lagged dividends are strongly significant with an exception in Hong Kong (*p*-value of DPS_{t-1} is 0.12 for sub-period 1989-2000). Moreover, for each sample country, the earnings coefficients are statistically significant. The earnings coefficients are uniformly smaller over sub-period 2001-2010 comparing with the results over sub-period 1989-2000, in line with the results reported by Eije and Megginson (2008). For example, for the UK, the coefficient of EPS_t is 0.0213 in 2001-2010 versus 0.0912 in 1989-2000. Moreover, the speed of adjustment increases in the US from 0.06 in 1989-2000 to 0.66 in 2001-2010 but declines in the remaining countries. This finding is consistent with Skinner (2008) who finds that the speed of adjustment increases in the US from 0.18 in 1980-2000 to 0.29 in 1995-2005. In contrast, using EU-based data, Eije and Megginson (2008) find that the speed of adjustment decreases from 0.547 in 1996-2000 to 0.392 in 2001-2005. Overall, the results show that dividends still response to earnings but the sensitivity weakens, in line with with Brav et al. (2005), and Eije and Megginson (2008). Apart from in the US, the speed of dividend adjustments decreases in the remaining sample countries.

Table 5-12 Tests Using Lintner Model

This table reports results using Linter (1956) model for a full sample period of between 1989 and 2010, and for two sub-periods between 1989 and 2000, and 2001 and 2010. The random-effects GLS estimation with AR (1) disturbance is applied. The dependent variable is current dividend payments (DPS_t), whilst independent variables are current earnings (EPS_t) and the lagged dividend payments (DPS_{t-1}). SOA refers to the speed of adjustment of dividends. *p*-values are reported in parentheses. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

	1989-2000	2001-2010	1989-2010
	US		
C	0.0117***	0.4112***	0.3018***
	(0.00)	(0.00)	(0.00)
EPS_t	0.0315***	0.011***	0.0109***
	(0.00)	(0.00)	(0.00)
DPS_{t-1}	0.9361***	0.3355***	0.4506***
	(0.00)	(0.00)	(0.00)
SOA	0.06	0.66	0.55
N	8918	8030	18563
R-sq:	88.39%	53.06%	62.79%
	UK		
C	1.1501***	1.5271***	0.4144***
	(0.00)	(0.00)	(0.00)
EPS_t	0.0912***	0.0213***	0.0791***
	(0.00)	(0.00)	(0.00)
DPS_{t-1}	0.6571***	0.8205***	0.7933***
	(0.00)	(0.00)	(0.00)
SOA	0.34	0.18	0.21
N	5956	4082	11150
R-sq:	87.01%	78.03%	89.10%
	France		
C	0.2639**	0.2757	0.2614
	(0.02)	(0.44)	(0.13)
EPS_t	0.0623***	0.185***	0.0972***
	(0.00)	(0.00)	(0.00)
DPS_{t-1}	0.7888***	0.6694***	0.7748***
	(0.00)	(0.00)	(0.00)
SOA	0.21	0.33	0.23
N	1555	1656	3358
R-sq:	76.51%	70.15%	94.63%
	Hong Kong		
C	0.1906***	0.0117***	0.0973***
	(0.00)	(0.00)	(0.00)
EPS_t	0.1956***	0.0265***	0.1099***
	(0.00)	(0.00)	(0.00)
DPS_{t-1}	-0.0354	0.909***	0.1651***
	(0.12)	(0.00)	(0.00)
SOA	1.04	0.09	0.83
N	1042	2288	3412
R-sq:	99.12%	93.08%	99.53%

	1989-2000	2001-2010	1989-2010
	Canada		
C	-0.0377***	0.0345***	0.0364***
	(0.00)	(0.01)	(0.00)
EPS_t	0.1112***	0.0322***	0.0602***
	(0.00)	(0.00)	(0.00)
DPS_{t-1}	0.8468***	0.9236***	0.8592***
	(0.00)	(0.00)	(0.00)
SOA	0.15	0.08	0.14
N	705	1148	1998
R-sq:	91.28%	87.76%	87.18%
	Germany		
C	1.0563***	0.8557***	0.349***
	(0.00)	(0.00)	(0.00)
EPS_t	0.0323***	0.0092***	0.0133***
	(0.00)	(0.01)	(0.00)
DPS_{t-1}	0.3494***	0.5915***	0.8338***
	(0.00)	(0.00)	(0.00)
SOA	0.65	0.41	0.17
N	1085	1242	2475
R-sq:	65.23%	54.41%	87.04%
	Japan		
C	-0.0389	7.1878***	5.731***
	(0.82)	(0.00)	(0.00)
EPS_t	0.056***	0.0446***	0.0457***
	(0.00)	(0.00)	(0.00)
DPS_{t-1}	0.8244***	0.8631***	0.8536***
	(0.00)	(0.00)	(0.00)
SOA	0.18	0.14	0.15
N	11422	12964	25844
R-sq:	97.06%	94.62%	98.18%

5.8 Changes in Payout Methods

In this section, I trace the changes in payout methods using the transition matrix, which a method proposed by Grullon and Michealy (2002) and used by Lee and Suh (2011) recently. All firm-year observations are categorised into four groups: (I) No dividends and no repurchases; (II) Only dividends; (III) Only repurchases, and; (IV) Both dividends and repurchases. A transition refers to a change in payout method between two consecutive years made by a company in my sample. Due to the data availability, the sample period is 1989 to 2010 for the US and 1999 to 2010 for the remaining sample countries.

The findings are shown in **Table 5-13.** Firstly, in accordance with the results presented by Grullon and Michealy (2002) and Lee and Suh (2011), companies in all the sample countries did not change payout methods frequently from year to year if they neither paid dividends nor repurchased shares (DIV=0, REP=0), or only paid dividend (DIV>0, REP=0). In each sampled country, the percentage of companies that did not pay dividends or repurchased (DIV=0, REP=0) in last year T-1 and continued to do so in T is high at above 80% (e.g. 90.3% in the UK and 81.35% in Japan). Similarly, firms that only paid dividends (DIV>0, REP=0) in T-1 have the great chance to persist in the same decision in T (e.g. 85.19% in the UK and 91.2% in Japan). Accordingly, the likelihood that dividend-paying firms (DIV>0, REP=0; DIV>0, REP>0) in T-1 converting to non dividend-paying firms (DIV=0, REP=0; DIV=0, REP>0) in T is very low. These findings are consistent with the implication of Linter (1956) that companies should be very conservative to initiate dividend payout, but once they begin, they tend to continue. The other implication is that dividend payment is a stable and long-term strategy for companies.

By contrast, repurchasing shares is not a regular means of distributing cash flows relative to cash dividends, as the percentage of firms that only repurchased shares (DIV=0, REP>0) in T-1 continued to do so in T is relatively low in most sample countries (e.g. 90.3% in the UK and 81.35% in Japan). The corresponding percentage is higher in the US (40.75%) and Canada (29.56%). It is rare for firms that only paid out dividends (DIV>0, REP=0) switch to firms that only repurchased shares (DIV=0, REP>0). The corresponding percentage following this transition pattern is 0.75 in the US (1989-2010), 0.97 in Canada, 0.22 in the UK, 0.22 in Germany, 0.23 in France, 0.18 in Japan and 0.92 in Hong Kong. In contrast, firms that only repurchased shares (DIV=0, REP>0) are more likely to switch directly to firms that only paid dividends (DIV>0, REP=0). The corresponding percentage following this transition pattern is 2.35% in the US (1989-2010), 2.77% in Canada, 7.65% in the UK, 9.76% in Germany, 13.33% in France, 22.68% in Japan, and 12.5% in Hong Kong. These results are in line with Guay and Harford (2000) who document that dividend increases relate to relatively permanent cash flow shocks and repurchases relate to transient shocks.

The results also show that a considerable percentage of companies switched from using single payout method (i.e. only dividends, or only repurchases) to using dual payout methods (i.e. both dividends and repurchases). In the US, Canada, the UK and in Hong Kong, the probability that firms with only dividends (DIV>0, REP=0) transitioned to firms with both dividends and repurchases (DIV>0, REP>0) is 20.41%, 11.86%, 9.64% and 5.7%, respectively. In Japan and Hong Kong the probability that firms with only repurchases (DIV=0, REP>0) transitioned to firms with both dividends and repurchases (DIV>0, REP>0) is 11.34% and 7.81%, respectively. These results imply that dividends and repurchases cannot work as perfect substitutes, and that any single payout channel cannot fulfill all the needs of market participants.

Additionally, the results show that US firms are more likely to distribute their first payouts as repurchases (10.89% over the full period) instead of dividends (1.85% over the full period), and in Canada firms seemed to follow a similar pattern. However, in non-US countries, dividend disbursement is more likely than stock buyback to be used as a method of the first payout. For example, 6.54% of UK companies disgorging earnings initiated payout in the form of dividends whilst only 2.96% initiated using stock repurchasing.

Table 5-13 Transition of Payout Methods

Grullon and Michealy (2002) propose the basic method of transition matrices used here. This analysis looks as the transition of payment channels for companies in the US during the period from 1990-2010, and in the other countries over the period from 1999 to 2010. A transition probability is equal to the number of firms switching to a certain payout policy at time T divided by the total number of firms with a certain payout policy at time T - 1. DIV represents the amount of cash dividend paid and REP represents the amount of repurchased shares.

US 1990-2000					
		T			
		DIV=0, REP=0	DIV>0, REP=0	DIV=0, REP>0	DIV>0, REP>0
		1991-2000			
	DIV=0,REP=0	87.58%	1.62%	10.50%	0.30%
	DIV>0,REP=0	3.16%	76.15%	0.62%	20.07%
	DIV=0,REP>0	58.95%	1.72%	38.09%	1.23%
	DIV>0,REP>0	1.57%	46.84%	1.21%	50.38%
		2001-2010			
	DIV=0,REP=0	86.44%	1.92%	11.08%	0.56%
T-1	DIV>0,REP=0	4.08%	73.95%	0.92%	21.05%
	DIV=0,REP>0	52.83%	2.62%	42.13%	2.41%
	DIV>0,REP>0	2.21%	39.51%	1.75%	56.53%
		1990-2010			
	DIV=0,REP=0	86.81%	1.85%	10.89%	0.46%
	DIV>0,REP=0	3.54%	75.29%	0.75%	20.42%
	DIV=0,REP>0	54.89%	2.35%	40.75%	2.01%
	DIV>0,REP>0	1.97%	43.35%	1.51%	53.17%
Canada 1999-2010					
		T			
		DIV=0, REP=0	DIV>0, REP=0	DIV=0, REP>0	DIV>0, REP>0
	DIV=0,REP=0	90.84%	1.88%	6.90%	0.38%
T-1	DIV>0,REP=0	4.30%	82.88%	0.97%	11.86%
	DIV=0,REP>0	63.97%	2.77%	29.56%	3.70%
	DIV>0,REP>0	2.63%	43.78%	2.15%	51.44%
UK 1999-2010					
		T			
		DIV=0, REP=0	DIV>0, REP=0	DIV=0, REP>0	DIV>0, REP>0
	DIV=0,REP=0	90.30%	6.54%	2.96%	0.19%
T-1	DIV>0,REP=0	4.96%	85.19%	0.22%	9.64%
	DIV=0,REP>0	81.12%	7.65%	9.69%	1.53%
	DIV>0,REP>0	2.62%	55.87%	0.19%	41.32%
Germany 1999-2010					
		T			
		DIV=0, REP=0	DIV>0, REP=0	DIV=0, REP>0	DIV>0, REP>0
	DIV=0,REP=0	88.30%	10.04%	1.36%	0.31%
T-1	DIV>0,REP=0	11.90%	85.87%	0.22%	2.00%
	DIV=0,REP>0	80.49%	9.76%	7.32%	2.44%

	DIV>0,REP>0	6.78%	74.58%	3.39%	15.25%
France 1999-2010					
		T			
		DIV=0, REP=0	DIV>0, REP=0	DIV=0, REP>0	DIV>0, REP>0
T-1	DIV=0,REP=0	87.25%	10.78%	1.70%	0.28%
	DIV>0,REP=0	10.29%	84.86%	0.23%	4.63%
	DIV=0,REP>0	83.33%	13.33%	3.33%	0.00%
	DIV>0,REP>0	1.33%	70.67%	2.00%	26.00%
Japan 1999-2010					
		T			
		DIV=0, REP=0	DIV>0, REP=0	DIV=0, REP>0	DIV>0, REP>0
T-1	DIV=0,REP=0	81.35%	17.20%	1.09%	0.36%
	DIV>0,REP=0	4.46%	91.20%	0.18%	4.16%
	DIV=0,REP>0	49.48%	22.68%	16.49%	11.34%
	DIV>0,REP>0	1.82%	53.04%	0.84%	44.30%
Hong Kong 1999-2010					
		T			
		DIV=0, REP=0	DIV>0, REP=0	DIV=0, REP>0	DIV>0, REP>0
T-1	DIV=0,REP=0	85.72%	10.63%	2.77%	0.87%
	DIV>0,REP=0	12.41%	80.98%	0.92%	5.70%
	DIV=0,REP>0	67.97%	12.50%	11.72%	7.81%
	DIV>0,REP>0	6.17%	54.87%	3.57%	35.39%

5.9 Findings and Conclusions

This chapter examines international trends in dividend payments across seven developed economies from 1989 to 2010, and looks at the extent to which repurchases play a role in dividend policy as well. My results corroborate some findings reported in previous studies. In line with Julio and Ikenberry (2004), and Denis and Osobov (2008), the total numbers of exchange-listed firms increased substantially from 1989 to the beginning of 2000s and ceased growing across countries except Japan and Hong Kong thereafter. In line with Denis and Osobov (2008) and Ferris et al. (2009), the overall proportion of dividend payers fell significantly from 1989 through to the early 2000s for companies in all sample countries except in Japan. Consistent with Eije and Megginson, (2008) and Ferris et al. (2009), the aggregate amount of dividends paid continuously increased in each country during the sample period.

More importantly, my investigation reveals incremental findings. Contrary to the conclusion of Ferris et al. (2009) (P.520), the declining number of dividend payers is actually not a global phenomenon. The number of dividend-paying firms remained relatively constant in the US and even continuously increased in Canada, Japan and Hong Kong over the entire sample period. This finding is partially consistent with Denis and Osobov (2008) whose sample period is covered by a part of my sample period. Further, the percentage of payers slightly restored in the US, Canada, Japan and Hong Kong from the beginning of 2000s to 2010, in support of the assumption of "reappearing dividends" proposed by Julio and Ikenberry (2004). However, the data is unable to document if this is a kind of sustainable trend since the scale of the increase in percentage payers is small and "reappearing dividends" is not evident in the UK, France, and Germany. In addition, there is clear evidence that new listings appear to become more reluctant to pay dividends, lending support for Fama and French (2001) and Denis and Osobov (2008) who argue that the reduction in percentage of payers is resulted from the soaring number of newly listed firms that do not pay dividends.

The patterns of stock repurchases differ among the countries in my sample. In accordance with Grullon and Michaely (2002) and of Skinner (2008), amongst the US firms, share repurchases have overwhelmed dividends to act as the dominant payout method in terms of absolute amounts. In constrast, the increasing real amount of share repurchases can also be observed in the UK, but a larger fraction of corporate payouts are still distributed in the form of cash dividends. In addition, the increasing importance of share repurchases can be observed in Canada in terms of the number of repurchasing firms. However, in other countries including Germany, France, Japan, and Hong Kong, share repurchases are far less important than cash dividends. Moreover, I find that companies in all countries retained stable dividend payout ratios and total payout ratios during the sample period, consistent with Lintner (1956) and Brav et al. (2005) who suggest that managers prefer dividend smoothing. This finding is comparable to Eije and Megginson (2008), but different from the findings of Ferris et al. (2009) who report that aggregate payout ratios generally increased across countries.

This research also examines the international trend in propensity to pay dividends and reveals several significant findings. The likelihood of paying dividends is positively related to firm size and profitability. In particular, my results strongly support DeAngelo, DeAngelo, and Stulz (2006) and Denis and Osobov (2008) who document that the earned/contributed capital mix has the significant effect on the likelihood to pay cash dividends. This finding contradicts Eije and Megginson (2008) who focus on a sample of European firms. In line with Denis and Osobov (2008), the impact of growth opportunities is somewhat mixed. The coefficient of market to book ratio is negative but not significant for Germany. The coefficients of total assets growth are of "wrong" signs or insignificant for some countries such as Germany and Japan. Moreover, in line with Eije and Megginson (2008), leverage is an important influencing factor, and it has an adverse effect on a firm's decision to pay dividends in the majority of sample countries. Even when controlling for these key characteristics, a declining propensity to pay dividends is confirmed in all sample countries, apart from Japan. Over 1996 to 2010, UK and German firms are different from US and Japan in terms of propensity to pay dividends. The percentage of actual dividend payers is more volatile than that of expected payers, implying that there are unobserved factors could possibly influence dividend-paying trends.

Previous studies, apart from Eije and Megginson (2009), are in dearth of evidence on the influential factors of share repurchases. I use country-specific data to examine the determinants of both dividend decisions and repurchases decisions. In the empirical tests examining the probability of paying dividends and the probability of repurchasing shares, I have the following findings. First, both the decisions of paying dividends and repurchasing shares are influenced by lifecycle-related firm characteristics including firm size, profitability, growth opportunities, earned equity, and leverage. However, similar to the finding of Eije and Megginson (2008), repurchases regressions show fewer significant coefficients than dividend regressions. These results generally suggest that the likelihood of paying out cash flows increases with the extent to which a firm matures. The other suggestion is that there are not differences in the effects of these lifecycle factors on the choice of payout method between dividends or repurchases. Second, there is some evidence that cash holdings are negatively related the decision to pay dividends, but positively related the decision to buy back shares, in line with Eije and Megginson (2008) and Lee and Suh (2011). R&D expenditure and technology intensity have a negative but country dependent influence on a firm's tendency to pay dividends. Third, the effect of M&A on the incidence of payouts is highly country-specific. It would be more meaningful to discuss the results for the US and the UK where more M&A observations are available. US acquirers are reluctant to pay dividends, possibly because acquisition as a form of investment reduces excess cash. Contrarily, dividend payers in the UK are more frequently to be acquirers. The gap between the US and the UK might be due to the different frequency of M&A cases in the two countries. By contrast, target firms in both the US and in the UK are more likely to pay dividends. This may indicate that companies tend to pay dividend when lacking profitable projects and thus confront a greater chance of being taken over. Fourth, acquirers in the US and in the UK have a greater inclination to repurchase shares, and this suggests that they wanted to use a flexible way of distributing cash. Fifth, firms that faced the risk of being de-listed are less likely to be dividend payers, consistent with the findings of DeAngelo and DeAngelo (1990) and DeAngelo et al. (1992). Sixth, there is little evidence to suggest that payout decisions are influenced by market sentiment, as argued by Baker and Wurgler (2004a). Finally, most repurchasing firms tend to be dividend payers as well, suggesting that repurchases and dividends are not perfect substitutes at least.

This chapter also examines the determinants of the amounts of corporate payouts by using dividends ratio and repurchases ratio as dependant variables. The results can be summarized as follows. First, repurchases regressions had a smaller number of statistically significant coefficients than dividend regressions. Market to book ratio is the only explanatory variable to have a significant effect on both dividend amounts and the repurchase amounts. The associated coefficients of market to book ratio suggest that firms with high market to book ratio are less likely to payout using dividends and repurchases, but if they did pay out, they paid out more. Lee and Suh (2011) present similar findings to show that the amount of repurchases is positively related to market to book ratio for US companies. Second, profitability, growth rate of total assets, and retained earnings are important factors in determining dividend amounts, and the associated signs are same as those made in respect of decisions to pay dividends. Firms with high cash holdings are reluctant to pay dividends, but if they determined to pay they will paid out more. One interesting finding is that large US companies are less likely to pay high dividends. Nevertheless, firm size remained as one of the strongest positive influencers on the dividend amounts paid out by UK companies. This might be because US firms distributed a substantial amount of cash through repurchases. However, there is weak evidence that M&A and catering factors influence the amounts of dividends paid and share repurchases.

To fill a gap in the existing literature, this part of study further investigates various changes in dividends. The relevant findings are as follows. First, firms that increased dividends are larger, have higher profitability, growth opportunities, retained earnings, and cash holdings than firms that did not change their dividend policy. Second, dividend-increasing firms are more likely to operate in the high technology sector in comparison to other control groups. In the US, firms that increase their dividend are more often to be acquirers, and less likely to be targets. In the majority of countries, dividend-increasing firms have a lower de-listing rate compared with firms in the other control groups. Third, dividend-increasing companies are associated with higher growth opportunities and cash holdings comparing with dividend-decreasing companies. The only consistent evidence found to support catering theory is that US dividend-increasing firms have a greater value-weighted dividend premium (EDP) than dividend-decreasing firms. Fourth, firms that started to pay dividends and firms that stopped paying differed in their life-cycle related characteristics, such as firm size, growth opportunities and earned/contributed equity mix. This is caused by the difference of age between control groups. In addition, there are several robust findings. Stop-paying companies burden heavier debt than the start-paying companies, confirming the expected negative relation between leverage and dividends. Start-paying companies are more likely to belong to the technology industry, and start-paying companies are less likely to be de-listed in the short-term. The findings in relation to US firms suggested that M&A activity could trigger a bigger chance of dividend initiation, and a small chance of dividend termination.

The empirical tests using Lintner model indicate that the link between cash dividends and earnings has weakened, in support of Choe (1990) and Brav, Graham, Harvey, and Michaely (2005). In line with Eije and Megginson (2008), the data demonstrate that dividends are still responsive to earnings and thereby international dividend patterns still reflect the relation suggested by Lintner model. We cannot rule out the possibility that the changes in the sensitivity of dividends to earnings and the adjustment speed of dividends are partially accounted for by the repurchases changes.

I use transition matrix to analyze the choice of payout methods made by firms. The results are generally in accordance with those presented by Grullon and Michealy (2002) and Lee and Suh (2011). Consistent with the implication of Linter (1956), companies should be very conservative to initiate dividend payout, but once they begin, they tend to continue. In addition, the results are in line with Guay and Harford (2000) who document that dividend increases relate to relatively permanent cash flow shocks and repurchases relate to transient shocks. I find that firms in the US and Canada are more likely to initiate payout in the form of repurchases comparing wity firms in other countries. This reinforces the notion that the substitution of repurchases for dividends is merely evident in the US or Canada.

Appendix 5-1

Logistic Panel Regressions for Explaining the Likelihood to Pay Dividends and Repurchase Shares

This table presents results from estimating logistic panel regressions for seven economies over sample period 1989-2010. Suggested by Petersen (2009), standard errors are corrected in two dimensions of firm and year. The specifications of explanatory variables are as follows. SIZE is a measure of firm size, which represents the percent of firms with smaller market capitalization in each stock market for every sample year. PROFIT, the proxy of profitability, is calculated as (book value of total assets - book value of equity + market value of equity)/book value of total assets. MTBV, a proxy of growth opportunities, is measured as the market value of total capital scaled by the book value of total assets. GOA, a proxy of growth opportunities, represents the annual growth rate of total assets. RETE refers to ratio of earned equity, which is measured as retained earnings scaled by total book equity. LEVERAGE is measured as long-term debt scaled by book value of total assets. LNAGE represents the logarithm of the number of years between base year and the observed year. CTAT is the ratio of cash to total assets in which cash represents the money available for use in the normal operations of the company. R&D is the proxy of R&D, measured as the amount of R&D divided by total assets. TIN3 equals to 1 if M&A takes place within 3 years of observed year for an acquirer. TAKENIN3 equals to 1 if M&A takes place within 3 years of observed year for a target firm. DLIN3 equals 1 if an observed firm is delisted within 3 years of year t and 0 otherwise. EDP, dividend premium, is calculated as the difference between the logarithm of the average market to book value of dividend payers and that of non-dividend payers (Baker and Wurgler, 2004a). IFDIV equals 1 if a repurchasing company is paying dividends and 0 otherwise. *p*-values are reported in parentheses and significance levels are indicated. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	US	Canada	UK	Germany	France	Japan	HK
Panel A. The dependent variable equals one if the firm pays dividends in year t and zero otherwise							
Intercept	-3.568***	-1.433***	-0.654***	-1.346***	-0.513	2.539***	-0.535**
	(0.00)	(0.00)	(0.01)	(0.00)	(0.14)	(0.00)	(0.04)
SIZE	2.747***	2.826***	2.437***	2.281***	2.923***	2.642***	2.879***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PROFIT	0.32***	4.79***	5.158***	4.231***	9.571***	11.227***	6.574***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
MTBV	-0.149***	-0.468***	-0.305***	-0.035	-0.431***	-0.918***	-0.492***
	(0.00)	(0.00)	(0.00)	(0.61)	(0.00)	(0.00)	(0.00)
GOA	-0.575***	-0.844***	-0.541***	-0.3*	-0.396***	0.707*	-0.556***
	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)	(0.07)	(0.00)
RETE	0.599***	0.535***	0.768***	0.841***	1.022***	2.203***	1.32***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LEVERAGE	-0.516**	0.815*	-0.769***	-0.769*	-0.847**	-2.45***	-1.748***
	(0.02)	(0.06)	(0.01)	(0.07)	(0.05)	(0.00)	(0.00)
LNAGE	0.84***	0.044	0.678***	0.373***	0.081	-0.198**	0.051
	(0.00)	(0.7)	(0.00)	(0.00)	(0.51)	(0.04)	(0.46)
CTAT	-2.471***	-2.21***	-2.127***	-0.836*	-0.611	0.547	0.071
	(0.00)	(0.00)	(0.00)	(0.08)	(0.52)	(0.24)	(0.85)
R&D	-10.878***	-7.16**	-4.556***	-4.87***	-7.128***	-3.641	-7.83**
	(0.00)	(0.02)	(0.00)	(0.01)	(0.00)	(0.23)	(0.04)
TIN3	-0.097	-0.217	0.133	-	-1.376	0.48	-
	(0.42)	(0.69)	(0.68)	-	(0.14)	(0.24)	-
TAKENIN3	-0.085	-0.667***	0.036	-1.556***	-0.774	-1.334***	-
	(0.36)	(0.00)	(0.85)	(0.01)	(0.27)	(0.00)	-
DLIN3	-0.43***	-0.731***	-0.29**	-0.264	-0.437***	-1.158***	-0.571***
	(0.00)	(0.00)	(0.04)	(0.17)	(0.01)	(0.00)	(0.01)
EDP	0.244	0.371	-1.756	-0.035	-0.806	-2.664***	0.902
	(0.9)	(0.55)	(0.2)	(0.97)	(0.32)	(0.00)	(0.17)

Obs	64261	11779	28319	9812	10589	41614	10856
χ2	13540.38	1930.99	5421.04	2098.99	2091.11	5817.55	2097.29
Pseudo R-sq	0.31	0.32	0.42	0.27	0.29	0.34	0.36
Panel B. The dependent variable equals one if a firm repurchases shares in year t and zero otherwise							
Intercept	-2.275***	-2.179***	-4.251***	-5.238***	-5.573***	-3.088***	-3.787***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
SIZE	0.336*	-0.24	0.698***	1.221*	1.509***	1.668***	0.25
	(0.1)	(0.39)	(0.00)	(0.07)	(0.00)	(0.00)	(0.52)
PROFIT	0.1***	1.04***	1.493***	-0.102	1.288	-1.045	0.06
	(0.01)	(0.00)	(0.00)	(0.9)	(0.2)	(0.35)	(0.87)
MTBV	-0.147***	-0.313***	-0.027	-0.101	-0.248*	-1.351***	-0.336***
	(0.00)	(0.00)	(0.49)	(0.38)	(0.1)	(0.00)	(0.00)
GOA	-0.886***	-0.559***	-0.846***	-0.454	-0.82***	-1.59**	-0.126
	(0.00)	(0.00)	(0.00)	(0.21)	(0.00)	(0.02)	(0.47)
RETE	0.536***	0.411***	0.165***	0.137	0.209*	0.275**	0.095
	(0.00)	(0.00)	(0.00)	(0.36)	(0.08)	(0.04)	(0.23)
LEVERAGE	-0.439***	0.245***	0.43***	0.361**	0.743***	0.125	0.363***
	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.37)	(0.00)
LNAGE	0.35***	0.281	0.404	-0.731	-1.095	-1.001*	-0.148
	(0.00)	(0.45)	(0.29)	(0.29)	(0.11)	(0.07)	(0.8)
CTAT	0.529**	1.693***	0.606**	1.102	-0.345	0.383	1.531***
	(0.05)	(0.00)	(0.03)	(0.44)	(0.8)	(0.41)	(0.00)
R&D	-1.354***	2.571***	-0.463	2.336	5.579***	-3.515*	6.231
	(0.00)	(0.00)	(0.69)	(0.23)	(0.00)	(0.1)	(0.11)
TIN3	0.073	-0.711	0.325	-	-	-1.029*	-
	(0.56)	(0.21)	(0.21)	-	-	(0.07)	-
TAKENIN3	-0.11	0.321*	-0.208	1.972**	-0.271	-0.316	-
	(0.13)	(0.09)	(0.3)	(0.05)	(0.79)	(0.41)	-
DLIN3	0.054	-0.007	0.002	-0.822**	0.175	-0.367*	-0.318
	(0.43)	(0.96)	(0.98)	(0.03)	(0.57)	(0.08)	(0.57)
IFDIV	0.291***	0.487***	0.618***	-0.066	0.209	0.657***	0.644***
	(0.00)	(0.00)	(0.00)	(0.73)	(0.4)	(0.00)	(0.00)
Obs	59790	8291	15760	6341	6475	24348	7292
χ2	4509.43	329.71	777.67	45.42	251.85	537.43	131.05
Pseudo R-sq	0.099	0.087	0.120	0.039	0.104	0.067	0.045

Appendix 5-2

OLS Panel Regressions for Explaining the Amounts of Dividends and Repurchases

This table presents results from estimating OLS panel regressions for seven economies over sample period 1989-2010. Suggested by Petersen (2009), standard errors are corrected in two dimensions of firm and year. The specifications of explanatory variables are as follows. *SIZE* is a measure of firm size, which represents the percent of firms with smaller market capitalization in each stock market for every sample year. *PROFIT*, the proxy of profitability, is calculated as (book value of total assets - book value of equity + market value of equity)/book value of total assets. *MTBV*, a proxy of growth opportunities, is measured as the market value of total capital scaled by the book value of total assets. *GOA*, a proxy of growth opportunities, represents the annual growth rate of total assets. *RETE* refers to ratio of earned equity, which is measured as retained earnings scaled by total book equity. *LEVERAGE* is measured as long-term debt scaled by book value of total assets. *LNAGE* represents the logarithm of the number of years between base year and the observed year. *CTAT* is the ratio of cash to total assets in which cash represents the money available for use in the normal operations of the company. *R&D* is the proxy of R&D, measured as the amount of R&D divided by total assets.*TIN3* equals to 1 if M&A takes place within 3 years of observed year for an acquirer. *TAKENIN3* equals to 1 if M&A takes place within 3 years of observed year for a target firm. *DLIN3* equals 1 if an observed firm is delisted within 3 years of year t and 0 otherwise. *EDP*, dividend premium, is calculated as the difference between the logarithm of the average market to book value of dividend payers and that of non-dividend payers (Baker and Wurgler, 2004a). *p*-values are reported in parentheses and significance levels are indicated. *denotes significance at 10%, ** at 5% and *** at 1% respectively.

Variable	US	Canada	UK	Germany	France	Japan	HK
Panel A. The dependent variable is cash dividends paid scaled by total assets							
Intercept	0.021***	0.044***	0.008***	0.014***	0.007***	0.004***	0.011***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
SIZE	-0.006**	-0.0002	0.003***	-0.005	-0.002	-0.001**	-0.002
	(0.02)	(0.98)	(0.00)	(0.14)	(0.3)	(0.05)	(0.54)
PROFIT	0.006***	0.097***	0.04***	0.088***	0.109***	0.018***	0.107***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
MTBV	0.01***	0.011***	0.008***	0.006***	0.007***	0.002***	0.015***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GOA	-0.019***	-0.013***	-0.013***	-0.017***	-0.015***	-0.007***	-0.023***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RETE	-0.005***	-0.04***	0.004***	-0.012**	-0.006***	0.004***	-0.005*
	(0.00)	(0.00)	(0.00)	(0.02)	(0.01)	(0.00)	(0.07)
LEVERAGE	-0.004	-0.053***	-0.014***	-0.024***	-0.017***	-0.011***	-0.053***
	(0.26)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LNAGE	-0.002**	-0.005**	0.001***	0.001	0.002**	0.0002	0.0003
	(0.04)	(0.03)	(0.00)	(0.39)	(0.03)	(0.34)	(0.69)
CTAT	0.047***	-0.013	0.02***	0.035**	0.01	0.006***	0.026***
	(0.00)	(0.54)	(0.00)	(0.02)	(0.26)	(0.00)	(0.00)
R&D	-0.012	-0.045	-0.014	0.076*	-0.004	0.028***	0.103
	(0.55)	(0.54)	(0.23)	(0.06)	(0.86)	(0.00)	(0.36)
TIN3	-0.002	0.025	-0.001	-	0.002	-0.002***	-
	(0.21)	(0.29)	(0.58)	-	(0.42)	(0.00)	-
TAKENIN3	-0.004***	-0.008**	-0.001	-0.003	-0.003*	0.0001	-
	(0.00)	(0.05)	(0.25)	(0.71)	(0.07)	(0.93)	-
DLIN3	0.002	0.005	0.0003	-0.006	0.002*	0.001	0.008
	(0.19)	(0.23)	(0.79)	(0.13)	(0.1)	(0.13)	(0.19)
VDP	-0.013	-0.034***	0.0001	-0.008	0.004	0.001	-0.002
	(0.21)	(0.01)	(0.99)	(0.39)	(0.25)	(0.73)	(0.76)
Obs	20908	3818	18573	5359	6414	34742	5975

F	103.05	42.88	212.14	17.05	52.54	473.71	109.49
R-sq	0.179	0.29	0.27	0.06	0.23	0.21	0.30
Panel B. The dependent variable is the amount of repurchases over total assets							
Intercept	0.022***	0.055**	0.025	0.072	0.054***	-0.001	-0.037*
	(0.00)	(0.02)	(0.14)	(0.3)	(0.00)	(0.85)	(0.06)
SIZE	0.011***	-0.012	0.001	-0.115*	-0.029***	0.001	-0.011
	(0.00)	(0.41)	(0.89)	(0.1)	(0.00)	(0.89)	(0.34)
PROFIT	0.002	-0.034*	0.022	-0.108	0.069*	-0.017	-0.131**
	(0.35)	(0.09)	(0.33)	(0.43)	(0.06)	(0.45)	(0.05)
MTBV	0.018***	0.025***	0.016***	0.049**	0.017***	0.021***	0.035***
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
GOA	-0.013***	0.012	-0.004	-0.033	0.03	-0.014	0.021**
	(0.01)	(0.46)	(0.59)	(0.76)	(0.32)	(0.25)	(0.03)
RETE	0.008***	-0.007	0.001	-0.025	0.016**	0.004	-0.02***
	(0.00)	(0.2)	(0.63)	(0.36)	(0.04)	(0.12)	(0.01)
LEVERAGE	-0.006	-0.011	-0.004	-0.01	-0.011*	-0.002	0.012**
	(0.26)	(0.12)	(0.49)	(0.71)	(0.1)	(0.22)	(0.02)
LNAGE	-0.005***	-0.067*	0.005	-0.008	-0.021	-0.015**	-0.064**
	(0.00)	(0.09)	(0.54)	(0.93)	(0.57)	(0.04)	(0.02)
CTAT	0.013	-0.071	0.042**	0.198	0.051	0.014	-0.005
	(0.27)	(0.11)	(0.05)	(0.36)	(0.59)	(0.11)	(0.86)
R&D	0.07***	-0.084	0.094	-0.009	-0.011	0.037	-0.073
	(0.00)	(0.31)	(0.29)	(0.97)	(0.93)	(0.48)	(0.75)
TIN3	-0.005	-0.002	-0.016*	-	-	-0.003	-
	(0.36)	(0.92)	(0.07)	-	-	(0.86)	-
TAKENIN3	-0.001	-0.008	-0.004	-	-	-0.003	-
	(0.69)	(0.61)	(0.62)	-	-	(0.54)	-
DLIN3	0.005*	0.014	0.01*	0.14	0.026	0.003	0.002
	(0.1)	(0.41)	(0.09)	(0.24)	(0.17)	(0.2)	(0.72)
IFDIV	-0.012***	0.003	-0.006	0.023	-0.014	-0.001	0.007
	(0.00)	(0.6)	(0.55)	(0.5)	(0.41)	(0.59)	(0.32)
Obs	12132	946	1342	126	273	1483	469
F	87.81	5.02	5.35	2.22	3.47	9.12	1.90
R-sq	0.174	0.099	0.095	0.249	0.173	0.188	0.271

Chapter Six

Summaries and Conclusions

This thesis primarily aims to contribute to the literature of corporate dividend decisions by providing new insights into the main dividend theories. The first and second empirical chapters investigate the dividend behavior of IPOs by relating a number of company characteristics and IPO-specific factors to dividend decisions made by IPOs. The third empirical chapter analyses international trends in dividend payment and explores the determinants of various corporate payout activities.

6.1 Chapter 3

This empirical study examines two aspects of post-IPO decision-making behavior: the decision to initiate dividends and the timing of dividend initiation. I investigate how firm characteristics and IPO-related factors affect dividend decision making of IPOs through theoretically motivated empirical tests basing on large UK-based samples. Although existing US-based studies (Bulan, Subramanian and Tanlu, 2007; Jain, Shekhar and Torbey, 2009; Kale, Kini and Payne, 2012) contribute to researching into the relation between IPO and aftermarket dividend decisions, the empirical evidence provided is often controversial.

My sample consists of 1707 London Stock Exchange-based companies issued during the period 1990 to 2010. In developing testable hypotheses, I explore the theoretical links between IPO characteristics and dividend policy by combining the theories underlying dividends and IPOs. I use univariate analysis, cross-sectional logistic regression model and logistic unbalanced panel regression model to examine the determinants of IPOs' decision to pay dividends. I use univariate analysis and Cox Proportional Hazard (CPH) model to examine the determinants of the timing of dividend initiation. In addition, I estimate linear probability model (LPM) regressions and ordinal regression model to check the robustness of the results gained.

The main findings of Chapter 3 can be summarised as follows. The overall results show that the factors that causing greater (smaller) incidence to initiate dividends are associated with shorter (longer) time intervals between IPO and dividend initiation. The most homogeneous results are associated with the life cycle theory and catering theories. There are also some empirical results in support of signaling and agency theory. The empirical tests do not negate any of the major dividend theories.

Consistent with the prediction of dividend signaling theory, both managerial ownership and underwriter reputation are positively associated with the likelihood of initiating dividends. The line of argument is that IPOs with superior intrinsic value have the capability and need to pay dividends (Allen and Faulhaber, 1989). On the other hand, high-quality firms tend to have high managerial ownership (Pyle, 1977; Ross, 1977), and be sponsored by prestigious underwriters (Booth and Smith, 1986). However, by contrast, inconsistent with signaling, VC backing is found to be a factor with negative effect on the likelihood to pay dividends, and the impact of the institutional ownership on the decision to initiate dividends of IPOs is not significant.

The negative effect of underpricing on dividend initiation does not align with Allen and Faulhaber's (1989) IPO signaling which suggest IPOs signal intrinsic value by discounting offer price and are more likely to pay dividends. Instead, this finding can be explained by Rock's "winner's curse" (1986) and the implication of Dividend Discount Model. A line of argument is that paying no dividends or postponing the dividend payment means the information asymmetry is substantial, and the issuing firms would intentionally lower the offer price to compensate the uninformed investors. Similarly, the observed negative relation between the full lockup restriction period and the propensity to pay dividends may suggest that the information asymmetry would become more serious if no dividends are paid out and in such case the more restrictive lock-in provisions will be required.

According to substitute hypothesis of agency costs, weak corporate governance leads to higher demand of dividend payouts (Rozeff, 1982; Jensen, 1986; Smith and Watts, 1992; Gaver and Gaver, 1993; LaPorta et al., 2000; Officer, 2006). The results show that propensity of dividend initiation is negatively influenced by the full lockup restriction period, VC backing and managerial stock option. My test contributes to literature by confirming the negative relation between lockup length and dividends. In preceding literature, only Brav and Gompers (2003) report a negative but insignificant relationship. The negative relation between lockup length and dividends is in line with the finding of Jain et al. (2009). This implies that venture capitalists enhance the monitoring for the backed companies (Chan, 1983; Barry et al., 1990; Megginson and Weiss, 1991; Bergloff, 1994; Hellmann, 2002; Lee and Wahal, 2004; Cumming and Johan; 2008; Krishnan et al., 2011) and, as a result, the demand of dividends declines. The negative effect of managerial options is consistent with the findings reported by Smith and Watts, (1992), Yermack (1995), Weisbenner (2000), and Fenn and Liang (2001).

By contrast, consistent with the complement assumption of agency costs which suggests that dividend payment is a complement for corporate governance (LaPorta et al., 2000; Fenn and Liang, 2001; Grinstein and Michaely, 2005), managerial ownership and leverage are observed to have positive association with the inclination of dividend initiation. In addition, the results show that IPOs' preference to initiate dividends is adversely influenced by the growth opportunities of IPOs, technology intensity and issuing on AIM, consistent with free cash flow hypothesis.

Consistent with the suggestion of life cycle theory (Grullon et al., 2002; DeAngelo et al., 2006), VC backing and lock-in agreement have negative effect on the dividend policy of IPOs. According to lifecycle theory, dividend policy is positively affected by the maturity. Venture capitalists are assumed to prefer early-stage companies (Lerner, 1994; Gompers, 1995; Bergemann and Hege, 1998; Gompers and Lerner, 2000, 2003; Lee and Wahal, 2004; Cumming and Johan, 2008 and Krishnan, 2011). Lock-in agreements tend to be more restrictive for young firms (Brav and Gompers, 2000, 2003).

Furthermore, consistent with lifecycle theory, IPO firms with larger size, higher profitability and lower growth opportunities are found to be more likely to initiate dividends and pay earlier, In line with previous studies (Fama and French, 2001; Bulan, et al., 2007; Denis and Osobov, 2008; Eije and Megginson, 2008; Ferris et al., 2009 and Kale et al., 2012). The other findings in support of lifecycle theory include the negative effects of technology focus and AIM issuance on initiation propensity. In addition, as Eije and Megginson (2008) argued, the positive effect of leverage is consistent with life cycle hypothesis since mature firms may be associated with high leverage.

Finally, the tests show that the IPOs issued in years when markets put a price premium on dividend paying payers are more likely to become dividend payers and tend to initiate dividends earlier, consistent with the implication of catering theory (Baker and Wurgler, 2004).

6.2 Chapter 4

This empirical chapter focuses on investigating the determining factors of the dividend policies presented in IPO prospectuses. This study is original to examine the dividend policy declared in IPO prospectuses using pre-IPO data, which have never been used in preceding literature.

In this investigation, 932 UK IPO prospectus statements published between 1996 and 2010 are examined. Two categories of variables are employed in this part of study: pre-IPO financial performance and a fraction of IPO-related factors, which are used in Chapter 3. Historical financial records relating to pre-IPO financial performance are hand collated from profit and loss statements, balance sheets, and statements of cash flow for 3 consecutive pre-IPO years as reported in the offering prospectuses. All the sample firms are classified into four control groups according to the decision makers' attitudes toward dividend payment as stated in the IPO prospectuses. Type 1 and Type 2 firms have stronger willingness to initiate dividends, comparing with Type 3 and Type 4 firms, in terms of the proportion of payers and the timing of dividend initiation. Key firm characteristics are then compared between the groups using unique categorical analyses, cross-sectional binary logistic regression and ordinal logistic regression analyses. In general, the results suggest that the pre-IPO financial position of a firm appears to exert substantial influence on IPO policy. The empirical tests in general support lifecycle theory, but the evidence on the signaling and the agency theory is relatively mixed. The results of binary logistic regression do not support catering theory. The main findings are as follows.

IPOs with superior performance (measured by last fiscal year ratios, 3-year averages and growth ratios) in pre-IPO profitability and cash inflow from operating activities tend to make active dividend policies such as Type 1 or Type 2. This finding is consistent with the implication of Lintner (1956) model in which dividend policy follows shifts in long run, sustainable levels of earnings and managers are prudent to draw the initial dividend policies in order to prevent from reversing dividend changes. These findings are also consistent with Miller (1987), Healy and Palepus (1988) and Benartzi, Michaely and Thaler (1997) who document that there is a strong past link between a firm's earnings and changes in dividend policies. In this sense, the dividend policy presented in IPO prospectuses signal the past financial performance of firms.

In line with signaling, IPOs associated with prestigious underwriters are more inclined to specify active dividend policies. Jain et al. (2009) also present a similar result. Specifically, prestigious underwriters provide certification to high quality IPOs who have the ability and demand to undertake high dividend payments. Consistent with the argument of Kale et al. (2012) which is derived from signaling, higher institutional ownership significantly lead IPOs to choose relatively conservative dividend strategies when going public. Specifically, IPOs are more likely to initiate dividends when the current level of institutional ownership is lower than what it should be so that they can attract informed institutional investors firms.

I only find weak evidence in support of signaling which predicts a positive relation between the likelihood of undertaking active dividend policy and the level of underpricing. There is strong evidence that IPOs stating active dividend in prospectuses are more likely to be subject to longer full lockup restriction period, implying that the length of lockup period may be a substitute for dividends to deal with the information asymmetry between insiders and outside investors at the time of IPO. Inconsistent with signaling, the relation between IPOs' dividend policy and managerial ownership is not significant. Contrary to signaling, VC backing has a negative impact on choosing active dividend policy.

Consistent with the substitute assumption of agency costs that suggests that enhanced corporate governance leads to lower demand of dividend payouts (Rozeff, 1982; Jensen, 1986; Smith and Watts, 1992; Gaver and Gaver, 1993; LaPorta et al., 2000; Officer, 2006), the length of full lockup restriction period negatively influences on the decision of choosing active dividend policy. Similarly, consistent with the substitute assumption of agency costs, IPOs with VC backing, high institutional ownership or high level of managerial stock options tend to be relatively conservative in stating dividend policy in prospectuses.

Consistent with the predictions of free cash flow hypothesis (Jensen, 1986; Lang and Litzenberger, 1989; Grullon, Michaely and Swaminathan, 2002), the results show that IPOs with higher cash flows and lower capital expenditures tend to choose active dividend policies when going public. In addition, IPOs in high technological sectors or IPOs issued on AIM are less likely to specify more active dividend policies in prospectuses. In sum, the most results support agency theory, except for the findings that the effect of managerial ownership is not significant and the results in relation to leverage is mixed.

Consistent with the predictions of the lifecycle theory, venture-capital backed IPOs tend to declare relatively conservative dividend policies in prospectuses. This finding is also in line with the argument that venture capitalists tend to pursue capital gains from short-term investments rather than long-term dividend streams (Lerner, 1994 and Field and Hanka, 2001). In addition, consistent with the implications of lifecycle theory, the severity of lock-in agreements adversely affects initial dividend initiation. This argument suggests that the degree of a firm's maturity has a negative relation with the severity of lock-in agreements (Brav and Gompers, 2000, 2003). In accordance with Fama and French (2001) and Deshmukh (2003), larger IPOs are more progressive in choosing dividend policies at the time of IPO assuming firm size proxies for the maturity of firms. IPOs in high technological sectors and IPOs issued on AIM are less likely to make active dividend policies.

In addition, the coefficients of dividend premium in binary logistic regressions are not significant, inconsistent with the prediction of dividend catering theory. Finally, more findings need to be noticed as well. There is a positive relation between the asset turnover ratio and the acceptance of active dividend policies. IPOs issued in the 'internet bubble' period opt for relatively conservative dividend strategies. IPOs issued in 2000s are less likely to adopt active dividend policies than those issued in the 1990s.

Furhtermore, I find that Type1 IPOs have lower cumulative abnormal returns to dividend initiation announcements compared with non-Type1 counterparts. This supports the conjecture that Type1 IPOs release sufficient information through dividend policies declared in offering prospectuses and therefore their formal dividend initiations fail to shock the market. While TYPE2 has the significant CARs over the major event windows, neither TYPE3 nor TYPE4 has the statistically significant CARs. A possible explanation is that investors do not regard the dividend disbursement made by TYPE3 are TYPE4 firms, which are more likely technology focused companies, as good news. Dividend-paying companies outperform non-dividend paying counterparts during three post-IPO years, indicating that non-dividend initiating IPOs rather than dividend-initiating ones account for the decline in long-run underperformance. The additional remarkable finding is that Type1 IPOs do not exhibit declining long-run performance. The cumulative average market-adjusted returns for Type1 IPOs remain positive during the 36 holding months after IPO. Long-run performance descends orderly from Type1 to

Type4 in the most of observed post-IPO months. This finding supports the argument that the dividend policies stated in prospectuses communicate the information, and thus reduce the possibilities that outside investors are overoptimistic over the prospect of the invested companies and that managers overstate the pre-IPO financial data at IPO stage.

6.3 Chapter 5

This chapter examines international trends in dividend payments across seven developed economies from 1989 to 2010, and looks at the extent to which repurchases play a role in dividend policy as well. My results corroborate some findings reported in previous studies. In line with Julio and Ikenberry (2004) and Denis and Osobov (2008), the total numbers of exchange-listed firms increased substantially from 1989 to the beginning of 2000s and ceased growing across countries except Japan and Hong Kong thereafter. In line with Denis and Osobov (2008) and Ferris et al. (2009), the overall proportion of dividend payers fell significantly from 1989 through to the early 2000s for companies in all sample countries except in Japan. Consistent with Eije and Megginson, (2008) and Ferris et al. (2009), the aggregate amount of dividends paid continuously increased in each country during the sample period.

Contrary to the conclusion of Ferris et al. (2009) (P.520), the declining number of dividend payers is actually not a global phenomenon. The number of dividend-paying firms remained relatively constant in the US and even continuously increased in Canada, Japan and Hong Kong over the entire sample period. This finding is partially consistent with Denis and Osobov (2008) whose sample period is covered by a part of my sample period. Further, the percentage of payers slightly restored in the US, Canada, Japan and Hong Kong from the beginning of 2000s to 2010, in support of the assumption of "reappearing dividends" proposed by Julio and Ikenberry (2004). However, the data is unable to document if this is a kind of sustainable trend since the scale of the increase in percentage payers is small and "reappearing dividends" is not evident in the UK, France, and Germany. In addition, there is clear evidence that new listings appear to become more reluctant to pay dividends, lending support for Fama and French (2001) and Denis and Osobov (2008) who argue that the reduction in percentage of payers is resulted from the soaring number of newly listed firms that do not pay dividends.

The patterns of stock repurchases differ among the countries in my sample. In accordance with Grullon and Michaely (2002) and of Skinner (2008), amongst the US firms, share repurchases have overwhelmed dividends to act as the dominant payout method in terms of absolute amounts. In constrast, the increasing real amount of share repurchases can also be observed in the UK, but a larger fraction of corporate payouts are still distributed in the form of cash dividends. In addition, the increasing importance of share repurchases is observable in Canada. However, in other countries including Germany, France, Japan, and Hong Kong, share repurchases are far less important than cash dividends. Moreover, I find that companies in all countries retained stable dividend payout ratios and total payout ratios during the sample period, consistent with Lintner (1956) and Brav et al. (2005) who suggest that managers prefer dividend smoothing. This finding is comparable to Eije and Megginson (2008), but different from the findings of Ferris et al. (2009) who report that aggregate payout ratios generally increased across countries.

This research also examines the international trend in propensity to pay dividends and reveals several significant findings. The likelihood of paying dividends is positively related to firm size and profitability. In particular, my results strongly support DeAngelo, DeAngelo, and Stulz (2006) and Denis and Osobov (2008) who document that the earned/contributed capital mix has the significant effect on the likelihood to pay cash dividends. This finding contradicts Eije and Megginson (2008) in which European data are used in tests. In line with Denis and Osobov (2008), the impact of growth opportunities is somewhat mixed. The coefficient of market to book ratio is negative but not significant for Germany. The coefficients of total assets growth are of “wrong” signs or insignificant for some countries such as Germany and Japan. Moreover, in line with Eije and Megginson (2008), debt ratio is an important influencing factor with an adverse effect on a firm’s decision to pay dividends in the majority of sample countries. Even when controlling for these key characteristics, a declining propensity to pay dividends is confirmed in all sample countries, apart from Japan. During the period 1996-2010, firms in UK and German differ from the counterparts in US and Japan in terms of propensity to pay dividends.

Previous studies, apart from Eije and Megginson (2009), and Alzahrani and Lasfer (2012), did not consider fully the drivers of share repurchases. I use country-specific data to examine the determinants of both dividend decisions and repurchases decisions. In the empirical tests examining the probability of paying dividends and the probability of repurchasing shares, I have the following findings. First, lifecycle-related firm characteristics including firm size, profitability, growth opportunities, earned equity, and debt have influences on both the decisions of paying dividends and repurchasing shares. However, similar to the finding of Eije and Megginson (2008), and Alzahrani and Lasfer (2012), repurchases regressions show fewer significant coefficients than dividend regressions. These results generally suggest that the likelihood of paying out cash flows increases with the extent to which a firm matures. The other suggestion is that there are not differences in the effects of these lifecycle factors on the choice of payout method between dividends or repurchases. Second, there is some evidence that cash holdings are negatively related the decision to pay dividends, but positively related the decision to buy back shares, in line with Eije and Megginson (2008) and Lee and Suh (2011). R&D expenditure and technology intensity have a negative but country dependent influence on a firm's tendency to pay dividends. Third, the effect of M&A on the incidence of payouts is highly country-specific. It would be more meaningful to discuss the results for the US and the UK where more M&A observations are available. US acquirers are reluctant to pay dividends, possibly because acquisition as a form of investment reduces excess cash. Contrarily, dividend payers in the UK are more frequently to be acquirers. The gap between the US and the UK might be due to the different frequency of M&A cases in the two countries. By contrast, target firms in both the US and in the UK are more likely to pay dividends. This may indicate that companies tend to pay dividend when lacking profitable projects and thus confront a greater chance of being taken over. Fourth, acquirers in the US and in the UK have a greater inclination to repurchase shares, and this suggests that they wanted to use a flexible way of distributing cash. Fifth, firms that faced the risk of being de-listed are less likely to be dividend payers, consistent with the findings of DeAngelo and DeAngelo (1990) and DeAngelo et al. (1992). Sixth, there is little evidence to suggest that payout decisions are influenced by market sentiment, as argued by Baker and Wurgler (2004a). Finally, most repurchasing firms tend to be dividend payers as well, suggesting that repurchases and dividends are not perfect substitutes at least.

This chapter also examines the determinants of the amounts of corporate payouts by using dividends ratio and repurchases ratio as dependant variables. The results can be summarized as follows. First, repurchases regressions had a smaller number of statistically significant coefficients than dividend regressions. Market to book ratio is the only explanatory variable to have a significant effect on both dividend amounts and the repurchase amounts. The associated coefficients of market to book ratio suggest that firms with high market to book ratio are less likely to payout using dividends and repurchases, but if they did pay out, they paid out more. Lee and Suh (2011) present similar findings to show that the amount of repurchases is positively related to market to book ratio for US companies. Second, profitability, growth rate of total assets, and retained earnings are important factors in determining dividend amounts, and the associated signs are same as those made in respect of decisions to pay dividends. Firms with high cash holdings are reluctant to pay dividends, but if they determined to pay they will paid out more. One interesting finding is that large US companies are less likely to pay high dividends, while firm size has positive effect on the dividend amounts paid out by UK companies. This might be because US firms distributed a substantial amount of cash through repurchases. However, there is weak evidence that M&A and catering factors influence the amounts of dividends paid and share repurchases.

To fill a gap in the existing literature, this part of study further investigates various changes in dividends. The relevant findings are as follows. First, firms that increased dividends are larger, have higher profitability, growth opportunities, retained earnings, and cash holdings than firms that did not change their dividend policy. Second, dividend-increasing firms are more likely to operate in the high technology sector. In the US, firms that increase their dividend are more likely to be acquirers or firms that merged with other firms within 3 years. In the majority of countries, dividend-increasing firms have a lower de-listing rate compared with firms in the other control groups. Third, growth opportunities and cash holdings of dividend-increasing companies are relatively higher. The only consistent evidence found to support catering theory is that US dividend-increasing firms have a greater value-weighted dividend premium (EDP) than dividend-decreasing firms. Fourth, firms that started to pay dividends and firms that stopped paying differed in their life-cycle related characteristics, such as firm size, growth opportunities and earned/contributed equity mix. This is caused by the difference of age between control groups. In addition, there are several robust findings. Stop-paying companies burden heavier debt than the start-paying companies, confirming the expected negative relation between leverage and dividends. Start-paying companies are more likely to belong to the technology industry, and start-paying companies are less likely to be de-listed in the short-term. Findings in relation to US firms suggested that M&A activity could trigger a bigger chance of dividend initiation, and a small chance of dividend termination.

The empirical tests using Lintner model indicate that the link between cash dividends and earnings has weakened, in line with the findings of Choe (1990) and Brav, Graham, Harvey, and Michaely (2005). Nevertheless, in line with Eije and Megginson (2008), the results show that dividends are still responsive to earnings and thereby international dividend patterns still reflect the relation suggested in Lintner model. We cannot rule out the possibility that the changes in the sensitivity of dividends to earnings and the adjustment speed of dividends are partially accounted for by the repurchases changes.

I use transition matrix to analyze the choice of payout methods made by firms. The results are in accordance with those presented by Grullon and Michealy (2002), and Lee and Suh (2011). Consistent with the implication of Linter (1956), companies should be very conservative to initiate dividend payout, but once they begin, they tend to continue. In addition, the results are in line with Guay and Harford (2000) who document that dividend increases relate to relatively permanent cash flow shocks and repurchases relate to transient shocks. I find that the firms in the US and Canada are more likely to initiate payout in the form of repurchases. This reinforces the notion that the substitution of repurchases for dividends is merely evident in the US or Canada.

Limitations and ways for further research

My thesis also enlightens a number of other promising areas for future research. A potential interesting topic would be to trace the market reaction caused if IPO firms with certain characteristics change their initial dividend policy. For example, assuming firms with rigorous lockup agreements suffer more serious information asymmetry or agency conflicts than other firms, dividend initiation/omission for these firms will carry more information and the market shock is expected to more significant accordingly. I can also research the short and long-term aftermarket performance in respect of IPOs' dividend policy. For example, it is interesting to compare the short/long performance between IPOs with different preferences of paying dividends at stage of IPO. In such comparisons, I can control particular IPO characteristics such as high technology focus. In addition, future research may go in depth into the impact of ownership structure (e.g. venture capitalists stakes and ownership of institutions), coporate incentives (e.g. stock options and executives' bonus) on dividend policy. Such research may focus on the main dividend theories and use time-series or multinational data. Furthermore, by reviewing literature I find that the investigation on the interrelationship between M&A practice and dividend policy need to be explored in the future research. In order to investigate this issue more deeply, researcher would better concentrate on established markets such as UK or US.

In this thesis, I attempted to contribute to the literature on dividends by providing some new insights into the dividend policy of newly listed firms and by comparing dividends and share repurchases across a number of countries. The literature is extensive on these issues, but I attempted to disentangle my research by focusing on new factors that might influence dividends and by collecting by hand a large number of data from prospectuses of a sample of UK IPOs. Although I extended the sample to 2010, I was unable to assess fully the impact of the recent global financial crisis that is likely to affect firms' dividend policy, as I was focusing on other fundamental issues. This may be a way for further research.

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