Cash Dividend Policy and Firm Risk: UK Evidence

Ola Atia

School of Business

University of Salford, Salford, UK

Submitted in Partial Fulfilment of the Requirements of

the Degree of Doctor of Philosophy, December 2016

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

DEDICATION

I would like to dedicate this thesis to my husband, my children, my mother, my brother and to the memory of my father.

ACKNOWLEDGEMENTS

I would like to gratefully and sincerely thank all the great people who have supported me during the journey of my Ph.D. I am most grateful to my supervisor, Dr. Jia Liu, for her kindness, constant support, and excellent guidance. This doctoral thesis would not have been possible without her encouragement, her knowledge, and her constructive comments. She has always been supportive of innovative ideas and provided me with extensive motivation.

I would also like to present my sincerest gratitude to my local advisor, Professor Tarek Eldomiaty, who inspired me to pursue my Ph.D. in the first place. His high academic standards and achievements set an example for me. His encouragement, extensive knowledge, and patience led me right through the years to finish my research.

I would also like to thank Salford Business School for providing me with the opportunity to complete my doctoral research. I am also grateful to the postgraduate support team at Salford Business School for their continuous support.

I must present my greatest thanks to my beloved husband, Sherif Korashy, who is the most important person in my life, for his utmost patience and strong support during my years of study. I would also like to thank my great mother for her deep love, encouragement, and patience during the past years. Her absolute confidence in me helped me through all the hard times.

I am also indebted to my children, Salma and Mohamed, for their love and for sharing the load of my studies. I am deeply sorry for the times I spent apart from you. I love you so much.

I would also like to thank my dear brother, Wael Atia, for his great support and wise advice.

Many special thanks go to my colleagues at MIU for their support and encouragement.

ABSTRACT

This thesis aims at investigating the determinants of the dividend payout ratio in the UK. It contributes to the literature by examining the potential influence of systematic and unsystematic risks on the relationship between the dividend payout ratio and its determinants. This influence is studied through the introduction of interaction variables between the two types of risk and dividend payout determinants.

The researcher explores the theoretical links in the context of important dividend theories including life cycle, agency and transaction costs, residual and signalling theories. An empirical model is developed and used to examine testable hypotheses. The sample covers UK non-financial firms in the period from 1991 to 2014.This focuses on1340 firms including both listed and de-listed companies, with the aim of avoiding survivorship bias. The period of the study includes the 2008-2009 global financial crisis. Therefore, examining the impact of the resulting shocks to the supply of credit and demand, as well as firm risks, on the dividend payout ratios of firms, over this period of time, provides a further contribution to the literature on dividend policy in the UK.

The results robustly show that large-sized, more profitable firms have higher dividend payout ratios, in accordance with the transaction cost theory. In addition, the free cash flow hypothesis appears to dictate the dividend policy of UK firms. The abundance of free cash flow is likely to cause information asymmetry problems caused by overinvestment issues to escalate. In this instance, firms expel their excess cash flows rather than investing them in suboptimal projects that will increase unsystematic risk. In parallel, the small percentage of ownership by institutions and insiders is insufficient to substitute for dividends as a monitoring mechanism. Consequently, firms increase their payout ratios in line with the agency theory of dividends.

Despite the fact that free cash flows are scarce for young firms, it appears that UK firms do not follow the life cycle theory in setting their payout ratios. UK firms in all groups appear to increase their dividend payout ratios when their earned capital is low. The researcher argues that firms consider the factors that encourage dividend payments to be more important, so that they increase their payouts and rely on debt to finance their growth. In this respect, firms could be using dividends to signal their earnings potential. In addition, large-sized, profitable

firms such as utilities appear to accommodate their payout ratios and rely on debt to satisfy their growth needs. On the contrary, firms that belong to the technology sector preserve their cash flows by lowering their payout ratios to finance their investments, providing support to the residual theory of dividends.

The overall results show that UK firms that belong to industrial and technology sectors set their dividend payout ratios based on the flexibility hypothesis. This is evident from their reported dividend payout ratios being relatively low in spite of their high liquidity. On the contrary, firms classified as having high payout ratios, pay high dividends despite their low liquidity since they are capable of raising funds with low transaction costs.

The popularity of systematic risk as a determinant of the dividend payout ratio in the literature does not undermine the impact of unsystematic risk in setting the dividend policy of UK firms. The results significantly prove that firms lower their dividend payout ratios as their systematic and unsystematic risks increase. The coefficient of unsystematic risk, however, appears larger than that of systematic risk and significant across more groupings. In addition, the interaction effects between each of the systematic and unsystematic risks provide remarkable findings. The two types of risk appear to moderate the impact of profitability on the dividend payout ratio for the entire sample and for technology firms. Likewise, unsystematic risk moderates the impact of leverage and firm size for large-sized firms. On the other hand, systematic and unsystematic risks complement the impact of liquidity for the entire sample and for industrial firms, thus supporting the flexibility hypothesis and precautionary motives for holding cash. Similarly, the interaction terms between the two types of risk and the proxies of agency theory provide further support for the role of institutions and insiders in mitigating agency-related problems.

Finally, the global financial crisis does not appear to have a profound effect on the dividend payout ratios of UK firms. Large-sized firms, with excess free cash flows, such as utilities, are more susceptible to the demand shocks caused by the crisis. Therefore, they increase their dividend payouts to solve agency problems and signal stability in their financial condition. Conversely, the impact of the credit supply shock appears more relevant to large-sized and technology firms, which decrease their payout ratios as their financial leverage increases so as to preserve their cash as an alternative source of financing.

CHAPTER 1

INTRODUCTION

The "dividend puzzle" has motivated many researchers in finance to examine the extent to which dividend policy is influenced by corporate financial decisions and/or market decisions. Corporate dividend policy continues to pose one of the most puzzling and interesting topics of research. Indeed, dividend policy has been described as a "puzzle with pieces that just do not fit together" (Black, 1976) and "one of the ten important unsolved issues in corporate finance" (Brealey etal., 2006).

The puzzling aspects of dividend behaviour have actually and empirically evolved from the diverse interpretations provided by corporate managers as well as investors regarding the dividend payout policy. The diversity refers to the motives underlying the dividend payment decision that appear to vary across countries and firms. Proponents of dividends emphasize, in general, certain motives that encourage firms to pay out dividends. First, dividends serve as positive signals insofar as they reflect the company's earning power and its ability to generate healthy future cash flows (Bhattacharya, 1979, 1980; John and Williams, 1985; Miller and Rock, 1985). In this respect, profitability and cash flow are cited as major dividend policy drivers (Fama and French, 2001; DeAngelo et al., 2004). Second, the dividend payment is amethod by which managers dispose of excess cash flow, especially when companies run out of value-enhancing investment opportunities that require financing (Lloyd et al., 1985; Aivazian et al., 1999; Al-Malakawi, 2007). Third, dividends are paid by mature firms at later stages of their life cycle, as accumulated retained earnings increase, coupled with shrinkage in growth opportunities (DeAngelo et al., 2006; Denis and Osobov, 2008; Brockman and Unlu, 2011; Kuo et al., 2013). Finally, dividend policy has been cited as one of the costs borne by firms to minimize the negative consequences of the agency conflict, as it helps in aligning the goals of managers with those of stockholders (Rozeff, 1982; Easterbrook, 1984; Crutchley and Hansen, 1989; Jensen et al., 1992; Alli et al., 1993). Empirical studies provide mixed evidence as to why firms pay dividends and how their dividend policies adhere to various dividend theories. There is evidence that dividend policy bears a strong impact upon financing and investment decisions, and upon the agency conflict between managers and shareholders; yet this evidence remains controversial.

Another debate concerning dividend policy encompasses the relationship between dividend policy and firm risk. This relationship has been studied in the literature on dividend policy. A number of studies tackle the impact of firm risk on the dividend policies of firms (Pettit, 1977; Eades, 1982; D'Souza and Saxena, 1999; Blau and Fuller, 2008; Abor and Bopkin, 2010). However, the majority of studies focus on systematic risk and its impact on dividends, while they downplay the role of unsystematic risk in shaping firms' dividend policy.

The advent of the 2008-2009 global financial crisis appears to have had an adverse impact on financial and non-financial firms. The crisis is expected to have intensified the complexity of the dividend puzzle. Firm risks are expected to have escalated as a result of the increased levels of uncertainty caused by an abrupt shock to the supply of credit and the surge in the costs of external funding (Campello et al., 2010). Moreover, the crisis is anticipated to have resulted in demand shocks and a shift away from consumption towards savings (Mian and Sufi, 2010). Such shocks are likely to have caused shrinkage in the investment opportunities of firms. The extent to which companies suffered from agency-related problems, coupled with the availability of internal cash flows, are likely to have affected their dividend payout ratios during the crisis period.

1.1 Research Problem

Despite the vast amount of research conducted on dividend policy, gaps still exist from both theoretical and empirical perspectives. The dividend puzzle results from the existence of dividend policy in a real world that is multivariate and complicated (DeAngeloet al., 2008). Frankfurter and Wood (1997) note that "dividend-payment patterns"(i.e., dividend policy)are a phenomenon influenced by customs, regulations, public opinion, perceptions, general economic conditions, and several other factors. This implies that dividend policy cannot be "modelled mathematically and uniformly for all firms at all times" (ibid.).

This thesis will focus mainly on the determinants of dividend payout ratios in the UK and the impact of systematic and unsystematic risks on UK dividend payouts in the period of 1991-2014 that includes the burst of the technology bubble in 2001 and the global financial crisis of 2008-2009. It also addresses the extent to which UK dividend policy applies the theoretical notions of the life cycle, agency, residual and transaction cost theories, empirically. This research is primarily motivated by the following gaps that exist in the previous dividend literature.

First, there is relatively little research on the dividend policies of UK firms during the latest financial crisis in 2008-2009. The majority of the research covers the dividend policies of US companies during the crisis (Bliss et al., 2015). Despite the fact that the US and the UK are relatively similar in terms of governance, there is some variation in institutional settings such as regulation, tax rules and competition. For instance, there are differences between the US and UK governance systems related to the number of companies quoted in each stock exchange and differences in the categories of shareholders (Faccio and Lasfer, 2000). Therefore, testing an empirical hypothesis on the determinants of the dividend payout ratio in a more regulated market such as the UK, whose companies (similarly to those in the US) suffer from cash flow and liquidity problems caused by the financial crisis, could yield different results.

Second, the relationship between firm risk and dividend policy has primarily been confined to the impact of systematic risk on dividend payouts (Schooley and Barney, 1994; Al-Najjar and Belghitar, 2011; Aggarwal and Dow, 2012). This is based on the notion that investors, in the majority of cases, hold well-diversified portfolios, a fact that renders unsystematic risk an insignificant factor in terms of its influence on investors' decisions. Yet, to the best of the author's knowledge, the relationship between unsystematic risk and the dividend policies of UK firms is only addressed in the literature by Kuo et al. (2013), and no studies examine the impact of systematic and unsystematic risks on UK dividend payouts during the latest financial crisis.

Third, previous research in the UK context examines dividend policy theories independently. Some studies focus on examining the signalling role of dividends (Basiddiq and Hussainey, 2010; Fairchild, 2010). Other researchers study the impact of agency costs on dividend payouts (Khan, 2006; Renneboog and Trojanowski, 2011), or look at transaction cost theory (Al-Najjar and Hussainey, 2010). Nevertheless, the shareholder-manager conflict caused by information asymmetry problems could change across the life cycle of the firm, depending on the relative abundance of free cash flow (Jensen, 1986). At this stage, it is expected that firm risk could be different from that in earlier stages. Firm risks do affect the transaction costs of raising capital that also appear to be associated with profitability and firm size. In addition, firm risk could be a plausible reason for paying out dividends from a signalling perspective. This necessitates the analysis of dividend policy from a risk viewpoint, given that the interrelationships between the agency, life cycle, signalling, residual and transaction cost theories and the role of risk in linking those theories together have not been examined in a single model before now.

The gaps in the literature on dividend policy mentioned in this section give rise to the objectives of the study that follow in the next section.

1.2 Research Objectives

This research aims to examine the dividend policy of UK firms over a twenty-four year period: 1991-2014. Such a long duration of data necessitates the consideration of structural breaks, including the crash caused by the 2001 dot-com bubble. The researcher chooses the credit crisis of 2008-2009 as an experimental setting in which to study whether or not the renowned determinants of dividend policy still hold during a crisis period.

One of the main objectives of the study is to assess the relative influence of systematic and unsystematic risks on dividend payouts. The study emphasizes the impact of both risks on dividend payout ratios during the crisis. The results are contrasted for different industrial sectors, companies of different sizes, and different levels of dividend payout ratio.

Besides this, the researcher aims to study the adherence of UK firms to the various dividend policy theories, including the agency, life cycle, residual, transaction cost and signalling theories. The study will investigate the role of risk in explaining each of the above theories, and their impacts on the dividend policies of firms.

The research uses multivariate analysis, which is a panel data modelling approach used to explain the relationship between the variables and dividend policy. The dividend payout ratio is used as a proxy for dividend policy. The econometric method used in the study is the generalized method of moments (GMM), which has the advantage of curing the potential endogeneity problem characterizing panel data.

1.3 Contribution of the Study

This study makes a number of important contributions to the literature on dividend policy in the UK.

First, the study examines the dividend policy of UK firms in the period 1991-2014 by including both listed and dead companies, to overcome the issue of survivorship bias.

Second, this research covers dividend-paying companies, companies whose dividends are intermittent, and non-dividend-paying companies, since a zero dividend is counted as a policy followed by some of the firms.

Third, to the best of the researcher's knowledge, this study is among the few that examine the impact of unsystematic risk on dividend payouts in the UK. Also, comparing the relative importance of systematic and unsystematic risks to the dividend payout decision during the financial crisis of 2008-2009 represents a new addition to the literature.

Fourth, the study examines the impact of the financial crisis on UK dividend payouts. It investigates the applicability of various dividend theories to the dividend policies of firms during the crisis, to assess whether dividend payout ratios are more vulnerable to shocks to the supply of credit or demand caused by the crisis.

Fifth, in examining the validity of the various dividend policy determinants, the study tries to explain whether the nature of the sector to which a firm belongs has an impact on its dividend behaviour or not.

Sixth, the study contributes to the literature on dividend policy by bridging the link between firm risks and various theories of dividend policy. The role of risk in explaining the dividend theories of interest and their impact on the payout ratios of UK firms is examined.

A final contribution lies in considering the interaction between determinants of dividend payout ratios and both systematic and unsystematic risks. This helps assess whether risk moderates or complements the other determinants in setting dividend payout ratios in the UK.

1.4 Research Hypotheses

The gaps existing in the literature on dividend policy, at both theoretical and empirical levels, stem from the following points: First, there is limited and uncertain evidence pertaining to the role of both systematic and unsystematic risks in the setting of the dividend policies of UK firms. Second, there is a scarcity of research on dividend policy during the global financial crisis of 2008-2009. Third, there is diverse evidence on the applicability of dividend theory, mainly the life cycle, transaction cost and agency theories. All of the above prompt the need to further investigate those theories in the UK context. Therefore, the researcher develops and examines the main testable hypotheses that follow.

The first hypothesis relates to UK companies with high systematic and unsystematic risks having lower dividend payout ratios. The second concerns the extent to which firm risks affect dividend policy determinants, which would indicate the possible presence of interaction effects between those determinants and both systematic and unsystematic risks on the dividend payout ratio. The third testable hypothesis relates to the impacts of the two types of risk on payout ratios, which were higher during the financial crisis. Fourth, UK firms are hypothesized to adhere to the transaction cost theory, with large-sized, more profitable companies with abundant cash flows paying higher dividends. The fifth testable hypothesis is the applicability of the life cycle theory to the dividend policy of UK firms. In this instance, it is hypothesized that firms at early stages of their life cycle are small-sized, high-risk and have strong growth investment opportunities and limited earned capital. Hence, their early life cycle is characterized by low dividend payouts and vice versa. Sixth, there is an agency effect on dividend policy in which companies in the mature phase of their life cycle have low risks and excess operating cash flows that trigger agency problems. In this instance, we would expect firms to increase their payouts, following the free cash flow hypothesis. However, the existence of high ownership by institutional and insider investors is hypothesized to be negatively associated with dividend policy, as their presence is likely to alleviate agency-related problems.

1.5 Theoretical Framework

The impact of stock risk on dividend policy is interrelated with a number of dividend theories. Firm risks, being measured as the standard deviation of stock returns, are composed of two components: systematic and unsystematic. The two components have a generic nature of changing across the stages of a firm's life cycle. Therefore, the theoretical framework of this thesis focuses on examining the underpinnings of firm risks and dividend policies. This framework requires an elaboration of the effects of systematic risk, unsystematic risk, the growth of the firm (being considered a measure of size), information asymmetry, and profitability on dividend policy.

That is, early-growth firms, meaning those in the capital infusion stage, have ample investment opportunities and high cash flow risk that result in escalating levels of unsystematic risk. This stems from the fact that investors face greater uncertainty over whether such firms will benefit from those investment options or not (Cao et al., 2008; Hoberg and Prabhala, 2009). Therefore, firms are likely to pay out low dividends and direct cash flows towards financing their investment needs. On the contrary, mature firms have lower levels of risk that result from high profitability, sufficient cash flows and limited investment opportunities. Thus, they can support higher payout ratios (Venkatesh, 1986; Opler et al., 1999). Moreover, information asymmetry problems become more intense as firms move to the mature stage. In this phase, firms are characterized by low systematic risk coupled with excessive free cash flows that managers use to finance projects that investors believe could destroy the value of the firm. Consequently, firms are more likely to increase their payout ratios to disgorge excess cash flows so as to minimize agency problems. In this respect, it is expected that dividend payouts will be negatively associated with each of firm growth and firm risk, in line with the residual theory of dividends, and positively associated with free cash flow.

According to the transaction cost theory, large-sized, highly profitable firms are associated with low risk and low costs of external borrowing (Rozeff, 1982; Eades, 1982). Consequently, such firms can resort to external debt or equity financing, and can thus support high levels of dividend payouts. Therefore, profitability and firm size are expected to be positively associated with the dividend payout ratio.

Despite the fact that financial leverage leads to increases in firm risks, firms with high levels of debt could pay lower dividends due to the fact that loans intensify free cash flow problems that would in turn limit their dividend-paying capacity. Another view relates to the role of debt in minimizing information asymmetry problems since debt signals positive private information about quality (Ross, 1977) or a commitment mechanism (Grossman et al., 1982). In this respect, firms with high financial leverage could pay higher dividends as debt reduces entrenchment-related agency problems due to increased levels of monitoring by lenders.

The signalling role of dividends offers a plausible link between dividends and risk as well. That is, maintaining the current level of dividends or increasing it could be a sign of a company becoming less risky or likely to be more profitable in the future (Brav et al., 2005). On the other hand, high-risk firms avoid initiating or increasing current dividends to avoid the consequences of later having to reverse such decisions (Allen and Michaeley, 2003), in line with the signalling theory of dividends.

1.6 Structure of the Study

The remainder of the study is organized into five chapters:

Chapter 2: Literature Review

The second chapter presents a review of the relevant literature on dividend policy. The theories of dividend policy and empirical work associated with those theories are discussed. An overview of the Miller and Modigliani irrelevance theory of dividends, signalling theory, the tax theory and clientele theory is presented. A detailed explanation of the agency theory, the free cash flow hypothesis, the life cycle theory, and the transaction cost theory is followed by a review of the results of empirical studies based on those theories. The second section of this chapter discusses the relationship between firm risks, both systematic and unsystematic, and dividend policy, the measurement of systematic and unsystematic risk, and empirical evidence on firm risk and dividend policy. The third section deals with the major corporate determinants of cash dividend policy, detailing the empirical evidence, both supportive and adverse. The fourth section provides empirical evidence on studies of dividend policy in the UK.

Chapter 3: UK Dividend Practice

The third chapter presents an overview of the dividend practice in the UK and discusses the sections related to earnings distribution in the Companies Act of 2006. The second section of this chapter presents the changes in dividend taxation since the 1960s and the final section presents trends in UK dividend policy over the period of the study.

Chapter 4: Research Methodology

This chapter reviews the methodology employed in the study and is composed of nine sections. The first section presents the literature background and hypothesis development. The second and third sections discuss the data, sample selection criteria, and sample description.

The fourth section discusses panel data and econometric models for panel data. Section 5 includes a discussion of panel data model estimation covering the GMM. Sections 6 and 7 discuss panel data tests and multiple regression analysis respectively.

Chapter 5: Empirical Results

Chapter 5 presents the empirical results and discussion. The first section discusses the results of panel data tests, including linearity tests, normality tests, unit root tests and collinearity tests. The second section presents the descriptive statistics for the full sample of firms, and for firms grouped by level of dividend payout ratio, by firm size and by sector. The third section reports and discusses the empirical results for two models. Model (1) focuses on determinants of the dividend payout ratio and firm risk interaction variables. Model (2) covers determinants of the dividend payout ratio and the financial crisis interaction variables. The results of the two models are presented for the full sample of firms, and for firms grouped by level of dividend payout ratio, by firm size and by sector. In addition, the results of the impact of causes of de-listing on dividend payout ratio are also presented in section 3. The chapter concludes with a summary of the main findings.

Chapter 6: Summary and Conclusions

The final chapter discusses the main findings and conclusions of the study and ends with a presentation of recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

INTRODUCTION

The literature review presented in this chapter discusses both the theoretical background and empirical evidence pertaining to dividend policy theories as well as a review of the major dividend policy determinants. Since the advent of influential research on dividend policy such as Lintner (1956), and Miller and Modigliani (1961), a large number of theoretical models evolved in an attempt to solve the controversy as to the role of dividends and the dividend behaviour of firms. Frankfurter and Wood (1997), Allen and Michaely (2003), and DeAngelo et al. (2008) provide a review of the major theories of dividend policy over the previous four decades. The literature review discussed in section one of this chapter covers the theories that closely relate to the issues discussed in the thesis. The main theories of interest are the agency theory and free cash flow hypothesis, the life cycle theory of dividends. The study also sheds light on the signalling theory, transaction cost theory and the residual theory of dividends.

As far as dividend policy determinants are concerned, previous studies did not reach a consensus as to the major dividend policy drivers that remain part of the dividend puzzle. Among the dividend policy determinants, firm risk stands as a controversial issue. The relationship between firm risk and dividend policy has been discussed in the context of the signalling theory (Pettit, 1977) and life cycle. It is also still questionable whether a change in firm risk causes a shift in the dividend policy of firms or not. Researchers are mostly concerned with the role of systematic risk in shaping dividend policy, as they argue that unsystematic risk is mitigated by investors through diversification and thus it does not have an impact on dividends. However, a number of studies reveal that unsystematic risk plays a role in shaping the dividend policy of firms, since an increase in this type of risk is associated with extensive future growth that makes firms less likely to pay dividends (Hoberg and Prabhala, 2009; Kuo et al., 2013). This chapter also presents a discussion to the major determinants of dividend policy extensively studied in literature that are profitability and cash flow, financial leverage, firm size, corporate tax rate and industry.

The first section starts with an in depth analysis of the major theories of debate where the original theoretical models are introduced for each theory, followed by a critical presentation of the main arguments. Section 2.2 presents the main empirical evidence related to dividend policy theories. Sections 2.3 present a discussion of dividend policy determinants and their empirical evidence. Section 2.5 presents a review of the main studies and empirical evidence covering the dividend policy of UK firms.

2.1 Theories of Dividend Policy

2.1.1 Prime Research on Dividend Policy

Lintner (1956)

Lintner (1956) investigates dividend policy by interviewing managers selected from 28 companies. He reports a number of important facts that underlie the dividend payment decision of firms. First, firms have long term target payout ratios. Second, managers focus on a change in dividends rather than dividends in absolute terms. Third, dividend changes depend on long term sustainable levels of earnings. Fourth, managers are reluctant to make shifts in dividends that could be irreversible.

Based on the above results, Lintner (1956) built up a theoretical model for the explanation of the dividend behaviour of firms (**see Appendix 2-1**). According to this model, companies have a target payout ratio based on their levels of earnings. The change in dividends per share reflects the difference between target level of dividends and the actual dividends paid by the firm. In addition, the current level of dividends per share is a function of the company’s current earnings per share, lagged dividends per share, target payout ratio and speed of adjustment. This indicates that managers adjust to the target payout ratio through time or what is referred to as dividend smoothing.

The Lintner model has been subject to extensive investigation by researchers and profound results are presented. Allen and Michaely (2003) prove that the level of earnings is the strongest determinant of a change in dividends. Other studies show that managers maintain conservative dividend policies and thus their dividends are smoothed according to long-term sustainability of earnings (Brav et al., 2005). 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 confident about the future level of earnings. Subsequent research by Kalay (1980) proved that managers are reluctant to cut dividends once they decide to initiate dividends or lift dividend payout ratio. In addition, Allen et al. (2000) report that dividend payments attract institutional investors that are capable of detecting firms of high quality that maintain corporate governance .In this respect, dividends are important value drivers and any dividend cut may be detrimental to firm value as it could indicate the intention of reducing institutional ownership.

Miller and Modigliani Irrelevance Theory

Miller and Modigliani (1961) present the idea that dividend policy of the firm does not affect its value or owners' wealth and hence managers will not be able to utilize the dividend policy as a means of affecting the stock price. This irrelevance theory of dividends is based on the following assumptions:

1. **No taxes**; or the tax rate on cash dividends is equal to the tax rate on capital gain.
2. **No transaction costs**.
3. Investors are **rational and homogenous** in their decisions.
4. **No agency costs**. (Managers of low dividend-paying companies do not use the companies retained earnings to satisfy their personal goals.)
5. **Efficient capital markets** with no information asymmetries and stock prices are fully determined by information available in the market.
6. **No Information Asymmetry**, managers and investors have homogeneous information concerning the future prospects of firms.

According to this irrelevance proposition, dividend policy affects only the level of financing required for investing in future projects with positive net present value. In this respect, each dollar distributed in the form of dividends represents a capital loss of a dollar. This means that firm's value is a function of the investment policy which is responsible for future earnings, and not the dividend policy that it follows. Accordingly, managers should focus on investment policy and dividend policy should follow, a policy known as the "residual dividend policy".

Moreover, Miller and Modigliani (1961) present the idea of "homemade dividends" where investors create their own dividend policy by obtaining income through selling of shares equal to the value of cash they would have received in the form of dividends distributed by firms. In addition, investors could reinvest cash dividends distributed by the company if they do not have a need for cash. In this respect, investors will not be influenced by the dividend policy of firms. This idea is also supported by advocates of dividend irrelevance including Black and Scholes (1974), Miller and Scholes (1978, 1982).

Contrary to this view, Walter (1963) argues that dividend policy under the majority of circumstances affects the value of the firm. He develops a theoretical model based on the following assumptions:

1. **Internal financing**: All investments are internally financed through retained earnings (i.e., no debt or new equity raised).

2. **Constant return and cost of capital:** the firm's rate of return, r, and its cost of capital, k, are constant.

3. **100% dividend payout or retention:** Earnings are either fully retained or totally distributed as dividends.

4. **Infinite time:** the firm has infinite life.

According to Walter (1963), the market price per share is equal to an infinite stream of future dividend payments plus an infinite stream of returns from retained earnings. In this respect, dividend policy affects stock price in different directions. First, dividend payout ratio and price/share are negatively correlated when the rate of return is greater than the cost of capital.

Second, dividend payout ratio is irrelevant to price/share when the rate of return is equal to the cost of capital. Finally, dividend payout ratio is positively correlated to the stock price when the rate of return is lower than the cost of capital.

However, relaxing the assumptions under which Walter's model is based leads to different results concerning the relationship between dividend policy and shareholder value.

2.1.2 The Agency Theory and Free Cash Flow Hypothesis

Agency theory states that because common stockholders are dispersed and hold well-diversified portfolios, they delegate financial and other decision making to corporate managers. These stockholders care primarily about diversifying their risk, while managers have a tendency to pursue their own interests which might conflict with those of stockholders. This conflict gives rise to equity agency costs. According to Gordon (1962), an increased separation between ownership and management leads management to view corporate cash flows as belonging to the corporation and not to shareholders. Moreover, managers' investment decisions become less subject to supervision. Traditional corporate policy is developed under the assumption that the firm is one homogeneous unit formed with the objective of maximizing shareholders' wealth. However, under the agency theory, the firm is viewed as composed of groups with conflicting interests that cause them to seek the accomplishment of personal goals at the expense of maximizing the value of the firm.

A continuation to the above discussion is presented by the "free cash flow agency problem" of Jensen (1986). According to this hypothesis, managers of firms with substantial cash flows will tend to over-invest by accepting projects that might have negative NPV. This leads to a conflict of interest between managers and shareholders. The problem is how to motivate managers to expel the cash rather than investing it at below the cost of capital or wasting it on organization inefficiencies. In this instance, an increase in dividends (all other things held constant) is likely to decrease the suboptimal overinvestment and increase the value of the firm, while a decrease in dividends is likely to produce an opposite result. Similarly, Rozeff (1982) and Easterbrook (1984) refer to dividends as one of the primary tools used to minimise equity agency cost conflict by reducing the discretionary funds available to managers.

In line with the free cash flow hypothesis, other studies (Jensen et al., 1992; Alli et al., 1993; Schooley and Barney, 1994) suggest that dividend payment leads to a more frequent reliance of management on capital markets to raise funds thus increasing the discipline of managers, aligning their goals with those of stockholders and reducing the cost of monitoring them.

The role played by institutional investors to minimise the agency and free cash flow problems has been a subject of debate. Allen et al. (2000) posit that institutional investors not only favour dividend payment due to their tax advantage as discussed under the clientele theory but also dividends play a disciplinary role in monitoring managerial activities. Therefore, higher percentage of institutional ownership could provide better management monitoring, a reduction to agency costs with an aim of increasing firm value. Following the same line of thought, Zeckhauser and Pound (1990) argue that strong blockholders may exert pressure on management to take progressive dividend policies to improve monitoring.

An alternative view on institutional ownership holds that blockholders with strong voting positions have the advantage of monitoring managers' activity when compared to small shareholders. In this respect, the existence of outside blockholders constitutes a substitute for dividends as a device to reduce the agency costs. Consistent with this view, Warther (1993) argues that managers set their dividend policy to satisfy disperse investors with the aim of avoiding external interference in business operations. This scenario does not hold in case shareholders are large enough to exert strong monitoring power on firms' operations.

2.1.3 The Life Cycle Theory of Dividends

The life cycle theory of dividends finds its origin in the life cycle theory of the firm presented by Mueller (1972). In its initial stages, the firm invests all its limited initial resources funds in developing potential innovations and improving profitability. The firm then passes through a quick phase of growth undertaking risky ventures, expanding customer base and exploiting market potentials. Following this stage of growth, the firm passes through the "mature stage" in which the ability of firms to grow through innovation declines and cash flows generated from existing operations exceed profitable investment opportunities. At this phase, a value maximizing firm would begin to distribute its earnings to shareholders. Mueller (1972) associates dividend policy to the firm's life cycle, stating that "freedom to pursue growth, and the management-stockholder conflict that accompanies it, appear only over time as the firm expands and matures."

Jensen's (1986) free cash flow hypothesis presents a reasonable explanation to the dynamics of the life cycle theory of dividends. At earlier phases, the agency problem is non- existent or not significant, since managers are less likely to pursue their own interest at the expense of profitable investment opportunities. However, when the firm reaches the maturity stage, the agency problem evolves as a concern as free cash flow becomes abundant with limited investment opportunities a fact that raises concerns about managers misusing existing funds. At this stage, mature firms tend to initiate or increase dividends as a means of protecting shareholders' wealth.

Previous studies relating to the life-cycle theory of dividends (Fama and French, 2001; Grullon et al., 2002; DeAngelo et al., 2006) suggest that the dividend policy of firms represents a trade-off between a reduction in agency costs of free cash flow and the cost of dividend distribution represented in flotation cost due to dividends. This is explained by the fact that the cost of capital varies according to stage of the firm in its life cycle. Problems of information asymmetry are profound for newly listed companies and the cost of raising capital is high. As the firm becomes more mature, the information asymmetry is less severe in addition to a drop in the cost of capital. Therefore, a firm in its maturity stage faces increasing agency cost as well as lower cost of external capital, a fact that justifies paying high amounts of dividends.

The implications of the dividend residual theory are in line with the life cycle theory. Both theories state that management set investment as a priority and only distribute the remaining cash flows after investments are undertaken. DeAngelo et al. (2006) state that investment in positive NPV projects is the main prediction of Miller and Modigliani (1961). Thus, the obvious difference between the two theories in that the life cycle theory explains the behaviour of dividend policy across the life cycle of the firms, whereas the residual theory assumes that dividend policy changes in each of the stages of a firm's life cycle in line with the changes in investment opportunities.

2.1.4 Dividend Signalling Theory

As suggested by Lintner (1956), firms have long-term target payout ratios and dividend policy follows log run sustainable rather than short term changes in the level of earnings. This model implies that dividends act as a signal of past and future prospects of the firm. Under conditions of a perfect capital market presented by Miller and Modigliani (1961), all market participants have access to the same information about the firm; consequently, dividend payment does not have an effect on the value of the firm. However, information symmetry does not exist in real life and therefore, the market imperfection of asymmetric information provides the basis for the signalling theory of dividend policy.

Dividend Signalling Theory is based on the idea that in a world of asymmetric information, the more informed insiders (managers) use dividend policy as a means to convey information to the least informed outsiders (investors) about the firm's future profitability, earnings and growth. This implies that an increase (decrease) in dividends suggests an improvement (deterioration) in profitability and future prospects. If dividends are to be used as signals, a positive relationship should exist between dividend changes on one side and future earnings and/or share price reaction on the other side. This should result from dividend announcements providing the market with the missing content of current earnings which is then used by investors to predict the future expected earnings. The latter is then used to assess the current market value of the firm.

Modigliani and Miller (1961) are the first to introduce the hypothesis of "information content of dividends". They argue that when firms follow a stable dividend policy, any change in the dividend payout ratio is interpreted by investors as a change in management's perspective concerning the firm's future profitability. Similarly, Charest (1978) suggests that dividend payment does convey information about firms. However, the exact informational content included in dividend announcements still remains a controversial issue. In their theoretical models Bhattacharya (1979, 1980), John and Williams (1985) and Miller and Rock (1985) argue that managers who possess superior information about the current and future performance of the firm use dividends as a means of communicating this information to investors. Bhattacahrya (1979, 1980) argues that dividend decisions are made by managers (agents) with the objective of maximizing shareholder benefit because their own incentive (compensation) is tied to the same criterion. This is amplified by the fact that managers are the only ones who know the true cash flow distribution of their firms. Fairchild (2010) develops a theoretical model of dividends in which he argues that dividends play a dual role namely they signal the current performance or earnings of the firm and at the same time they affect the ability of the firm to invest in new projects. An increase in dividends maybe viewed as providing different signals – either an increase in current performance or earnings (thus reducing the information asymmetry problem) or a negative signal represented in the lack of growth opportunities. According to Ghosh and Woolridge (1991), firms do not like to decrease or eliminate dividends; hence, they make announcements of initiating or increasing dividends only when they are confident that they can maintain the current or an even higher level of performance.

2.1.5 Tax Theory and Clientele Effect Theory of Dividends

The tax effect theory is based on the assumption that if capital gain is untaxed or if the tax rate on dividends is higher than the tax rate on capital gain, investors would prefer companies that do not pay cash dividends but rather retain earnings for future growth prospects. In this respect, investors will require higher rates of return from the stocks of companies that distribute dividends to compensate them for the taxes they pay (Brennan 1970, Litzenberger and Ramaswamy 1979) and hence would pay higher prices for stocks with high capital gain versus companies that distribute large percentage of their earnings as dividends. Thus if companies retain earnings and these earnings are converted into capital gains, there would be a positive impact on shareholders' wealth.

The "Tax Effect Theory" led to the emergence of the "Clientele Theory" where each investor has his/her own preference for high or low cash dividends according to his/her own circumstances. Investors in low tax brackets who rely on regular and steady income are attracted to firms that pay high and stable dividends. On the contrary, some corporate or institutional investors tend to be attracted to high-dividend paying stocks (Short et al., 2002). Allen et al. (2000) argue that clienteles such as institutional investors are more attracted to invest in dividend-paying stocks due to their relative tax advantage over individual investors. In addition, institutions are often subject to restrictions in institutional charters that restrict them from investing in non-dividend or low-dividend paying stocks. According to Elton and Gruber (1970), investors in relatively high tax brackets might prefer companies that retain most of their income to obtain potential capital gains, all else being equal. Whereas other clienteles such as tax-exempt and tax-deferred entities are indifferent between dividends and capital gains. Allen et al. (2000) also argue that institutions are better capable of monitoring companies when compared to retail investors and hence this clientele effect justifies the presence of dividends.

2.1.6 The Residual Theory of Dividends

One of the implications of MM's (1961) dividend irrelevance model is that firms pay out as dividends all cash flows after financing all profitable investments. According to the residual theory of dividends, dividends are the remaining segment of earnings after corporations meet all investment requirements. In case the future profitable projects have not been fully financed with internally generated funds, corporations can cut their dividends to satisfy their investment needs. In this respect, dividend policy follows a flexible trend where firms pay variable dividends instead of having to regularly disgorge out regular amounts of funds in case internal funds are not sufficient.

This theory is linked to the pecking order hypothesis developed by Myers (1984), and Myers and Majluf (1984), upon which firms follow a specific financing scheme. Firms prefer internal finance to external finance and, within external financing, debt finance is favoured over equity due to transaction, information and monitoring costs. According to this hypothesis, external financing can reduce the value of the firm due to the high costs associated with new stock issues. Fama and French (2001) argue that profitable firms with low growth opportunities pay higher dividends as they are capable of avoiding the high costs associated with external financing in light of pecking order theory.

This theory further implies that mature companies are likely to pay higher amounts of dividends as a result of having excess cash given their low investment needs. Conversely, growth firms will pay low or no dividends because investments are their main priority. A vast body of empirical work proves that dividends are negatively associated with firms' growth options (e.g., Fama and French, 2001). However, other studies reveal that dividends are not volatile but they are smoothed over time and do not strictly follow annual changes in earnings. This is different from the findings of Lintner (1956) that firms set long-term payout ratios, pursue dividend Smoothing in this instance dividend policy does not follow a random walk. Similarly, in his research on payout policy, Brav et al. (2005) conduct a survey on 384 executives and report that managers view dividend decisions as important as investment decisions implying a rejection to the residual theory of dividends.

2.1.7 The Association between the Residual, Transaction cost and Agency Theories of Dividends

The link between the residual and the agency theory of dividends can be traced to the free cash flow hypothesis of Jensen (1986). He argues that excessive free cash flow may produce agency costs imposed on shareholders. This could result from the tendency of managers to use surplus funds without restraint and therefore could destroy the value of the firm. In this respect, firms should pay out all residual cash flow to prevent managers from overinvesting in non-value adding projects. Easterbrook (1984) suggests that consistent dividend policy increases the external reliance of firms on capital markets to raise funds making them subject to excessive monitoring. This implies that disgorging the free cash flow to investors in the form of dividends helps reduce agency costs and in turn adds value to firms. Moreover, the signalling hypothesis predicts that, under the residual theory, a payment of dividends can signal a lack of investment opportunities that could result in a negative abnormal return on announcement date.

The residual theory of dividends cannot be isolated from transaction cost theory and pecking order hypothesis. Firms pay dividends as a residual after satisfying all investment needs that are paid out of the internally generated funds, debt then new equity issues. Therefore, transaction cost theory predicts that larger more profitable firms are more capable of paying high amount of earnings as dividends, since they can raise external capital at lower transaction costs (Crutchley and Hansen, 1989). Rozeff (1982) argues that the optimal dividend policy is the one that minimises the sum of both agency costs and transaction costs. In this instance, fast growing firms can reduce their need for external capital by reducing their dividend payout ratios.

Dividend payment will reduce agency conflict however, will raise the need of firms to pursue external financing through external equity or bond markets, Therefore, firms will face increased transaction costs associated with external capital markets and/ or increased agency costs between bondholders and stockholders. In conclusion, a firm's optimal payout ratio is based on a trade-off between a reduction in agency costs associated with external equity and an increase in agency costs caused by external debt as the payout ratio increases (Bathala, 1995).

2.1.8 The Association between the Life Cycle and Agency Theories of Dividends

The life cycle theory of a firm posits that young firms at early stages of their life cycle face relatively large investment opportunities. However, those growth opportunities are not sufficiently profitable to satisfy their financing through internally generated funds. At this phase, firms have high systematic risk that their ability to raise capital from external sources is substantially confined (Mueller, 1972). Their free cash flows are limited compared to their investment opportunities. Therefore, firms would conserve their cash flows by foregoing dividend payments. In this respect, dividends are considered a residual to be considered only after satisfying a firm's investment needs as described by Modigliani and Miller (1961). As growth stabilizes and firms reach the stage of maturity in their life cycle, investment opportunities become scarce, systematic risk declines and firms generate cash internally greater than what they can profitably invest. The existence of excess cash flows is likely to cause agency problems to flourish. This result from the fact that shareholders become more concerned about the efficiency of utilizing available cash flows. For instance, they believe that managers could use the cash flows to satisfy some personal needs (Fairchild, 2010). Alternatively, managers could invest in projects deemed detrimental to the value of the firm raising an overinvestment problem. Consequently, firms are prone to use dividends as a tool to confiscate agency related problems that become more intense as firms advance in their life cycle. Eventually, mature firms will start to distribute earnings instead of internally retaining them. The distribution of dividends to shareholders rather than investing earnings internally is a function of extent to which the goals of managers are aligned with those of shareholders.

2.2 Empirical Evidence on Dividend Policy Theories

2.2.1 Agency Theory and Free Cash Flow Hypothesis- Empirical Evidence

Empirical evidence that analyses the relationship between institutional ownership and dividend policy reveals that institutional ownership either acts as a substitute for dividends or as a monitoring mechanism by expelling free cash flow to shareholders. The former view is proved by D'Souza and Saxena (1999) who test the effect of institutional ownership on dividend policy in a multinational framework. By using a cross-section of 349 companies for 1997 from Datastream, they report an inverse relationship between the percentage of institutional ownership and dividend payout ratio. Likewise, Jain (2007) studies the relationship between dividend yield and the percentage of blockholders on all dividend-paying US firms in the1989-1996 period. He provides evidence that institutional investors have greater likelihood to invest in low or non-dividend-paying stocks, while non-institutional investors prefer to hold dividend-paying stocks or high-dividend paying stocks. A cross-section of 349 firms worldwide from data stream for 1997.

Other studies prove that institutional blockholders play a monitoring role by exerting pressure on management to pay dividends. Grinstein and Michaely (2005) conduct a comprehensive study on institutional ownership and dividend policy between 1980 and 1996. They report that dividend-paying status is positively related to institutional ownership.

Correspondingly, the impact of institutional ownership on dividend smoothing is investigated by Javakhadze et al. (2014) from an international perspective in a sample covering 2000 non-financial firms worldwide in the period from 1999 to 2011. Goergen et al. (2005) investigate the reasons underlying dividend changes in Germany on a sample of 211 Industrial firms from 1984 to 1993 and report a negative relationship between the percentage of institutional ownership and the likelihood of a cut in dividends. This confirms the fact that dividend smoothing is negatively driven by the percentage of institutional ownership. The above findings indicate that institutional investors do not necessarily proxy for better governance and hence management either smooth dividends to provide investors with more predictable payouts or provide higher payouts to minimise agency problems.

Chazi et al.(2011) conduct a survey and interviews with CEOs of 33 companies listed on the Dubai and Abu Dhabi stock exchanges to better understand the determinants of dividend policy from an emerging market perspective. Their results confirm the fact that dividends are seen as minimizing agency conflict between management and stockholders. Almost 30% of executives report that influence of institutional investors is one of the major drivers of dividend policy especially in the UAE which is considered to be a bank oriented system. Moreover, almost 35% of executives report that dividends play a disciplinary role in companies, i.e., dividends play a role in monitoring management actions by stockholders.

Huang and Paul (2016) study the relationship between institutional holdings and dividend policy of US non-financial companies in the period 1981-2011. They jointly consider investment style and firms' growth opportunities and classify investors by growth and value styles based on Abarbanell et al. (2003)[1] and Bushee and Goodman (2007)[2]. They report that value style institutional investors favour low growth companies that pay high amount of

---

[1]Abarbanell, Bushee and Raedy (2003) develop a VALUE factor by computing four factors using 15 variables that represent the investment preference of institutions.

[2]Bushee and Goodman (2007) classify value style investors as investors in the top one-third of the VALUE factor while growth style investors are those in the bottom one- third of the VALUE factor.

dividends to total assets. Whereas growth style institutional investors, favour high growth firms with low levels of dividends to total assets.

Other studies show that the impact of institutional ownership on dividend policy is neutral such as Zeckhauser and Pound (1990) who study the relationship between the presence of large blockholders and financial policy on a sample of 286 US firms in 1988. They report that dividends are not a substitute of ownership as monitoring device due to the similarity between the level of dividends between firms with and without large percentage of blockholders.

The agency theory of dividends is also empirically examined by studying the impact of insider ownership on dividend policy. Rozeff (1982) studies the impact of insider ownership on the target dividend payout ratio of US non-financial and unregulated firms in the period 1974-1980. He reports that companies establish high payouts when insiders hold a low fraction of equity relative to outsider ownership. This finding supports the view that dividend policy is part of the monitoring/bonding package used to control agency problems. Similarly, Jensen (1992) study the impact of insider ownership on dividend payouts on a sample of 565 and 632 US companies in 1982 and 1987 respectively. He reports an inverse relationship between the percentage of stock held by insiders and dividend payout ratio. Similar results are reported by Eckbo and Verma (1994) who study the impact of insider investors on the actual dividends per share for 308 companies listed on Toronto stock exchange from 1976 to 1988. They report a decrease in dividends per share accompanied by an increase in the voting power of owners-managers.

Holder et al. (1998) find empirical evidence that supports the role of dividend policy in minimising the agency problem in a study conducted on 477 US firms in the period 1983-1990. They report a negative relationship between the standard deviation of dividend payout ratio and the percentage of stock held by insiders. Likewise, Chay and Suh (2009) find a negative relationship between insider ownership and each of dividend payout ratio and dividends- to –sales in four out of seven countries in the years from 1994-2005.

Florackis et al. (2015) study the impact of managerial ownership on dividend policy for all US companies listed on NASDAQ, NYSE and AMEX in the period 2001-2007 covering

7,376 firm-year observations. They report a negative relationship between the percentage of stock held by managers and directors and dividend policy as measured by the ratio of dividends to total assets at low levels of managerial ownership (below 10 percent). This supports the notion that dividends and ownership are substitutes. The negative relationship is reversed at higher levels of ownership since dividends are less likely to mitigate agency problems and managers tend to be more entrenched the fact that increases their propensity to pay dividends. This result supports earlier findings by Schooley and Barney (1994) for US firms and Farinha for UK firms (2003).

The free cash flow hypothesis is empirically proved by Holder et al. (1998). They study the impact of free cash flow on dividend policy for a sample of 477 U.S. firms in the 1983-1990 period and report a positive relationship between free cash flow and dividend payout ratio. Lang and Litzenberger (1989) investigate a sample of 429 U.S. companies that have announced a dividend change between 1979 and 1984 and separate them into two categories (using Tobin Q's as a means of categorizing and as an indicator of the expected profitability of future investment) as follows: First, value maximizing firms characterized by average Q ratio greater than unity (indicating that the average return in greater than the cost of capital) and second, overinvestment firms characterized by average Q ratio less than unity (the average rate of return is less than the cost of capital). Their results suggest that over investing firms witness higher abnormal returns subsequent to an increase in dividends when compared to value maximizing firms, a result consistent with the free cash flow hypothesis that dividend payment reduces the amount of substantial cash flow kept at the discretion of management.

Evidence from a number of countries confirms the free cash flow hypothesis. Mollah et al. (2000) study the dividend policy of 153 non-financial companies listed on the Dhaka stock exchange for the period from 1988-1997. His results prove that managers use excess free cash flow to pay dividend or retire debt as a means of reducing agency costs. Similarly, Thanatawee (2011) conducts a study on 256 Thai companies in the 2002-2008 period and reports a positive relationship between free cash flow and both dividend payout ratio and dividend yield. Similarly, Firth et al. (2016) conduct a study on the impact of institutional ownership on cash dividend policy in China in the period 2003 through 2011. Their results prove that institutional investors in particular mutual funds force companies to increase their dividends especially for firms that generate excess free cash flows.

Conclusion

Corporate dividends reduce agency costs due to either an increase in external monitoring or a reduction in the extra cash flows kept at the discretion of managers that could be wasted on private interests (Gordon, 1962). Through the payment of dividends, firms are obliged to raise external funds to finance new investments. This in turn increases the level of external monitoring exerted on corporate activities (Rozeff, 1982; Easterbrook, 1984). According to Jensen's (1986) Free Cash Flow Hypothesis, free cash flows paid to shareholders through dividends reduce the chance of managers being involved in suboptimal investment activities.

The free cash flow agency view is supported by a number of empirical studies including Eckbo and Verma (1994), Goergen et al. (2005),and Holder et al. (1998), who prove that institutional blockholders force managers to expel the free cash flow in the form of dividends to minimise agency costs.

Another view of the agency effect on dividend policy is the tendency of institutional investors to monitor the activities of firms. This results from the fact that institutional blockholders have strong voting positions or board representations thus they have an advantage of monitoring managers' activity compared to small shareholders. Therefore, the existence of outside blockholders constitutes a substitute for dividends as a device to reduce the agency costs. Empirical evidence on the role of institutional investors as dividend substitutes is supported by a number of studies that prove the presence of large blockholders of institutional investors to lower the amount of dividends paid (D'Souza and Saxena, 1999; Khan, 2006; Renneboog and Trojanowski, 2011).

2.2.2 The Life Cycle Theory of dividends- Empirical Evidence

Supportive Evidence

The empirical evidence presented by Grullon et al. (2002) shows that subsequent to an increase in dividends, there is a decline in the systematic risk of firms and vice versa. This result sheds light on the discrepancy between mature and high-growth firms that is also evident from the appreciation of stock prices after an increase in dividends meaning that the investors categorize firms that increase dividends as low-systematic risk firms. Fama and French (2001) investigate the decline in the propensity of US firms to pay dividends. By contrasting the investment opportunities for dividend and non-dividend-paying firms in the United States in the 1963-1999 period. They find that the decrease in the proportion of dividend payers results from the increasing number of small-sized, low profitable firms with strong growth opportunities. They also report that firms that never paid dividends have the highest growth opportunities with a 16.5% average annual growth rate of total assets versus 8.78% for dividend payers. Although they argue that the propensity to pay dividends is still on the decline even after controlling for these firm characteristics, their study still provides some support to the life cycle theory of dividends. Similar results are reported by Bildiq et al. (2015) in a study that compares the dividend payout behaviour of firms in the US and 32 other countries in the period 1985-2011. Their findings indicate that large-sized profitable firms with fewer growth opportunities have higher propensity to pay dividends in all markets.

DeAngelo et al. (2006) use earned/contributed capital as a test for the life cycle theory of dividends and assess whether the probability of a firm paying dividends is positively related to its level of earned/contributed capital. They measure earned/contributed capital that account for firm maturity using two proxies which are retained earnings as a ratio of total assets (RE/TA) and retained earnings as a ratio of total equity (RE/TE). Firms with low RE/TE and low RE/TA tend to be in what they refer to as the “capital infusion stage”, while firms with high R/E/TE tend to be more mature with more cumulative profits that make them good candidates for dividend payment. They find that the propensity of paying dividends is influenced significantly by the earned capital to total capital after controlling for cash flow and dividend history. Replicating the variables used by DeAngelo et al. (2006), Hauser (2013) report that dividend payment increases with an increase in the amount of contributed capital as measured by retained earnings to total equity for U.S. industrial companies during the period of financial crisis (2008-2009).Denis and Osobov (2008) conduct a study on the life cycle theory of dividends in six countries: United States, United Kingdom, Japan, Canada, Germany, and France. They also use earned/contributed capital as a measure of a firm’s maturity and measure contributed capital as the ratio of retained earnings to book equity. They report that firms that pay dividends in Canada, the United Kingdom, and the United States are shown to have minimal growth opportunities, while in France, Germany, and Japan, growth opportunities provide mixed results. The majority of results confirm the life cycle theory of dividends in which the maturity of firms and the distribution of free cash flow is one of the major determinants of dividend policy. Aggarwal and Dow (2012) conduct a study of Japanese firms covering the periods of 1990-1991, 1996-1997, and 2001-2002. They find a positive relationship between earned/contributed capital measured as the ratio of retained earnings to common equity and both of dividend growth rates and dividend payout ratio. Thanatawee (2011) confirms the life cycle theory of dividends in Taiwan and finds that earned/contributed capital as measured by retained earnings to total assets is positively correlated with dividend yield and dividend payout ratio. Likewise, Kuo et al. (2013) test the impact of contributed capital on dividend payouts in the US, UK, Canada, Germany, Hong Kong, Singapore, France, Australia and other European countries from 1989 to 2011. They show a positive link between contributed capital and the propensity to pay dividends in all nine markets.

Banyi and Kahl (2014) examine the declining propensity to pay dividends in light of the life cycle theory of dividends. The sample of study includes US industrial firms from 1973 to 2011 covering 15,291 total number of firms. Consistent with DeAngelo et al. (2006), the study reports a positive relationship between earned capital ratio as measured by retained earnings to total assets and the propensity to pay dividends. However, the strength of the relationship between earned capital and dividends declines due to the influx of new IPO firms that are less profitable, riskier and less likely to pay dividends. Conversely, the relationship between earned capital and dividend policy is constant for aged more mature firms that went public at earlier dates indicating that the impact of earned capital on dividend policy is more profound as firms mature. Global evidence proves that high amount of retained earnings is associated with higher propensity of dividend payment in a study covering 80,725 firm-year observations from 31 countries for the period 1996-2007 (Brockman and Unlu, 2011).

Prior evidence is supported by Rapp et al. (2014), who study the impact of earned capital on the propensity to pay dividends, dividend increases and dividend omissions. The sample covers U.S. non-financial companies listed on the NASDAQ, AMEX and NYSE between 1999 and 2010. They report a positive association between earned capital as measured by the ratio of retained earnings to total assets and each of dividend increase and the propensity to pay dividends and a negative relationship between earned capital and dividend omission proving that the accumulation of retained earnings is associated with lower growth opportunities that encourage companies to expel out the cash flow in the form of dividends.

Fairchild et al. (2014) also prove that the current change in earned capital ratio (retained earnings to total assets) is negatively associated with dividend changes, while the lagged change in earned capital shows a positive and significant association with dividend changes thus showing support to the life cycle theory of dividends in Taiwan.

Other studies use measures of investment opportunities to assess the adherence of dividends to the life cycle theory. Lloyd et al. (1985) study the relationship between investment opportunities of 958 US non-financial and unregulated firms. Average five-year growth in sales is hypothesised to measure the need for investment funds. They report that firms with strong investment needs pay lower amounts of dividends. Similar results are accomplished by Aivazian et al. (1999), Al-Malakawi (2007), Lee et al. (2011) and Alzahrani and Lasfer (2012). They use sales growth and MB ratio as measurements of firms' investment needs, and they all confirm that dividend and investment decisions are not independent but they are rather negatively correlated. Fargher and Weigand (2009) investigate the impact of dividend initiation on the dividend policy of U.S. firms in the 1965-2000 periods including all firms that pay quarterly dividends for a minimum of two consecutive years. They report that firms use dividends to expel excess cash flows consistent with the agency theory. Moreover, low MB firms experience the higher price reaction to dividend initiation as compared to high

MB firms. However, the latter experience a build-up of cash and a decline in capital expenditure within three years of dividend initiation. This indicates that high-growth firms start paying dividends as they witness a transition from growth to maturity phase in conformance with the life cycle hypothesis.

Fama and French (2001) study the investment opportunities for dividend and non-dividend-paying firms for non-financial and non-utility NYSE, AMEX and NASDAQ companies in the 1963-1999 period. Based on the hypothesis that non-dividend payers are high-growth firms with large investment opportunities, they use three proxies of investment opportunities which are percentage change in total assets, R and D/Total Assets and the ratio of aggregate market value of total assets to aggregate book value of assets. They conclude that firms that never paid dividends have the highest growth opportunities with a 16.5% average annual growth rate of total assets versus 8.78% for dividend payers. Moreover, the ratio of aggregate market value to aggregate book value of assets is 1.64 for non-payers versus 1.39 for payers and 1.1 for former dividend payers.

Other studies show that the global phenomena of declining dividends could be explained by the strong growth opportunities that tighten the dividend-paying capacity of firms. Hoberg and Prabhala (2009) study the impact of a change in firm growth as measured by MB on the propensity to pay dividends for US firms in the 1964-2004 period. They report that larger profitable firms with low MB ratios pay lower dividends. Likewise, the adherence of Canadian dividend policy to the transaction cost theory is supported by Baker et al. (2013), who conduct a study on all Canadian companies listed on Toronto Stock Exchange between 1998 and 2006 and prove that larger, more profitable firms with fewer growth opportunities (as measured by the ratio of market to book) have higher dividend payouts.

Bliss et al. (2015) investigate the impact of growth opportunities on dividend payouts during the 2008-2009 financial crisis. They prove that firms resort to dividend payout reductions as a substitute channel of financing due to the shock to the supply of credit.

Opponent View

D'Souza and Saxena (1999) investigate the relationship between investment opportunities and dividend payout using a sample of 349 firms worldwide. They measure investment opportunities using sales growth and MB ratio and report the fact that dividends are paid irrespective of the investment opportunities of firms. Other empirical studies show that firms with ample growth opportunities pay higher amounts of dividends. Similar results are reported by Aggarwal and Dow (2012) and Kuo et al. (2013), who found that strong growth opportunities have a positive impact on the propensity to pay dividends, while low growth opportunities are associated with low dividend payment.

Conclusion

In light of life cycle theory, changes in dividends reflect the change in growth opportunity and free cash flows. At early stages of a firm's life cycle, investment opportunities are ample, retained earnings are limited and hence firms prefer to invest their free cash flows rather than distribute dividends. When firms reach mature stages of life cycle, they tend to be highly profitable, have excess cash flows, while growth opportunities diminish. That makes them good candidates for dividend payment. According to Fama and French (2001), Grullon et al. (2002), and DeAngelo et al. (2006), dividend policy reflects a trade-off between the benefit of reducing agency costs of free cash flow and the transaction costs resulting from raising new equity due to dividends. Overall, the majority of empirical evidence proves that mature firms with high balances of retained earnings and small investment opportunities tend to pay high amounts of dividends.

2.2.3 Dividend Signalling- Empirical Evidence

The use of dividends as signals to convey information to investors in the marketplace has been extensively examined by researchers. Pettit (1972) investigates the impact of dividend announcements on the price per share using a sample of 625 NYSE firms in the period 1964-1968. The findings prove that the market reacts in (terms of price changes) with strong magnitude when dividend announcements include a substantial reduction or increase in the amount of dividends paid. Likewise, Aharony and Swary (1980) study the impact of a change in dividends per share on cumulative stock return on a sample of 149 NYSE companies with in the period 1963-1976. Their results prove that abnormal stock returns for companies that cut their dividends are more profound than abnormal returns for companies with a dividend increase. This implies that dividends act as strong signals in case of companies that announce dividend cuts. Healey and Palepu (1988) examine the dividend signalling theory on a cross section of 131 NYSE and AMEX companies that initiate dividends in the period (1954-1963) and 132 firms that omitted dividends in the period 1969-1980. This study shows a significant relationship between the initiation of dividends and subsequent changes in earnings. In other words, investors interpret dividend initiation and omission announcements as forecasts by managers of a company's future earning changes.

Other studies prove that companies rely on dividends as a signalling tool by studying the impact of a change in dividends per share on the stock price and revision of earnings forecast (Yoon and Starks, 1995). By studying a sample of 3748 dividend increase announcements and 431 dividend decrease announcements for a cross section of companies listed on NYSE for the period 1968-1988, they find a revision in analysts' forecasts following an increase or a cut in dividends in light with the signalling hypothesis. Hanlon et al. (2006) investigates whether US firms use dividends as signalling mechanisms by examining 88,312 firm year observations for non-financial companies in the period 1970-2004. Their results prove that dividend paying companies have significantly higher current annual stock returns when compared to non-dividend paying firms. Similarly, high dividend payers have higher stock returns than low dividend payers in addition to firms witnessing higher stock returns following the initiation of dividends. These findings support the information content of dividends in which they provide the market with information about future earnings beyond the information provided by current earnings.

On the other hand, De Angelo et al. (2006) study the impact of a change in dividends on abnormal stock returns and a change in future earnings on a sample of 145 NYSE companies whose annual earnings decreased after nine years of consecutive growth. The results of the study prove that signals provided by dividends are not reliable in predicting future earnings of firms thus providing no support to the signalling role of dividends. Likewise, Chen et al. (2002) prove that cash dividends do not have a significant impact on stock returns in China indicating the dividends appear to have no signalling role in the Chinese stock market in the period 1994-1997.

Vieira and Raposo (2007) examine 380 dividend events for non-financial Portuguese firms, in the period 1989-2002, 356 dividend announcements for French firms in the period 1994-2002 and 3278 dividend events for companies listed in LSE. Their findings prove that dividends and stock prices are negatively related for a lot of dividend events in France and Portugal. This indicates that countries where firms have more concentrated ownership do not need to use dividends as signals.

2.2.4 Tax and Clientele Theory-Empirical Evidence

The tax clientele theory of dividends has been a subject of extensive research. Pettit (1977) studies the impact of differential tax treatment on dividend yield for 914 NYSE investment portfolios between 1964 and 1970. Their evidence suggests that the differential tax rate co-efficient is consistent with the hypothesis that taxes cause investors to select stocks with a combination of dividends and capital gain to minimize the tax effect. Similar results are reported by Litzenberger and Ramaswamy (1979) in a study conducted on all NYSE firms in the period 1963-1977. They report that investors in higher tax brackets choose stocks with lower dividend yield and vice versa. Likewise, Desai and Jin (2011) study the impact of institutional tax clientele on payout policy in the US. The sample includes companies where institutional investors own a minimum of 10% of the outstanding shares of common stock. By classifying investors into dividend averse and non-dividends averse, they report that firms owned by dividend- adverse institutions tend to have lower payouts. In addition, any change in the tax costs of institutional shareholders leads to subsequent changes in dividend policy.

Wu (1996) examines the impact of changes in personal tax regimes on corporate dividend policy using SandP 500 and SandP 400 relying on Compustat quarterly earnings and dividend data from 1965 through 1996. He studies the change in dividend payout using (D/P) and (D/E) as proxies for dividend payout. Results indicate an increase in dividend payout as measured by (D/P) in 1978, 1986, and early 1987 and an increase in dividend payout as measured by (D/E) starting in 1986 and onward. These results followed the revenue act in 1978 and tax reform act of 1986. The United States Revenue Act of 1978 led to a reduction in the corporate tax rate and a change in shelter tax rules. In 1981, top individual tax rates decreased from 70% to 50%.Moreover, the tax reform act of 1986 eliminated the preferential tax treatment for capital gain.

On the other side are studies that refute the tax clientele theory of dividends. Survey results by Brav et al. (2005) provide weak evidence for the tax effect in setting dividend policy. By surveying 384 US executives and 23 one-to-one interviews, they conclude that the tax disadvantage of dividends is a second order priority in setting the dividend policy. Black and Scholes (1974) test the tax clientele theory by creating 25 portfolios of stocks listed on NYSE over a thirty-five-year period from 1931-1966. They chose stocks that vary widely in terms of dividend yield and ß then classified them into groups depending on their risk class. They conclude that expected return on high dividend yield stocks is not different from expected return on low yield stocks before or after taxes. In addition, returns on stocks with low dividend payout do not differ from returns on stocks with high dividend payout the fact that yield the tax clientele theory of dividends irrelevant. Similarly, Miller and Scholes (1982) use company data from 1940 through 1978 and exclude companies that announce and distribute their earnings in the same month in order to alleviate the impact of dividend declaration. Their findings indicate that the tax differential between dividends and capital gain is 4% and not 23% and in terms of statistical significance is close to zero. This indicates that there is no change in value caused by the difference in tax rate between cash dividends and capital gain. In conclusion, they prove a direct relationship between the total portfolio returns and cash dividends, a relationship that reflects a share price increase not due to a negative impact of taxes but rather due to an unexpected increase in cash dividends.

2.2.5 Residual Theory- Empirical Evidence

Alli et al. (1993) test the dividend policy of 105 U.S. companies in the period from 1985-1987. They investigate whether companies follow the residual policy of dividends or not by examining the relationship between dividend payout and each of issuance cost, capital expenditure and capital structure flexibility. The study reports a significant negative relationship between payout ratio and issuance cost. This indicates that companies that suffer from high issuance costs have high growth and a high expected level of capital expenditure. Consequently, they pay low amounts of dividends. Moreover, companies with flexibility of capital structure have higher amount of dividend payout. This supports the residual dividend theory because of the greater availability of surplus funds resulting from the flexibility of the financial structure.

Brav et al. (2005) conduct a survey to identify factors that monitor dividends and repurchases decisions in the United State. The study reports that companies tend to increase dividends after covering all investment and liquidity requirements consistent with the residual dividend policy. Similarly, Baker and Smith (2006) survey 309 companies to assess the applicability of the residual policy in the 1990s. The results show that companies set their dividends according to the pure residual policy, managed dividend policy or modified residual policy that represents a merge of the above two methods. The study also proves that companies that follow the residual policy of dividends have a standardized free cash flow of zero or close to zero. On the contrary, D'souza and Saxena (1999) study the residual theory of dividends on a sample of 349 companies worldwide in the period 1995-1997. Their results indicate that dividend payout ratio and investment opportunities are rather independent thus negating that the sample of firms understudy follows the residual theory of dividends.

2.3 Dividend Policy Determinants

Introduction

Dividend policy has been a subject to debate by researchers for a long time. Theoreticians and researchers have studied the factors that managers should take into consideration when setting their dividend policy (the payout pattern and the size of cash payout they intend to provide to shareholders). The motives underlying the dividend decision of firms is explained by a number of theories discussed in Section 2.1. Nevertheless, the theories require examining a number of corporate factors that managers consider when setting their dividend policy. Those factors refer to various accounting variables that are thought to affect the decision of whether to pay dividends or not, the amount of dividends paid by firms, as well as the decision of a change in dividends – whether an increase, a decrease, or a dividend omission.

This section starts with an explanation of firm risk, both systematic and unsystematic, as one of the factors that seem to influence the dividend-paying behaviour of firms. Subsequently, provides an explanation to the set of variables widely cited in the literature of dividends as major corporate determinants of dividend policy. Those factors include corporate earnings and cash flow, financial leverage, firm size, corporate taxes in addition to the industry to which the firm belongs to.

2.3.1 Dividend Policy and Firm Risk (Systematic and Unsystematic Risks)

Introduction

The risk and return trade-off has been extensively studied in financial literature and the extent to which the stock return is affected by systematic components, unsystematic factors or the combination of the two is still subject to research.

According to Sharpe (1964) and Lintner's (1965) famous capital asset pricing model (CAPM), the rate of return on a portfolio is affected by two components of risk (where overall risk means the variation in portfolio return). These two components of risk are the systematic and unsystematic or unsystematic risk. Systematic risk is defined as the co-variation of portfolio rate of return with market rate of return, and according to Sharpe, systematic risk is perfectly correlated with the market portfolio, which is composed of all outstanding securities

Unsystematic risk represents the stock's variance that is not attributable to overall market volatility, but is rather related to the firm's specific volatility. Unsystematic risk is unique to a stock because it is related to the part of a stock's return that does not vary with returns on other stocks or the market. In other words, total stock variance $\sigma_I^2 = ß_I^2 \sigma_m^2 + \sigma_{\varepsilon i}^2$ can be broken down into two terms. The first term, $ß_i$, is the firm's systematic risk component, which represents the part of a stock's variance that is attributable to overall market volatility.

The second term, $\sigma_{\varepsilon i,}$ is the firm's unsystematic risk component, which represents the part of a stock's variance that is not attributable to overall market volatility. The unsystematic risk component is related to the firm's specific volatility (Bali, 2003).

As the number of the stocks in a portfolio increases, unsystematic risk becomes less important because the effects of unsystematic risk of the various stocks in the portfolio will cancel each other. Thus, in a well-diversified portfolio, unsystematic or unsystematic risk contributes nearly nothing to the total portfolio risk. However, the impact of unsystematic risk cannot be ignored in case of investors holding undiversified portfolios.

An extensive research in the literature of dividend policy has been dedicated to assess the impact and relationship between dividend policy and firm risk. Firm risk has been measured using a number of proxies including stock return volatility, systematic risk (ß) and changes in the firm cost of capital. Price reactions following dividend increases or decreases suggest that these changes are interpreted by investors as positive or negative news. The news could be related to sustainability or change in future earnings or cash flows. If the positive or negative news is not about changes in future cash flows, then it could be related to changes in the firm’s discount rate and systematic risk.

The relationship between discount rates and dividend policy could be interpreted in terms of the “bird in the hand” theory in which investors value a dollar of cash dividends higher than a dollar of an uncertain capital gain. Investors evaluate share prices through a predictable cash flow per share and then discount it at a rate reflecting its risk. This discount rate is positively correlated with risk; therefore, the discount rate which is used to determine the price of a stock with future capital gains will be greater than the discount rate used to determine the price of a stock currently paying cash dividends, since the latter is considered less risky than the non-dividend paying stock. As a result, high dividend-paying companies should have higher stock prices than low dividend-paying stocks. Ang and Liu (2007) develop a theoretical model that explains the relationship between stock volatility, expected returns and price-dividend ratios. Based on the nature of the risk-return trade off, they argue that stock return in a sum of price dividend ratio plus dividend yield. Thus, stock return is a function of price-dividend ratio and dividend growth rate. Therefore, expected returns can be predicted using the price–dividend ratio, together with dividend growth rates. Going the other way, given dividends, the return volatility also determines price–dividend ratios and vice versa. They also prove that knowing dividends and price–dividend ratios, stock volatility can be calculated.

Empirical Evidence

Introduction

Early empirical research focuses on the role of risk in shaping the dividend policy of firms in the context of signalling (Pettit, 1977; Eades, 1982; Lloyd et al., 1985). An alternative view is the tendency of firms to distaste dividends when they evidence a downturn in earnings that is being translated into higher levels of risk (Chang and Rhee, 1990; Schooley and Barney, 1994). Increased levels of risk are also likely to create cash flow shortages thus tightening the dividend-paying capacity of firms (Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004). Empirical work by Rozeff (1982), Lloyd et al. (1985), and Grullon et al. (2002) proves that a decrease in dividend payout is associated with an increase in systematic risk. They argue that the rise is systematic risk is caused by a decline in profitability and/ or an increase in financial leverage. Likewise, Chang and Rhee (1990) show that low-risk firms have more stable earnings and thus can pay higher dividends, while the negative association between systematic risk and dividend policy is driven by a downturn in earnings and cash flows (Schooley and Barney, 1994).

A parallel explanation to the relationship between firm risk and dividend policy is introduced by Lee et al. (2011). They develop a theoretical model of dividend payout and argue that the optimal dividend payout ratio is negatively (positively) associated with total risk when the growth rate of the firm is higher (lower) than the rate of return on assets. This indicates that high-growth firms pay dividends due to flexibility considerations whereas low growth firms pay dividends to avoid agency costs associated with excessive free cash flow.

The marginal relationship between unsystematic risk and dividend policy is further investigated by Hoberg and Prabhala (2009); Blau and Fuller (2008) and Kuo et al. (2013).

They report that an escalation of unsystematic risk is associated with a decline in the propensity to pay dividends.

Supportive Evidence

The relationship between dividend policy and systematic risk has been subject to extensive investigation by researchers over the previous forty years. Brav et al. (2005) survey and interview 384 financial executives to determine why they pay dividends. Results of this survey provide some predictable reasons for paying dividends including avoidance of negative consequences, common stock valuation, and making the firm less risky. Despite the fact that executives provide no quantifiable reason as to how dividends reduce risk, they still cite risk reduction as one of the main reasons for paying dividends. Their results shed light on the concept of managerial conservatism that means that managers of dividend-paying firms are reluctant to cut dividends and non-payers are reluctant to initiate dividends. Dong et al. (2005) study the reasons underlying the demand for dividends by individual investors in the Netherlands. By submitting a questionnaire to a Dutch investor panel comprised of 2,723 investors, they report that it is the change in dividends (i.e., an increase or a decrease in dividends) and not dividend yield that signal the future cash flow prospects. This indicates that investors think that a company that has high current dividend yield is a high-risk company since high dividend payment represents a drain to its current cash resources. On the contrary, they attribute the decision of the company to increase its dividends to a decrease in risk and as a positive signal for future profitability.

Early empirical work explains the role of systematic risk in shaping the dividend policy of firms in light of the signalling theory. Pettit (1977) analyses 914 portfolios on NYSE over a seven-year period from 1965 through 1971. He argues that a change in risk is a main reason for the difference between actual and expected levels of earnings, a fact that justifies the existence of a relationship between dividends and securities' prices and reports a negative relationship between systematic risk and dividend yield.

Rozeff (1982) studies the relationship between dividend payout and systematic risk (ß) on a sample of 1,000 U.S. non-financial and unregulated firms over the period from 1974-1980. Using dividend payout ratio as a dependent variable he finds that dividend payout ratio is a negative function of systematic risk. He explains this relationship by assuming that systematic risk as measured by ß incorporates both operating and financial leverage. Thus the higher the ß of the firm, the more costly the external financing is. Therefore, firms with high level of systematic risk tend to have lower dividend payout ratios to minimise the cost of external financing. Eades (1982) studies the relationship between systematic risk and dividend yield on 3258 companies divided into five sample periods from 1960-1979. This study confirms the negative relationship between ß and dividend yield for all sample periods. He argues that this relationship confirms the fact that dividend changes act as signals for changes in firm's risk and these signals are more powerful for low-risk companies than for high-risk ones. Lloyd et al. (1985) replicate the study of Rozeff (1982) using a sample of 957 U.S. non-financial firms and more updated financial data and report the same results. D'Souza and Saxena (1999) use systematic risk as an independent variable and examine the relationship between dividend policy and systematic risk by studying the impact of systematic risk on dividend payout ratio on a cross-section of 349 firms worldwide from for the year 1997.They prove that firms that have high risks relative to the market pay lower amounts of dividends. Grullon et al. (2002) examine the dividend changes, changes in systematic risk and profitability, and their impact on price reactions. The study analyses 6,284 dividend increase announcements and 1,358 dividend decrease announcements for US firms between 1967 and 1993. Dividend increasing firms witness a decrease in systematic risk as measured by a 1% decline in risk premium (Δß multiplied by risk premium) whereas the systematic risk of dividend decreasing firms increased as their risk premium increased by 2%. They also report an improvement in the bond ratings, a surge in period abnormal returns as well as a long term drift in prices following an increase in dividends. This indicates that the initial price reaction is associated with a decline in risk whereas any future decrease in profitability or increase in risk is associated with a long-run change in stock prices.

Allen and Michaely (2003) summarize the impact of firm risk on dividend policy in light of the signalling theory. They prove that dividend initiations have positive announcement effects of around 3%, while dividend omissions have announcement effects close to -7%. Similarly, dividend increases have average announcement effects of around 1%, while dividend decreases have announcement effects of almost -3%. This can be interpreted as either a cause for why firms avoid dividend cuts or as a consequence of expectations from rational investors when firms are known to be reluctant to cutting dividends. In either case, these results imply that the penalty for reversing an upward dividend change means that high-risk firms are averse to initiate or increase dividends since they are keener to avoid reversing a prior decision of a dividend increase or initiation.

An escalation in firm risk is hypothesised to be associated with a downturn in earnings and cash flow that justify a cut in dividends. Schooley and Barney (1994) study the relationship between dividend yield and systematic risk on a sample of 235 US industrial firms from 1976-1980. They conclude that the higher the systematic risk of firms, the lower the dividend yield. The same explanation for managerial conservatism dating back to Lintner (1956) and Brav et al. (2005) is empirically proved by Aggarwal and Dow (2012) investigate the relationship between systematic risk and dividend policy of Japanese firm. The study covers 1,252 firm-year observations of Japanese non-financial and unregulated firms over three periods: 1990-1991, 1996-1997, and 2001-2002. Using (ß) as a proxy for systematic risk, they report a significantly negative relationship between systematic risk and each of dividend payout ratio and a five-year growth in dividends. Similarly, Harada and Nguyen (2011) prove the same negative relationship between systematic risk and dividend policy in a study conducted on 1431 Japanese firms over the period from 1995-2007.

Another strand of literature explains the relationship between firm risk and dividend policy through the life cycle theory of dividends. Venkatesh (1986) argues that firm maturity is characterized by less risk, a fact that motivates firms to pay dividends. The relationship between firm risk and dividend policy can be explained as shortages of cash flow hampering the ability of firms to pay dividends. Opler et al. (1999) investigates the determinants and implications of cash holdings amongst publicly traded U.S. firms in the 1971-1994 period. They report that firms with strong growth opportunities, higher business risk, and smaller size hold more cash than other firms and thus tend to pay lower amounts of dividends. Similarly, Lee et al. (2011) investigate the optimal payout ratio for US non-financial and non-utility firms over a 30-year period from 1969-2009. They report that based on flexibility hypothesis, a non-linear relationship exists between both of systematic and total risks and dividend payouts. High-risk firms have lower (higher) dividend payouts when the growth rate is higher (lower) than the rate of return on assets. This implies that firms with volatile earnings reduce their dividend payouts as a means of preserving cash flow to finance their strong investment needs. On the contrary, low growth firms have excess cash flows and limited investment opportunities. However, higher risk implies higher cost of capital and intensifies the free cash flow problem. Therefore, those firms have high dividend payouts when they face high risk to minimise the free cash flow problem.

Eldomiaty et al. (2014) study the relationship between risk-adjusted dividends growth rate and stock returns. The study covers all companies listed on DJIA 30 and NASDAQ 100 in the period from 1989 to 2011. The results indicate that financial managers are affected by the systematic component of stock return. At the same time, they set dividend growth rates in a manner that affect stock returns. Therefore, the mutual association between stock returns and dividends adjusted for systematic risks appear to be intrinsic.

A number of studies focus on the impact of an increase in unsystematic risk in explaining disappearing dividends (Campbell et al., 2001; Brandt et al., 2005) who argue that elevation of unsystematic risk reflects greater cash flow risk. Based on a large sample of U.S. firms from 1963 to 2000, Pastor and Veronesi (2003) argue that an increase in idiosyncratic risk is accompanied by the rise in cash flow risk that is expected to limit the dividend-paying capacity of firms. In the meantime, Malkiel and Xu (2003) hypothesise that an increase in firm-specific risk reflects a strong future growth potential that causes a decrease in dividend payment for the sake of future growth.

This view is supported empirically by Hoberg and Prabhala (2009), who study the impact of both systematic and unsystematic risks on the propensity of US firms to pay dividends from 1964 till 2004. They report that both types of risk explain nearly 40% of the Fama and French disappearing dividend puzzle. Moreover, the impact of unsystematic risk on the propensity to pay dividends is almost quadruple that of systematic risk (a 1% decrease in unsystematic risk as measured by the standard deviation of residual from regression of daily stock return increases the propensity of paying dividends by 39% versus 9% for systematic risk). Likewise, Kuo et al. (2013) investigate the relationship between firm risk both systematic and unsystematic on the propensity to pay dividends in the US, UK, Canada, Germany, Hong Kong, Singapore, France, Australia and other European countries from 1989 to 2011. They report that for all nine markets under study, both firm risk and market-driven risk explain from 14% to 33% of the probability of paying dividends. The two types of risk inversely affect the probability of firms to pay dividends across all markets in the study.

Similar results are reported by Lin et al. (2016) in a study conducted on Chinese firms in the period 2002-2012. They report an inverse relationship between unsystematic risk and dividend payout ratio. They attribute this result to the fact that a reduction in growth opportunities associated with firms entering the mature phase of their life cycle. In this respect, dividend payouts are increased to signal to the market a positive future performance.

Blau and Fuller (2008) study the relationship between unsystematic risk and dividend policy on a sample of 2,407 dividend-paying and non-dividend-paying firms listed on Compustat and CRSP from 1980 through 2000. They prove that firms with low level of unsystematic risk pay higher dividends thus confirming what the FCF indirectly predicts. In other words, shareholders will demand higher dividends to reduce the likelihood that management will have excess free cash flow that they could invest in projects that might increase the firm's unsystematic risk.

2.3.2 Corporate Earnings and Cash Flow

Introduction

The literature of corporate finance has cited earnings or profitability as one of the major determinants of dividend policy. Profitability is a measure of the business performance and is defined as the ability of a firm to generate profit. A firm's profitability is considered to be an important factor that affects dividend policy. This results from the fact that profitable firms are willing to pay higher amounts of dividends and hence a positive association is expected between firm's profitability and its dividend policy. The relationship between corporate earnings and dividends dates back to Lintner (1956) who finds empirical evidence that supports the fact that managers rely on current and projected future earnings in setting current dividends. Lintner (1956) also refers to dividend smoothing that is firms adjusting dividends in a gradual manner subsequent to an increase in earnings. Fama and Babiak (1968) and Consler et al. (2011) report a time series relationship between dividends and earnings. Earlier research finds that profitable firms pay dividends to convey their good financial performance in line with the predictions of the signalling theory (Chang and Rhee, 1990; Ho, 2003; Aivazian et al., 2003). Survey results confirm that managers regard profitability as a major determinant of dividend payout (Brav et al., 2005; Baker and Powell, 2000). The majority of studies demonstrate a positive association between profitability and dividend policy in different markets and across various industrial sectors (Baker at al., 1985; Gill et al., 2010; Jensen et al., 1992; Pruitt and Gitman, 1991; Charitou, 2000; Fama and French, 2001; Aggarwal and Dow, 2012; Thanatawee 2011; Denis and Osobov, 2008).

In the same vein, the pecking order hypothesis suggests that firms favour a specific financing scheme starting with retained earnings followed by debt financing and finally external financing sources (Myers, 1984; Myers and Majluf, 1984). Considering the costs of issuing debt and equity, it then follows that less profitable firms are not willing to pay dividends. Whereas, profitable firms capable of accumulating higher levels of retained earnings will find it more significant to pay dividends.

Other researchers argue that cash flow should be a stronger and more relevant determinant of dividend policy than earnings since dividends are actually paid out of the cash available to the firm (Alli et al., 1993; Goergen, 2005; Consler et al., 2011). Other studies prove that firms base their target payout ratios on cash flow rather than earnings (Andres, 2009) while others prove that cash flow volatility hinders the dividend-paying capacity of firms. On the contrary, other researchers argue that firms with high level of cash flow pay lower dividends in line with the flexibility hypothesis (Blau and Fuller, 2008) and the trade-off theory (Al-Najjar and Belghitar, 2011).

Empirical Evidence

Supportive Evidence

The relationship between corporate earnings and dividends dates back to Lintner (1956) who finds empirical evidence that supports the fact that managers rely on current and projected future earnings in setting current dividends. By interviewing the CEO's of 28 US companies for the period (1947-1953), Lintner reports that most companies have a target payout ratio and appear very concerned about the stability of dividends. Dividends are smoothed from one year to another, even with a sudden increase in earnings dividends adjust gradually. He also documents the fact that the market reacts positively to a dividend announcement and negatively to a dividend cut. Using Lintner's "partial adjustment model", Fama and Babiak (1968) study 392 major industrial firms for the period (1946-1964) and find a time series relationship between dividends (DPS) and earnings (EPS), which shows that managers only increase dividends when they are relatively confident that the dividend payment can be maintained. Similarly, Consler et al. (2011) report a positive relationship between earnings per share (EPS) and dividends per share (DPS) in a study conducted on 1,902 NYSE companies in the 2000-2006 period. Brav et al. (2005) survey 384 financial executives and conduct one-to-one interviews with US CEOs, CFOs and treasurers to identify the factors affecting dividend decisions. Their results prove that one of the key findings of Lintner (1956) still holds despite the 50-year time differential: dividend conservatism where managers of dividend-paying firms are reluctant to cut dividends and non-payers are reluctant to initiate dividends thus referring to the inflexible nature of dividends. Empirical results by Gill et al. (2010) confirm that profitability is a major determinant of dividend policy for both US service and manufacturing sectors. They study a sample of 266 US service and manufacturing firms for the year 2007 and confirm the fact that earnings as measured by operating profit are positively associated with the dividend payout ratio of companies in the two sectors under study. Sharon and Frank (2005) study the relationship between dividend payout ratio and two different measures of profitability which are ROE and EPS growth. By investigating a cross-section of 542 companies over the period from 2000-2004, they report a negative relationship between the dividend payout ratio and ROE and a positive relationship between EPS growth and dividend payout ratio thus confirming the fact that dividends are a function of growth in earnings. Similarly, highly profitable firms tend to declare and pay higher dividends and have high dividend payout ratios (Jensen et al., 1992; Amid and Abor, 2006).

Other researchers argue that dividends are not only linked to current level of earnings but also to the sustainability of past earnings and expected future earnings. However, unlike Lintner (1956) payout ratio is no longer the prime concern of managers who regard payout ratio as being more flexible. Baker and Powell (2000) conduct a survey on 603 US firms in manufacturing, utilities and wholesale/retail sector. The goal of the survey is to identify the major determinants of dividend policy in 1997 and compare it to the results of a previous survey conducted in 1983 (Baker at al. 1985). According to this survey the major determinants of dividend policy are the firm's level of current and expected future earnings as well as the continuity of the past pattern of dividends, results in line with those presented in the 1985 survey and consistent with Lintner's behavioural model of dividend policy. Moreover, a negative relationship is reported between earnings volatility and dividend payout ratio. This indicates that firms with low level of earnings volatility have better prediction for their future earnings and hence can pay higher level of their earnings as dividends. These results are in line with Pruitt and Gitman (1991) who survey 1,000 NYSE executives and report that the level of current and past earnings is a major determinant of dividend policy and assess the negative relationship between earnings volatility and dividend payout. Another recent study on Japanese firms' dividend policy is conducted by Aggarwal and Dow (2012). The objective of this study was to assess the determinants of dividend policy of Japanese firms including profitability as measured by return on assets. The study covers observations for Japanese non-financial and unregulated firms over three periods 1990-1991, 1996-1997 and 2001-2002 totalling 1,252 firm-years. They confirm that profitability as measured by ROE is positively correlated to both dividend payout ratio and dividend growth rate with a significant coefficient; parallel to Fama and French (2001) findings. Likewise, Thanatawee (2011) studies the determinants of dividend policy in Taiwan on a sample of 287 Thai listed firms from 2002-2008. Using return on assets (ROA) as a proxy for profitability, he reports a positive relationship between ROA and two measures of dividend policy that are dividend yield and dividend payout ratios.

The trend of declining dividend payment or the change in the propensity of paying dividends is investigated by a number of researchers. Charitou (2000) examine the role of earnings, losses and cash flows in setting the dividend policy of Japanese firms. A sample composed of 529 industrial Japanese firms from 1984 till 1995 (this sample includes 191 loss firms and 338 non-loss firms with positive dividends and positive operating income for at least five years prior to the first loss reported (for loss firms) and the first earnings decline (for non-loss firms). Results indicate that 80% of loss-making firms reduce or omit dividends during the initial loss year for the period under study contrary to the 15.7% dividend reduction witnessed in a control sample of firms with no losses during the same period. Moreover, dividend reduction rate for positive ROE companies ranged from 0 to 20% whereas the reduction rate for negative ROE firms ranged from 30.6% to 79.2%. On the other hand, cash flow level is positively and significantly correlated with dividend changes given earnings and losses. All of the above results confirm the fact that not only annual losses, but also earnings and cash flows, are useful in explaining dividend changes in Japan.

The decline in the propensity to pay dividends is explained by the influx of newly listed firms characterized by small low profitable firms with great investment opportunities. Fama and French (2001) study the change in dividend trends and the propensity to pay dividends for non-financial and non-utility NYSE, AMEX and NASDAQ companies in the 1963-1999 period. They prove that dividend payers have higher profitability than non-dividend payers. Over the entire period of the study, the ratio of NOPAT/Total Assets (used as a proxy for profitability) average 7.82% per year for dividend payers versus 5.37% for non-dividend payers. Earnings available to common stockholders/Total Assets (a ratio more relevant to the dividend decision) average 12.75% for dividend payers versus 6.15% for non- payers over the period from 1963-1998. Similarly, Goergen et al. (2005) report that 80% of German loss-making companies omit their dividends in the first year of loss irrespective of the size of the loss, past and projected level of earnings.

DeAngelo et al. (2004) conduct a study on US non-financial and non-utility firms to examine dividend paying trends over the period from 1978-2000. Their results indicate that dividends of industrial firms increase by 224.6% and 22.7% in nominal and real terms respectively over the period of the study coupled with a 50% plus decline in the number of dividend payers. These results indicate an increase in the concentration of dividends where the largest 25 dividend-paying firms account for 55% of total industrial dividends in 2000. A second step is to compare each of aggregate dividends and five-year average earnings in 1978 and 2000. The results also reveal that similar to aggregate dividends, earnings in both 1978 and 2000 are concentrated among the top end of the distribution. In conclusion, companies that realize over half of US industrial earnings are the major dividend payers which shows that earnings is still a major determinant of dividend policy.

International evidence on the declining propensity to pay dividends is presented by Denis and Osobov (2008). They study the determinants of dividend policy and the decline in the propensity to pay dividends through international evidence covering firms in the UK, the US, Germany, France, Canada, and Japan in the 1989-2002 period. They reach results consistent with DeAngelo et al. (2004) in that there is a strong correlation between the concentration of earnings and the concentration of dividends. For each of the three sub-periods understudy (1989-1993, 1994-1998, and 1999-2002) the top 20% of payers account for at least 73.3% of aggregate dividends in all six countries and frequently account for more than 90% of earnings.

Alzahrani and Lasfer (2012) study the impact of investor protection and taxes on dividend payouts on companies from the 24 OECD countries in the period 2000-2007. The results of the study show that profitability is a major determinant of cash dividend payouts in the all countries. They prove that firms with high levels of profitability have higher propensity to pay dividends, higher propensity to increase dividends and lower propensity to decrease their payouts.

Other researchers argue that cash flow should be more related to dividends than earnings since dividends are actually paid out of the cash available to the firm. Alli et al. *(*1993) and Consler et al. (2008) argue that cash flow is more realistic than earnings as a dividend policy determinant since the former is less influenced by accounting practices; also, it is cash flow that reflects the ability of the firm to pay dividends. Amidu and Abor (2006) and Anil and Kapoor (2008) report a positive relationship between cash flow and dividend payout ratio in Ghana and India, respectively. Mollah et al. (2000) and Holder et al. (2008) prove that firms with high levels of free cash flow have higher payout ratios in line with the free cash flow hypothesis. Likewise, Consler et al. (2011) find a positive relationship between cash flow per share and dividends per share in a study conducted on 1,902 US companies in the 2000 and 2006 period.

Andres et al. (2009) investigate the dividend policy of German firms over a 22-year period from 1984-2005. By using Lintner's (1956) partial adjustment model, they examine whether German firms have target payout ratios or not and whether those payout ratios are based on earnings or cash flows. The following results are reported: First, German firms pay out a lower proportion of their cash flows as dividends when compared to UK firms. However, on a published profits basis, German firms show significantly higher payout ratios. Second, using earnings as a base of measurement, target payout ratios tend to differ substantially from observed payout ratios in contrast to using cash flows as a base where the target and observed payout ratios were measured to be too close. This indicates the tendency of German firms to set their target payout ratios based on cash flows rather than on published profit.

Opponent View

According to the Trade-off theory, firms set their optimal cash holdings by considering a trade-off between the marginal benefits and costs of holding cash. Ferreira and Vilela (2004) argue that benefits of holding cash reduces the probability of a financial distress, help meet the investment needs of the firm and minimises the cost of raising external funds.

A number of studies suggest that the relationship between dividend policy and cash flow is dictated by firm maturity. Mature companies with investment opportunities limited relative to cash flow finance their investments out of available cash flow while the residual is paid out as dividends. But for firms with high investment opportunities relative to available cash flow, any investments in excess of cash flow would require issuing new shares that would increase the cost of capital. It then follows that for high-growth firms, the relationship between cash flow and dividend policy is negative whereas the relationship is positive for low growth firms with excess cash flow balances.

Conclusion

Throughout the literature of dividend policy, profitability and cash flow have been considered as two of the prime determinants of dividend policy. Lintner (1956) was the first to discuss the relationship between corporate dividend policy and each of current and projected future earnings. Empirical evidence has strongly supported this relationship as profitability was proved a major determinant of corporate dividend policy in different countries being examined, using different measures of profitability, varying industrial sectors and under different time periods (Baker and Powell, 2000; Baker at al., 1985; Fama and French, 2001; Aggarwal and Dow, 2012; Thanatawee, 2011; Denis and Osobov, 2008).

Other researchers argue that since dividends are actually paid out of the cash available to the firm, it follows that cash flow is a major determinant of dividend policy (Alli et al., 1993). Empirical evidence on the relationship between cash flow and dividend policy supported this positive association (Anil and Kapoor, 2008; Goergen, 2005; Consler et al., 2011).

2.3.3 Liquidity

Introduction

Liquidity measures the ability of the firm to meet its payment obligations. A firm's liquidity is an important factor that affects the decision of firms to pay cash dividends. In this respect, companies with high levels of liquidity are expected to have higher dividend payouts. Liquid assets could signal the ability of firms to pay dividends without the need to resort to external sources of financing (Ho, 2003).

In contrast, advocates of financial flexibility argue that firms need to respond in a timely and value maximising manner to unanticipated changes in their cash flow and investment opportunity set (Denis, 2011). Following this line of thought, firms with high levels of liquidity ought to have lower dividend payouts. Firms with excess cash do not waste it in dividend payment but retain it to invest in future projects (De Angelo et al., 2006).

Another strand of literature argues that increased cash holdings are associated with the declining dividend phenomena (Fama and French, 2001). This evidence stems from a change in firm characteristics such as an increase in unsystematic risk associated with higher cash flow uncertainty coupled with the tendency of firms to hold fewer inventories and receivables (Bates, 2009).

Empirical Evidence

Supportive Evidence

Empirical evidence supports the notion that companies with high levels of liquidity tend to pay higher amount of dividends in support for the agency theory of dividends. Chay and Suh (2009) conduct a study on corporate payouts in seven countries in the period 1994-2005. They report a positive relationship between liquidity and the propensity to pay dividends in France, Germany and Japan. Likewise, Goyal and Muckley (2013) find evidence that cash holdings have a positive impact on the propensity to pay dividends in a study covering 5840 industrial firms in ten Asian countries in the period 1990-2009. Similar results are reported by Bliss et al. (2015) who study the determinants of payout reductions for US companies in the period 1990-2010. They show that dividend reductions are more likely to firms with low levels of liquidity during the financial crisis period.

Opponent View

Other studies prove that firms favour financial flexibility in setting their dividend policy. De Angelo et al. (2006) study the impact of liquidity on the propensity to pay dividends for US industrial firms in the period 1973-2002. They prove that firms with high cash balances as measured by the ratio of cash to total assets are less likely to pay dividends. Likewise, Blau and Fuller (2008) report an inverse relationship between liquidity holdings and each of dividend payout ratio and dividend yield in Germany.

Jordan et al. (2014) conduct a study on corporate payouts in dual class firms. The sample includes 2641 firm year observations of non-financial dual class firms in the period 1995-2002. The results indicate that dual class firms with cash flow problems, low liquidity and few growth opportunities have higher dividend payouts. They attribute this evidence to the fact that dual-class firms rely on dividends as a pre-commitment device to mitigate agency related problems. Using other measures of liquidity, that is current ratio, Consler et al.

(2011) prove that US firms with high levels of liquidity pay lower amounts of dividends per share.

Banyi and Kahl (2014) study the declining propensity to pay dividends for US industrial firms from 1973 to 2011. The results prove that companies with high levels of cash holdings have lower propensity to pay dividends. They argue that this inverse relationship is related to precautionary motives of cash holdings in which firms' cash ratios increase in association with an increase in unsystematic risks. This precautionary motive is justified since firms tend to hold fewer inventories, receivables and invest more in research and development (Bates et al., 2009).

Conclusion

The impact of liquidity of a firm's payout policy is rather controversial. Despite the fact that liquidity affects the ability of firms to meet their obligations, current investment needs of companies affect their decision of whether to pay out excess cash flows in the form of dividends or hold cash for future investments. In this respect, companies with high costs of external finance tend to save a high proportion of their cash flows in the form of cash thus favouring lower payouts (Almeida et al., 2004). Likewise, the negative relationship between liquidity and dividend payout can be explained in light of the precautionary motives of holding cash in light of a change in firms' characteristics (Bates et al., 2009).

On the contrary, companies with relatively poor investment opportunities face high agency costs of cash accumulation that they tend to minimize through higher payout policies and lower cash holdings (Officer, 2011).

2.3.4 Leverage

Introduction

Financial leverage refers to the percentage of external financing to the amount of funds supplied by shareholders. Agency theory suggests that dividend policy and capital structure play a role in reducing problems of information asymmetry. In this respect, dividends and debt could act as alternating mechanisms that reduce the amount of cash flow kept at the discretion of managers (Jensen et al., 1992; Aivazian et al., 2003).

Other researchers argue that high levels of debt reduce the financial flexibility of firms and hamper their ability to capture value maximizing investments. In this respect, firms tend to preserve their cash flows for growth purposes rather than pay dividends or increase their leverage. Thus, a positive association is expected between dividend policy and leverage given the flexibility hypothesis (Blau and Fuller, 2008).

Empirical Evidence

Supportive Evidence

Empirical results on the relationship between financial leverage and dividend policy provide mixed results. At one extreme is the statistically significant negative relationship between debt ratio and dividend payout ratio in Jordan reported by Al-Malakawi (2007). However, it is worth mentioning that the sample used in the research included all financial companies listed in Amman Stock Exchange and these companies are highly leveraged.

Harada and Nguyen (2011) report a negative association between debt and dividend payout for all Japanese companies listed on Tokyo Stock Exchange over the 1995-2007 period. This negative relationship could be explained in the context of the strain that debt places on the free cash flow of firms thus lowering their dividend-paying capacity.

The former results stand in accordance with Bliss et al. (2015) who prove the existence of a positive association between leverage and the probability of a dividend reduction. This study is conducted on non-financial and non-utility companies listed on Compustat from 1990-2010. Using an interaction variable for crisis and leverage, they find that companies that are susceptible to external financing shocks are more likely to rely on dividend reduction as a substitute source of funding especially during periods of financial crisis.

Opponent View

Other studies fail to confirm the inverse relationship between dividend policy and financial leverage and even reported a positive relationship between the two variables. Sharon and Frank (2005) report a positive relationship between financial leverage as measured by the ratio of debt/total assets and dividend payout ratio. They argue that this relationship could be caused by firms increasing debt as a source of funding the dividend payment of firms. Similarly, Gill et al. (2010) confirm this positive relationship between debt/equity ratio and dividend payout ratio in the US. Likewise, a positive relationship between dividend yield and financial leverage is reported by Thanatawee (2011) in a study covering the dividend policy of 287 Thai listed firms from 2002-2008. This sheds a concern on the possibility of Thai firms using debt to pay dividends. Abor and Bopkin (2010); however, report as insignificant relationship between financial leverage and dividend policy in emerging markets which implies that dividend policy is independent of corporate policy decisions.

Blau and Fuller (2005) develop a model of dividend flexibility based on the notion that managers refrain from paying high dividends to preserve cash flow that increases their flexibility. This improves their ability to invest in projects that they believe will add value to shareholders in the long run but which shareholders would not provide the capital for because they think the projects are value reducing. According to this hypothesis, high cash flow levels are associated with lower debt and lower dividend payment. Empirical results for this study prove the direct relationship between leverage as measured by the ratio of debt to equity and dividend yield.

Florackis et al. (2015) study the relationship between dividend policy, managerial ownership and debt financing as substitution mechanisms to mitigate the agency conflict. They report a positive association between dividends as measured by total dividends to total assets and leverage. This result indicates that high debt levels increase the level of monitoring by capital markets and reduces entrenchment related agency costs. Accordingly, debt commits firms to disgorge cash flow in the form of dividends to constrain managers from using it to pursue personal goals.

Conclusion

The literature of dividend policy cited financial leverage as one of the major determinants of dividend policy. Jensen (1992) argues that financial leverage is negatively associated with the dividend policy of firms. This is based on the notion that firms with low financial leverage have abundant cash flows that could be distributed in the form of dividends as a means to minimise the problem of information asymmetry. This view has been empirically supported by a number of studies that include Al-Malakawi, (2007) Consler et al. (2011), and Harada and Nguyen (2011).

On the other hand, other researchers prove that dividend policy and financial leverage are positively associated in light of the theory of financial flexibility (Blau and Fuller, 2008). Other researchers explain this positive association as firms relying on debt as a means of financing their dividend payouts.

2.3.5Firm Size

Introduction

The relationship between firm size and dividend policy is based on the idea that larger firms are more mature and hence have easier access to capital markets, ample cash flows than smaller firms. Consequently, they can pay higher dividends and rely less on internally retained funds. The former view is empirically proved by Crutchley and Hansen (1989), Bassidiq and Hussainey (2010), and Al-Najjar and Belghitar (2011).

From an agency theory perspective, large-sized firms usually have a large number of stockholders that force them to pay higher dividends as a means of mitigating the agency conflict (Aggarwal and Dow, 2012).

The decline in the propensity to pay dividends evident throughout the world is related to the fact that the majority of publicly traded companies are newly listed small-sized companies characterized by strong growth potential that necessitate preserving their cash flows and refrain from dividend payment (Fama and French, 2001).

Other studies report a negative association between dividend policy and firm size (Gul, 1999).They attribute this relationship to companies with large market capitalization being highly leveraged and hence abstain from high dividend payment. Denis and Osobov (2008) report an inverse relationship between dividend policy and firm size especially in markets that are dominated by large market capitalization companies that operate in fast growing sectors such as technology.

Empirical Evidence

Supportive Evidence

Empirical results on the relationship between firm size and dividend policy provide mixed results. Crutchley and Hansen (1989) report a positive relationship between firm size and dividend policy for 603 US companies from 1981 to 1985. They explain this relationship by the scale effect where large sized firms have lower flotation costs than small firms and hence can economically rely on dividends. In addition to being characterized by lower managerial concentration that places dividends as an efficient monitoring mechanism. Likewise, Al-Malakawi (2007) argues that large firms are associated with easier access to funds and fewer constraints as compared to small firms and hence are capable of paying higher amount of dividends. This justification is empirically proved in a study covering160 Jordanian firm over the period from 1989 to 2000. Comparable results are reported by Thanatawee (2011) in Taiwan who finds that large-sized firms are associated by high dividend yield and high dividend payout ratio. He relates this phenomenon to the fact that large-sized firms are mature ones with excess cash flows that support higher levels of payout.

Another perspective on the relationship between firm size and dividend policy is presented by Fama and French (2001), who argue that the decline in the propensity to pay dividends is driven by the change in the characteristics of publicly traded companies towards newly listed, small companies with strong growth opportunities that make them less likely to pay dividends. They study the change in dividend trends and propensity to pay dividends for non-financial and non-utility NYSE, AMEX and NASDAQ companies for the period from 1963-1999. Similar evidence is reported for US companies in the subsequent period from 1999 to 2010 where large-sized firms are more likely to initiate or increase their dividends whereas small-sized firms have higher propensity to omit dividends (Rapp et al., 2014). During the 1963-1967 period, total assets of dividend payers average about eight times those of non-dividend payers. Later and during the period 1993-1998, the total assets of dividend payers average more than 13 times those of non-dividend payers. Using another proxy for size (book and market values of assets and common stock), dividend payers account for 93.5% and 95.8% of the aggregate book value of assets and common stock in 1973 and 1977, respectively. The same trend continues to prevail in the 1990s where dividend payers account for more than three quarters of the aggregate book market values of assets and common stock. Following the same line of thought, Hoberg and Prabhala (2009) explain the positive association between firm size and dividend policy by the fact that large-sized firms are more mature ones with ample cash flows and low growth opportunities that make them good candidates for dividend payment. They find a positive relationship between firm size and the propensity to increase dividends for US companies between 1963 and 2004.

Opponent View

The positive relationship between dividend policy and measures of firm size does not hold across all studies and markets. Aivazian et al. (1999) use log of sales as a proxy for firm size and find that the relationship between firm size and dividend yield is negatively correlated the fact that they attribute to the composition of industries in the period under study. Gul (1999) conduct a study on all firms listed on Shanghai stock exchange over the period from 1991 to 1995 and report a negative relationship between firm size and dividend policy. This is attributable to large firms being associated with high debt levels that make them subject to bankruptcy and hence they refrain from dividend payment. Abor and Bopkin (2010) find a negative relationship between market capitalization as a measure of firm size and dividend payout in emerging markets, which they interpret as high market capitalization indicating more growth and the need to retain more funds.

Denis and Osobov (2008) find that in the UK, Germany, France and Japan, dividend payers account for 92% of the total market capitalization in the 1999-2002 period. This concentration however is not reported for the US and Japan. This is comparable to DeAngelo et al. (2004) who report that non-payers are high market capitalization companies concentrated in the technology industries.

Conclusion

The relationship between firm size and dividend policy is based on the notion that large firms have better access to external capital and have a larger number of shareholders and hence can pay higher amounts of dividends. Empirical evidence on firm size as a determinant of dividend policy provides mixed evidence. Some researchers find evidence that supports the presumed positive relationship between firm size and dividend policy. They use log of total assets, number of common stockholders, log of market capitalization and prove a positive relationship between those measures and each of dividend payout ratio and dividend yield. (Crutchley and Hansen, 1989 and Al-Najjar and Belghitar, 2011). Others report a decline in the propensity to pay dividends that they explain as the influx of new publicly listed companies with strong growth opportunities that they seek to pursue at the expense of dividend payment (Fama and French, 2001).

On the contrary, a number of studies report a negative relationship between firm size and dividend policy (Gul, 1999; Denis and Osobov, 2008). The former relates this relationship to the fact that large market capitalization companies that are either highly indebted or operate within sectors facing strong investment opportunities and thus are less capable of paying high level of dividends.

2.3.6Corporate Taxation

Introduction

The impact of corporate tax rate on dividend policy is indirectly inferred as the influence of changes in corporate tax structures on depressing after-tax profits (Brittain, 1964). Since profitability and dividend policy are hypothesised to be positively associated (Lintner 1956), it then follows that an increase in corporate tax rate is likely to reduce the capacity of firms to pay dividends (Singhania, 2006). On the contrary, managers who place more weight on profit maximization either because they own a large number of shares or due to the presence of large shareholders, tend to increase dividends following a tax cut (Chetty and Saez, 2010).

Another view holds that since interest payments are tax-deductible while dividends are not, this creates a preference for debt over equity financing at the corporate level, which anticipates a reduction in dividend payment over the long run. Another effect is favouring retained earnings over dividends to create long-term capital gains, this being amplified as corporate tax rates increase especially if dividends are subject to dual taxation (Morck and Yeung, 2005; Singhania,2006).

Empirical Evidence

The impact of a change in corporate taxation on dividend policy is tested by Nadeau and Strauss (1993) who investigate the economic impact of implementing a partial integration tax policy on dividend policy. This partial integration policy means trading off higher corporate income taxes for a reduction in shareholder tax burden that creates a revenue neutral environment providing the government with an unchanged amount of tax revenue. The study is simulated on US dividend payouts and taxes over the period from 1962 to 1986. The results show an increase in dividend payouts following the application of the partial integration tax policy. This could be explained as the tax relief caused by lowering the dividend tax income (even at increased rates of corporate taxation) reduces the cost of using dividends as a signalling mechanism and encourages companies to have higher payouts.

Wu (1996) examine the impact of changes in personal tax regimes on corporate dividend policy for companies listed on SandP 500 and SandP 400 from 1965 through 1996. Results show an increase in dividend payout ratio following the revenue act of 1978 that led to a reduction in the corporate tax rate and a change in shelter tax rules.

Anil and Kapoor (2008) study the impact of corporate taxes on the dividend policy of Indian technology companies in the period from 2000-2006 and conclude a positive but insignificant association between dividend yield and corporate taxes. Likewise, Ince and Owers (2012) investigate the impact of various dividend and corporate tax regimes on the dividend policy of US companies during four periods between 1979 and 2002. They report that during the initial period from 1979 to 1981, corporate taxes were steep coupled with the high tax rate on both dividend income and capital gain. Consequently, companies relied heavily on debt financing that contributed to high firm value for firms with high dividend payouts.

Conclusion

Since dividend payment consumes a considerable amount of after tax profits, it then follows that an increase in corporate tax rate is likely to depress after tax profits and reduce the dividend-paying capacity of firms (Brittain, 1964; Singhania, 2006). However, dividend taxation cannot be examined in isolation from dividend taxation. For instance, if dividends are disfavoured as a means of earnings distribution either due to the tax rate on dividends being higher than the tax rate on capital gain or due to the possibility of deferring tax payment on capital gain. In this respect, companies would favour to retain earnings for investment purposes or use alternative means of payment such as repurchases (Hildreth and Richardson, 1999, p. 665). Applying an integration tax system is likely to relieve the burden of dual taxation and hence could increase the amount of cash dividends paid by firm (Nadeau and Strauss, 1993). The integration tax system partially resembles the imputation tax system applied in the UK, where a company is subject to corporate tax on all its distributed and undistributed profits, while income tax is not deducted at source from dividends paid to shareholders. In this respect, the total tax is equal to corporation tax plus effective capital gain tax plus the reduced dividend tax.

Empirical evidence does not provide consistent results as to the relationship between taxation and dividend policy. Anil and Kapoor (2008) prove an insignificant relationship between dividend policy and corporate taxation for Indian technology firms. On the contrary, Ince and Owers (2012) prove that high corporate tax rates are associated with high levels of dividend payout.

2.3.7Industry

Introduction

The sector or industry within which the firm operates appears to have an influence on its dividend policy, on the continuum of having industries characterized by high dividend payout ratios such as utilities to zero dividends in most high-tech industries.

Some researchers find that the dividend payout and dividend yield vary across different industries (Michel, 1979). Others report a change in dividend policy of firms depending on the level of regulation facing the industrial sector to which the firm belongs (Moyer et al., 1992; Ferris et al., 2006). Other researchers prove that the growth rate within an industry is the primary determinant of dividend policy not the industry type by itself (DeAngelo et al., 2004; Denis and Osobov, 2008).

Empirical Evidence

Supportive Evidence

Michel (1979) studies the impact of the industry type on dividend policy on a sample covering 13 industries over the period from 1967-1976. By comparing the mean and standard deviation of dividend payout ratio and dividend yield, he concludes that in each of the years under study, electric power utilities had the highest dividend payout while the lowest dividend payout was found in the business equipment, life insurance, aerospace and aircraft industries.

Utilities are subject to extensive regulation with the goal of balancing the interests of both customers and shareholders. In this respect, rates are set by regulators, and the utility is allowed a rate of return on rate base assets which makes the rate of return previously determined. Smith (1986) argues that utility managers adopt high dividend payout policies as a means of increasing the allowed rate of return on equity. Moyer et al. (1992) tests the Smith hypothesis which is a positive relationship between regulatory risk and utility dividend payout ratios. The study was conducted on 69 electric utility firms listed on Compustat Annual Industrial Tapes covering the period from 1978-1986. They classify firms according to their regulatory risk. Using dividend payout ratio and dividend yield as dependent variables in two sets of regression equations, they conclude that regulatory climates rated average and below average are associated with high dividend payout ratios and high dividend yield than utilities with above average ratings. These results indicate that utilities have high dividend payout ratios as a response to varying levels of regulatory risk. In other words, high payout ratios and high dividend yields are associated with high regulatory risk. Moyer et al. (1992) explain their findings as utilities paying high percentage of their earnings as dividends to force themselves to seek external capital as a means of monitoring and substitute for insider agency control mechanisms.

Ferris et al. (2006) study the aggregate pattern of dividends and earnings in the UK and Japan over the period from 1990-2001. By conducting an event study of 973 Japanese firms and 3,551 UK firms, their results indicate that the pattern of aggregate dividends and earnings in the UK and Japan differ from their US counterparts. Concerning earnings concentration, an increase in earnings concentration is evident in the UK and among independent Japanese firms. They also report a decline in the percentage of dividends paid by keiretsu firms[3]. This results from the business protection provided by industry groupings and hence, the dividend policies of those firms tend to be more responsive to corporate performance with less need to use dividends as signalling mechanisms or to reduce agency costs.

The relationship between industry and dividend policy is also evident from the fact that non-dividend payers with high market capitalization tend to be concentrated in the high-tech markets in the UK and the US, according to DeAngelo et al. (2004) and Denis and Osobov (2008). Over the period from 1999-2002, high-tech firms accounted for 30% and 23% of the market cap in the US and Canada, respectively, and only 5% of the high-tech US firms and 7% of the high-tech Canadian firms paid dividends during this period. On the other hand, high-tech firms accounted for only 5% to 18% of the market cap in Germany, the UK, France and Japan, and a large percentage of those companies (28% in Germany and 84% in Japan) paid dividends. These findings indicate that industry per se is not a major determinant of dividend policy, but it's rather the growth opportunities among firms in the same industry.

Opponent View

Dempsey et al. (1993) examine the impact of industry type on dividend policy and whether companies within the same industry tend to have similar dividend payouts or not. The study examined42 different industries form Value Line Investment over two seven-year periods of 1974-1980 and 1981-1987. They study dividend behaviour at the individual company level after controlling for firm specific factors known to affect dividend payouts. This study reports weak support for the impact of industry type on dividend payout as follows: only 5 out of the 42 industries under study are proved to have a significant and persistent effect on dividend payouts, whereas 10 industries have a significant but non-persistent effect on dividend payouts. The remaining 27 industries appear to have an insignificant effect on dividend policy.

[3]A keiretsu refers to two sets of relationship between Japanese firms (vertical grouping of upstream suppliers, manufacturers, distributors or horizontal keiretsu consisting of commercial banks, other financial institutions and large manufacturing companies).

Conclusion

The type of industry to which the firm belongs is hypothesised to have an impact on dividend policy. This relationship stems from the regulation among the various industries, growth rate and the size of firms within an industry. Some researchers report a difference in the dividend yield and dividend payout ratio for industries belonging to utilities and high-tech (Michel, 1979; Moyer et al., 1992; DeAngelo et al., 2004; Ferris et al., 2006; Denis and Osobov, 2008). As a counterpoint, Dempsey et al. (1993) demonstrate that the type of industry does not have an impact on the dividend policy of firms.

2.4UK Dividend Policy- Empirical Evidence

2.4.1 Empirical Evidence on Dividend Policy Theories- UK Evidence

2.4.1.1 The Agency Theory and Free Cash Flow Hypothesis- UK Evidence

A number of studies examine the agency theory of dividends in the UK. Khan (2006) investigates the impact of institutional holdings on dividends on a cross section of 330 listed UK companies in the period 1985-1997. He reports an inverse relationship between the percentage of shares held by institutional investors and dividend payout except for insurance companies. This implies that institutional investors exert efficient monitoring that they can rely less on dividends to substitute their monitoring roles. Conversely, agency problems tend to be acute in firms with high shareholding. Therefore, the weak monitoring by insurance companies relative to other institutions justify having higher payouts.

Similar results are reported by Renneboog and Trojanowski (2011) who analyse a large panel of 985 U.K. non-financial firms in the 1992-2004 period and report that the impact of the voting power of shareholder coalitions on the payout ratio is consistently negative implying that strong shareholders do not need dividends to overcome the agency problem.

Farinha (2003) studies the relationship between dividend policy and management entrenchment on a sample of 693 non-financial and non-utility firms over two five-year periods from 1987-1991 and 1992-1996. He uses institutional ownership and insider ownership as two proxies for agency conflict. The results prove that the higher the percentage of institutional blockholders, the higher the dividend payout of firms. This could indicate that institutional investors view their own monitoring efforts to be too costly, the fact that necessitates having high dividend payouts. On the other hand, the study reports a U-shaped relationship between insider ownership and dividend payout ratio as follows: there is an inverse relationship between the percentage of shares held by insider investors and dividend payout ratio up to thirty percent ownership. This indicates that when managers hold little equity, shareholders are more dispersed, agency problems are higher and shareholders seek protection against non-value maximising activities through higher dividend payouts. As managers' ownership increases, agency costs decrease since managers bear more of the costs and are insulated from external disciplining forces. This reduces the need to payout high amounts of dividends. Likewise, Al-Najjar and Hussainey (2009) conduct a study on 400 non-financial UK companies in the period 1991-2002. They find evidence that high levels of insider ownership reduce the agency problem and decrease the propensity of firms to pay dividends.

2.4.1.2 The Life Cycle Theory of Dividends- UK Evidence

Previous research studies the applicability of the lifecycle theory of dividends through the association of growth opportunities to dividend payouts. Denis and Osobov (2008) conduct a study on the life cycle theory of dividends in six countries including the United Kingdom in the period 1989-2002. They report that UK firms with poor growth opportunities have stronger propensity to pay dividends. Similarly, Farinha (2003) examines the impact of growth opportunities on dividend payouts in a study conducted on a sample of U.K. non-financial and non-utility firms over two year periods from 1987-1991 and 1992-1996. Using two measures of growth opportunities that are: growth of total assets and market to book ratio of equity, he reports an inverse relationship between the former variable and dividend payout ratio while results for the former variable appear to be mixed.

In studying the disappearing dividend phenomena in the UK, Kuo et al. (2013) examine all UK listed and de-listed firms in the period 1989-2009. Their results indicate that companies with high growth opportunities as measured by the ratio of market-to book have lower propensity to pay dividends. The relationship between growth of total assets and the propensity to pay dividends appears mixed. In addition, they report a positive association between earned capital as measured by the ratio of retained earnings to book equity and the propensity to pay dividends for the entire period of the study. However, this result does not hold for sub periods (1989-1997) and (1998-2009).

Al-Najjar and Belghitar (2011) study the dividend policy of 400 UK non-financial firms in the period from 1991-2008. They use sales growth and market-to-book ratio as measurements of firms' investment needs, and they all confirm that dividend and investment decisions are not independent but they are rather negatively correlated.

On the other contrary, Basiddiq and Hussainey (2010) study the relationship between investment opportunities and dividend policy on a sample of 282 non-financial UK firms in 2007. They prove that firms with strong growth opportunities distribute larger dividends the fact that they attribute to those firms being large in size and highly profitable.

Survey results conducted by Dhanani (2005) on 164 companies listed on LSE indicate that UK managers do not consider dividend retention as a source of financing their investment needs. This view holds despite the fact that those surveyed managers consider internal sources of financing by retained earnings as a cheaper source of finance. This could be interpreted as factors that encourage dividend payment are considered to be more important than retaining dividends for future investment. In addition, the amount of dividends might be insignificant to contribute sufficiently to future investment needs.

Geiler and Renneboog (2015) study the impact of dividend taxation and earnings on the payout channel of 1906 UK firms in the period 1997-2007. They prove that UK firms with high market-to-book ratios pay out more dividends. This finding violates the pecking order hypothesis in the sense that companies with strong growth opportunities pay out high levels of dividends instead of retaining earnings that could be the cheapest source of funding.

Driver et al. (2015) investigate the behaviour of UK dividend paying firms in the period 1997-2012, a period that encompasses the global financial crisis. Evidence proves that the market-to book ratio as a measure of firm growth is negatively and significantly associated with log of cash dividends for young firms of both small and large size. On the contrary, firm growth is an insignificant determinant of cash dividends for old large-sized companies and when dividend to total assets is used as a dependent variable. The interaction variable of market-to-book and crisis appears to be cancelled out indicating that investment opportunities are of less importance during the period of financial crisis. The above results indicate that the life cycle behaviour of dividends only holds for young companies and not for all dividend measures.

2.4.1.3 Dividend Signalling- UK Evidence

A number of studies examine the extent to which UK dividend policy conform to the theory of signalling. Bun (2005)investigates a sample of companies featured in the FTSE all share index for the period (1992-1998) with the exception of finance and oil and gas sectors. Through the classification of companies according to their dividend payment patterns (always increase, smooth, pay-nothing, irregular and follow earnings), he concludes the following: first, not all firms are dividend signallers. Second, dividend signallers link dividends to the expected permanent earnings that are unobserved by the general public. Third, changes in dividends follow managers' revision of their earnings forecast of permanent earnings. Fourth, the percentage of insider holdings (the percentage of ownership by the firm's directors), the market cap and the asset book value are statistically significant in determining whether firms use dividends to signal or not. In conclusion, firms with more diversified shareholders, lower concentration of outsiders are more likely to use dividends to signal whereas large firms with larger market capitalization and asset book values do not need to use dividend as a signalling mechanism.

Survey results by Dhanani (2005) provide strong evidence that UK managers use dividends as a signalling mechanism coupled with other communication tools. They indicate that dividends are used to signal future corporate performance rather than investment opportunities.

Other researchers, Vieira and Raposo (2007) find a positive and significant relationship between previous dividends per share and cumulative abnormal stock returns on a sample of 3278 dividend events for companies listed on LSE. Similarly, Hussainey (2009) studies 4,568 U.K. firm-year observations of changes in dividends for the period from 1996-2002. His evidence supports using dividends as a signalling mechanism in the UK due to the following results: first, current stock returns include information concerning future earnings much more strongly for dividend-paying firms than for non-dividend-paying firms; second, current stock returns of companies that increase their dividend levels incorporate stronger information concerning the anticipation of future earnings than non-dividend increasing firms and finally, the use of dividends to signal future prospects of the firm (through the association of stock price anticipation of earnings) is more statistically significant for loss-making firms.

On the contrary, Hussainey and Al-Eisa (2009) examine 33 non-financial UK firms from 2000-2007 that have suffered a decline in their previous earnings growth after at least four years of sustained annual earnings growth. Their results prove show that 80% of the firms under study have increased their dividends at the year of decline in growth rate of earnings. They also report a negative association between the change in dividends payment and future performance which raises the question of whether the increase in dividends is a response for favourable prospects or just represents a means of satisfying shareholders about the firm’s earnings. The change in dividends paid does not appear to be an important signal of the future prospects for firms with a declining growth in earnings.

2.4.1.4 Tax and Clientele Theory-UK Evidence

Poterba and Summers (1984) study the impact of taxes on investors’ valuation of stocks and capital gain in the UK. They use daily and monthly dividend, price and return data for 16 large UK companies between 1955 and 1981, a period that witnesses two major changes in the tax regime of dividends in the United Kingdom. Results indicate that the tax penalty of dividends was reduced from 74% to 45% between tax regime II (a 30% tax rate on capital gain) and tax regime III (reducing the dividend tax rate on personal and corporate investors) resulting from a decline in the marginal tax rate on dividends. Moreover, they report an increase in ex-ante return on stocks (even in the months when the company is not paying dividends) following a lower tax rate on dividends. On the other hand, taxation of dividends reduces their valuation by investors and changes the equilibrium relationship between dividend yield and stock returns. In conclusion, tax changes affect security returns, and weighted averages of investor tax rates may provide a reasonable approximation to the tax preferences prevailing in the marketplace thus confirming the tax clientele effect theory.

2.4.1.5Residual Theory- UK Evidence

The residual theory of dividends is among dividend theories that are not extensively studied in the UK. Nevertheless, Dhanani (2005) surveys UK managers from 119 companies listed on LSE and 45 listed on AIM. The results of the survey indicate that managers of high growth firms consider dividends a residual to be paid after fulfilling their investment needs. In this respect, they underestimate the role that dividend cuts play in signalling negative future performance believing that their shareholders favour capital gains to cash dividends. Salih (2010) investigates the irrelevance proposition of dividends and argues that if dividends are irrelevant, then companies should set their payouts based on a residual policy. He studies 590 firms across 15 industries in the period 1998-2007 and concludes that UK companies do not follow the residual theory of dividends except for insurance companies and banks.

2.4.2 UK Determinants of Dividend Policy

2.4.2.1 Firm Risk- UK Evidence

The relationship between dividend policy and firm risk both systematic and unsystematic has been profoundly examined in the US market. However, the UK market suffers from scarcity of research on the impact of risk on dividend policy particularly unsystematic risk. Nevertheless, some studies that tackle the impact of risk on cash dividend payouts have been reviewed below.

The majority of studies focus on the relationship between systematic risk and dividend payouts. Al-Najjar and Hussainey (2009) find that UK companies with high levels of risk have lower propensity to pay dividends the fact that they attribute to high risk firms being more prone to bankruptcy risks that hinder their dividend paying capacity. Al-Najjar and Belghitar (2011) argue that high risk firms suffer from cash flow shortages and hence they lower their dividend payouts as a means of preserving cash. They empirically prove an inverse relationship between systematic risk (ß) and the dividend yield of UK non-financial companies in the period 1991-2008.Similarly, Kuo et al. (2013) investigate the relationship between firm risk both systematic and unsystematic on the propensity to pay dividends in the UK. The sample understudy includes listed and de-listed non-financial and unregulated firms in the period 1989 through 2009.They conclude that both types of risk significantly explain the decline in the propensity of paying dividends in the UK.

2.4.2.2 Corporate Earnings and Cash Flow- UK Evidence

Empirical evidence on the impact of earnings on dividend policy in the UK is similar to other markets. Benito and Young (2003) study the phenomena of dividend cuts and omissions in light of firms' financial characteristics. The sample includes all UK non-financial firms listed on London Stock Exchange in the period 1974-1999. They prove that low levels of profitability among dividend omitting companies is the single most important factor influencing the phenomena of increased dividend omissions. In addition, high levels of cash flow lower the probability of omitting dividends. Likewise, Kuo et al. (2013) report that a decline in the propensity to pay dividends in the UK after 1990 driven by a decline in profitability associated with increased number of newly listed firms with strong growth opportunities while an upward trend appears from 2007 to 2009 during recessionary periods suggesting a signalling role played by dividends.

Ferris et al. (2006) study the aggregate pattern of dividends and earnings in the UK over the period from 1990-2001. They prove that the profitability of dividend paying firms averages 13.54% compared to 1.41% for non-payers. Newly listed dividend paying firms are about 10 times more profitable than their non-dividend paying counterparts.

Similar results are reported by Driver (2015) for dividend paying firms in the UK where he proves a consistent positive impact of profitability (as measured by the log of net operating profit after tax) on the log of cash dividends. Denis and Osobov (2008) use two proxies for profitability that are operating profit to total assets and profit after tax scaled by total assets and report that an increase in the two measures increases the propensity to pay dividends for UK firms in the period 1989-2002. Similarly, Renneboog and Trojanowski (2011) study the dividend policy of 985 non-financial UK firms in the period 1992 through 2004 and report that high levels of profitability increase the propensity of paying cash dividends in line with Bassidiq and Hussainey (2010) that prove that companies with high levels of profitability have higher dividends per share, an implication of the reliance of dividends as a signalling mechanism.

In studying the impact of accounting data on the amount of dividends paid in the UK, Atieh and Hussain (2012) report a consistently positive and significant relationship between each of profitability and operating cash flow and cash dividends paid for UK non-financial firms listed on LSE in the period 1994-2004.

In line with the trade-off theory, Al-Najjar and Hussainey (2009) report a negative relationship between cash flow holdings and dividend policy for a sample of 400 UK non-financial companies in the 1991 to 2002 period. Likewise, Al-Najjar and Belghitar (2011) report similar results in for the same sample over the period from 1991 to 2008.

2.4.2.3 Liquidity- UK Evidence

In line with trade-off theory that implies that firms set their optimal cash holdings by considering a trade-off between the benefits and costs of holding cash. Al-Najjar and Belghitar (2011) investigate corporate cash holdings and dividend payments for UK companies in the period 1991-2008. They find a consistently negative and significant relationship between the ratio of cash to total assets and dividend yield. This relationship is simultaneous which implies that dividend paying firms hold less cash as they are capable of raising funds at lower transaction costs than non-dividend paying firms. Similar results are reported by Ma (2012) who compares the determinants of dividend payouts in the UK and other industrial countries in the period 1989-2010. He reports an inverse and significant relationship between the ratio of dividends to total assets and liquidity as measured by the ratio of cash scaled by total assets. This indicates that UK companies favour high liquidity of cash flows therefore, they are less likely to use cash dividends as a payout channel and prefer to reserve cash for liquidity concerns.

A number of UK studies report an insignificant relationship between cash holdings and dividend policy. Farinha (2003) finds that liquidity is negatively associated with dividend payout ratio but the coefficient is not significant. Likewise, Bassidiq and Hussainey (2010) report an insignificant relationship between current ratio and dividends per share. This evidence does not lend support to liquidity being correlated with free cash flow. Therefore, UK firms do not appear to payout their excess cash holdings to minimize the agency problem.

2.4.2.4 Leverage-UK Evidence

The impact of financial leverage on cash dividend policy in the UK appears mixed. On one hand, Benito and Young (2003) study the phenomena of dividend cuts and omissions for companies listed on LSE in the period 1974-1999. Using debt/total assets as a measure of financial leverage, they report that the higher the leverage, the higher the probability of a dividend cut or omission. They argue that debt covenants become more binding for firms in the long run, a fact that reduces their dividend-paying capacity. In this respect, the dividend policy of firms becomes strongly dictated by the amount that firms can borrow. Renneboog and Trojanowski (2011) find similar evidence to support the negative relationship between the debt to total assets and the propensity to pay dividends using a different time period 1992 through 2004. Likewise, Farinha (2003) examines 693 companies in the period from 1987-1991 and 603 companies in the 1992-1996 period and proves that the higher the financial leverage of firms (as measured by debt to total assets), the lower the dividend payout ratio.

Other studies fail to find an insignificant relationship between dividend policy and financial leverage. Al Najjar and Hussainey (2009) and Bassidiq and Hussainey (2010) report an insignificant relationship between the borrowing ratio of firms and each of the propensity to pay dividends and the amount of dividends paid in the periods 1991-2002 and 2007 respectively. These findings minimise the role that financial leverage plays in determining the dividend decision.

On the contrary, Khan (2006) proves that companies with high debt to total assets ratio pay higher amounts of dividends per share. Al-Najjar and Belghitar(2011) use dividend yield as proxy for dividend policy and prove that highly leveraged firms pay have higher dividend yields the fact that they attribute to using dividends to signal a sound financial situation so that lenders tend to lend them at an attractive rate. Driver et al. (2015) investigate the impact of leverage on dividend payouts during the financial crisis. Their results prove that the interaction variable of crisis and leverage is negative thus indicating that firms with high leverage reduce the amount of dividends paid coinciding with the tight credit conditions.

2.4.2.5 Firm Size- UK Evidence

Empirical evidence on the impact of firm size on dividend payouts in the UK mainly report that large-sized firms pay higher dividends when compared to small-sized ones. The results of surveying UK managers on dividend policy by Dhanani (2005) indicate that small-sized firms tend to follow more flexible dividend policy than large-sized firms due to their more stringent capital structure. Al-Najjar and Hussainey (2009) find a positive relationship between firm size and dividend policy for 400 non-financial companies listed on London Stock Exchange from 1991 to 2002 that they explain as firm size acting as an index to the cost of external debt financing. Similar evidence is reported by Bassidiq and Hussainey (2010) for a sample of 282 UK non-financial firms in 2007, a proof of the transaction cost theory under which large firms pay higher amounts of dividends because they have lower transaction costs associated with raising external capital. Likewise, Al-Najjar and Belghitar (2011) confirm this positive relationship on a sample of 400 non-financial firms in the period from 1991 to 2008. They attribute this association to large firms facing low financial distress and hence are capable of holding lower levels of cash and paying higher dividends.

Ferris et al. (2006) examine corporate payouts patterns in the UK by studying a sample of 3,551 companies in the period 1989-2002. They find that dividend payers are twice as large (in terms of asset size) as non-dividend paying firms. The larger size of dividend payers holds for all sub periods since 1991 and appears to increase over time. During the sub period 1995-2002, the assets of newly listed dividend payers are almost four times as large as non-payers.

On the contrary, Farinha (2003) find a negative relationship between market capitalization as a measure of firm size and dividend payout in the UK and emerging markets, which they interpret as high market capitalization indicating more growth and the need to retain more funds.

2.4.2.6 Corporate Taxation-UK Evidence

Investigating the impact of corporate taxation solely on UK dividend policy is scarcely studied in the UK. However, the relationship between corporate taxation and UK dividend payouts is examined by studying the impact of corporate and income taxes simultaneously. Lasfer (1996) investigates the impact of corporate taxation on the target payout ratio of 108 industrial and commercial companies in the period 1973-1983. They find evidence that companies set their payout ratios to minimise their tax liability and maximise the after-tax return to their shareholders.

2.4.2.7 Industry-UK Evidence

The inclusion of industry analysis in studying dividend policy includes the tendency of firms that belong to different industries to abide by some theories of dividend policy or the impact of different types of industries on the propensity to pay dividends or payout levels. Dhanani (2005) surveyed UK managers from different industrial sectors and concluded that managers of both financial sector and utility firms support the signalling role of dividends more than their counterparts in industrial, commercial or service sector firms. On the contrary, Salih (2010) surveyed 208 UK managers from 15 industrial sectors and concluded that technology firms are the most concerned with dividend signalling. This could be attributable to the fact that those firms operate in a fast growing sector with intense changes and developments that makes problems of information asymmetry more severe. In this respect, managers believe that they use dividends to convey information about the future potential of firms to their shareholders.

Table 2-1: Summary of Empirical Work on UK Dividend Policy

Author(s)/ Purpose	Methodology	Findings	Conclusion
Poterba and Summers (1984) To study the impact of taxes on investors' valuation of dividends and capital gain.	*Dependent Variable* Pre-tax return on stock *Independent Variables* Market Return, Dividend Yield, ß, Indicator Variable for each tax regime, Square of dividend yield. *Sample* Daily and monthly data for 16 large UK companies from 1955 through 1981 including ex-dates. *Model* Generalized Least Square Procedure (GLS)	Taxation of dividends reduces their valuation by investors. Taxes change the equilibrium relationship between dividend yield and stock returns. Tax changes affect security returns, and weighted averages of investor tax rates may provide a reasonable approximation to the tax preferences prevailing in the marketplace.	Support for the tax clientele effect theory of dividends in the UK.
Lasfer (1996) To study the impact of taxation on corporate	*Dependent Variables:* Dividend payout ratio *Independent Variables:* EPS, personal tax rate, individual tax rate.	There is a negative association between dividend payout ratio and both corporate and personal taxation when tax credit is	Firms should set their dividend policies to minimize the tax

Author(s)/ Purpose	Methodology	Findings	Conclusion
dividend policy	*Sample:* 108 industrial and commercial UK companies in the period from 1973-1983. *Model:* OLS	recoverable. Taxation affects both dividend payout ratios and ex-day returns The higher the investment opportunities, the higher the propensity to omit dividends.	burden and maximize after tax returns to shareholders.
Benito and Young (2003) To study the phenomena of UK firms' dividend omissions in light of financial characteristics of firms.	*Dependent Variables:* Ordinary dividends net of advance corporate taxes. *Independent Variables:* Capital stock; EBIT; Tobin Q's; Net profit + depreciation; Interest payment/profit before tax; Debt/Total Assets *Sample:* All non-financial firms listed on LSE 1974-1999. *Model:* Probit	A high level of cash flow lowers the probability of omitting dividends. The higher the leverage the higher the probability of a dividend cut or omission. The higher the investment opportunities, the higher the propensity to omit dividends.	Support for cash flow, leverage and firm growth as major determinants of dividend policy.
Farinha (2003)	*Dependent Variable:* Dividend payout ratio.	A negative relationship between firm size	Support for agency

Author(s)/ Purpose	Methodology	Findings	Conclusion
A study of the agency theory of dividend policy in the UK.	*Independent Variables:* Percentage of insider holdings; Total assets Debt/TA; Stock return volatility; Cash/TA; Shareholder dispersion; Institutional holdings; Percentage of non-executives on board; Irrevocable taxes/total assets; Log market cap; No. of analysts following a specific firm; ROA; Cadbury--a dummy equals 1 if the firm complies to best practices act; Industry dummy. *Sample:* Non-financial and non-utility firms. 693 in 1987-91 and 603 in 1992-96. *Model:* Cross-sectional regression analysis (XSRA)	and dividend payout ratio of UK firms. Firm growth is negatively correlated to dividend payout ratio. Positive correlation between institutional holdings and payout ratio. Leverage is negatively correlated to dividend payout ratio.	theory of dividends, leverage and firm growth as major dividend policy determinants.
Khan (2006) To investigate the relationship between ownership structure and dividend policy of UK firms.	*Dependent Variable:* Gross dividends *Independent Variables:* ALL INST. % of holdings by institutions (investment, banks and trusts); PEN (% of holdings by pension funds); INS % of holdings by insurance; Other INST (% of holdings by other institutions); IND (% of holdings by individuals); Top 5 (%	A negative relationship between ownership concentration and dividend policy. A positive relationship between insurance company concentration and dividend	Support for agency theory except for the case of holdings by insurance companies.

Author(s)/ Purpose	Methodology	Findings	Conclusion
	of holdings by largest 5 shareholders); Sales; Net profit after tax; Leverage (debt/total assets). *Sample:* 330 UK non-financial companies 1985-1997. *Model:* Logit	policy. Positive correlation between profitability, leverage and dividends.	

Author(s)/ Purpose	Methodology	Findings	Conclusion
Denis and Osobov (2008) To study the major determinants of dividend policy in the US, UK, Germany, France, Canada, and Japan.	*Dependent Variables:* Dependent variable equals 1 if the firm pays dividends in year t and zero otherwise. *Independent Variables:* NOPAT/Total Assets; Earnings after Taxes/Book Value of Equity: Market value of total capital[4]; Percentage change in Total Assets; Book Value of Total Assets; Contributed capital RE/BE. *Sample:* Dividend-paying firms (excluding utilities) in the six countries under study 1989-2002 with Worldscope data covering information on total assets, common equity, net income, interest expense, and either market capitalization at fiscal year-end or the number of outstanding shares and fiscal, year-end closing price. *Model:* Logit Regression	Profitability, firm size and earned contributed capital are positive determinants of dividend policy in the six countries under study. Firm growth as measured by two proxies, % change in total assets and market value of total capital, provided contradictory results among the different countries.	Support for profitability, firm size and contributed capital as major determinants of dividend policy.

[4]Growth opportunities are measured as the ratio of the market value of total capital (book value of total assets book value of equity market value of equity) to the book value of total assets.

Author(s)/ Purpose	Methodology	Findings	Conclusion
Al-Najjar and Hussainey (2009) To investigate whether the number of outsiders on the BOD and dividend payout are used as complements to minimise the agency conflict.	*Dependent Variable:* Dummy = 1 for dividend payers and 0 for non-payers *Independent Variables:* Number of outsiders; Free Cash Flow/share; Cash Flow/Total Assets; Fixed Assets Ratio; Beta; Size (natural log of Total Assets); Borrowing Ratio; Price/Book Ratio. *Sample:* 400 non-financial firms listed on London Stock Exchange 1991-2002. *Model:* Logit, Tobit	The number of outside directors on board is negatively related to dividend payout. Negative relationship between liquidity, tangible assets, beta and dividends. Insignificant relationship between growth opportunities and dividend payment. A negative but insignificant relationship between financial leverage and dividend payment.	Support for agency theory.
Al-Eisa and Hussainey (2009) To investigate the role of dividends as a signalling tool for companies with a	*Dependent Variable:* Abnormal future earnings. *Independent Variables:* Change in Dividends per share. *Sample:* Event Study of 33 non-financial UK firms (2000-2007) after a decline of their sustained earnings growth.	A negative association between dividend changes and future performance. The change in dividends is not an important signal of future prospects for firms with a declining earnings growth.	Weak Support for Dividend Signalling in firms with declining earnings growth

Author(s)/ Purpose	Methodology	Findings	Conclusion
decline in earnings growth.	*Model:* Event study-Growth Adjustment Model.		
Basiddiq and Hussainey (2010) To examine the extent to which asymmetric information is associated with dividend policy	*Dependent Variable:* Dividend Per Share (DPS) *Independent Variables:* ROE; Liquidity; (Current ratio); Log of Sales; Gearing Ratio; Growth (Price/Book (P/B)) *Sample:* A cross-section of 282 FTSE-listed companies in 2007 (excluding utilities and financial companies) *Model:* MRA (multiple regression analysis)	Profitability, growth opportunities and firm size are all determinants of UK dividend policy with varying degrees.	Support for agency theory and pecking order. No support for signalling.
Al-Najjar and Belghitar(2011) To examine the impact of systematic risk on the dividend policy of	*Dependent Variables:* Dividend yield. *Independent Variables:* Cash holdings; ROE; MB; Debt/Total Assets; ß ; Log TA. *Sample:* 400 UK non-financial firms 1991-2008.	Leverage and firms size are positively correlated to dividend yield. Growth and systematic risk are negatively correlated to dividend policy.	Support for the impact of risk on dividend policy determinants.

Author(s)/ Purpose	Methodology	Findings	Conclusion
UK firms.	*Model:* Pooled OLS and IV Estimation.		
Renneboog and Trojanowski (2011) To examine the decision to distribute funds and the payout channels in the UK.	*Dependent Variable:* Dummy variable equals 0 for non-payers, 1 for dividend payers, 2 for firms with repurchases and 3 for firms that pay dividends and repurchase shares in a particular year. *Independent Variables :*Log MC; EBIT/TA; MB; D/TA; Industry Dummy; Dummy for voting power of blockholders. *Sample:* 985 UK non-financial firms 1992-2004. *Model:* Multinomial Probit	Dividends are positively associated with profitability and firm size. Investment opportunities and leverage are negatively associated with dividends. The stronger the monitoring powers of blockholders, the lower the need for payout.	Support for firm size, profitability, investment opportunities and leverage as determinants of dividend policy.
Atieh and Hussain (2012) To examine whether	*Dependent Variable:* Change in dividends. *Independent Variables:* Total dividends in previous year, Current Earnings, Operating Cash Flow, Aggregate	Earnings and operating cash flows are significant determinants of a change in dividends for UK firms.	UK financial statements provide users with improved insights beyond the

Author(s)/ Purpose	Methodology	Findings	Conclusion
accruals data provide users of accounts with additional insights into the dividend policy of firms beyond what is conveyed by cash flow.	Accruals, Change in Inventory, Change in accounts payable, change in accounts receivable, Depreciation, Other accruals all deflated by total assets. *Sample:* All UK non-financial firms listed on LSE in the period from 1994 to 2004. *Model:* OLS		ones provided only by cash flows.
Kuo et al. (2013) To examine the determinants of dividend payout ratio and the impact of risk, liquidity and catering on the propensity to pay dividends.	*Dependent Variable:* Dummy variable equals 0 for non-payers, 1 for dividend payers. *Independent Variables:* MB, Asset Growth; Earnings/Total Assets; D/E, RE/E, Stock Liquidity, systematic risk, unsystematic risk. *Sample:* Large sample of firms 18 countries including the UK in the period from 1989-2011. *Model:* Logit	Systematic and unsystematic risks have a positive impact on the propensity to pay dividends in the UK. UK firms with high firm growth as measured by market-to-book have low propensity to pay dividends. Firm growth measured by growth of assets shows mixed evidence.	There is a negative association between firm risks both systematic and unsystematic and the propensity of UK firms to pay dividends.

Author(s)/ Purpose	**Methodology**	**Findings**	**Conclusion**
Driver et al. (2015) To investigate the dividend behaviour of firms for various sized and aged firms. It also examines the impact of the financial crisis 2008-2009 on the dividend behaviour of UK firms.	*Dependent Variable:* Cash Dividends/Total Assets *Independent Variables:* Log Earnings, MB_{t-1}, Growth of total assets $_{t-1}$, Debt/Total Assets, Age, Year, Size, Industry dividends over sales ratio (CAT), Crisis*MB, Crisis*Earnings, Crisis*Leverage, Crisis*Size, Crisis*Growth of Total Assets, Crisis* CAT *Sample:* All UK public companies in the period from 1997 to 2012. *Model:* OLS	Earnings, market-to-book and size matter more for dividend paying firms. Leverage is negative for large and young firms. Investment opportunities have little impact on dividends during the financial crisis. There is lower need for cash for expansion during the financial crisis.	There is reported heterogeneity in the dividend behaviour of firms across groupings by size, age and industry. There is a minimal impact on the crisis on the dividend policy of UK firms. The life cycle theory of dividends applies only to young firms.
Geiler and Renneboog (2015)	*Dependent Variable :*Dividends per Share-Share Repurchases	Firms with high market to book ratios and large investment opportunities pay higher	No support for the pecking order

Author(s)/ Purpose	Methodology	Findings	Conclusion
To study the impact of taxation on the payout channel of UK firms.	*Independent Variables:* Taxation variables, ownership variables, Remuneration variables, Sentiment variables, FCF/Total Assets, Market-to-Book, ROA, Board Size, CEO gender, CEO Age, CEO tenure, Variance of Cash flow per share, Female percentage, Dividend Surprise (difference between actual dividends paid and estimated 12-month forward dividend. *Sample:*1906 UK firms listed on AIM from 1997-2007. *Model:* OLS	dividends over earnings retention. Individuals have preference for no payouts or dividends over share repurchases. Pension funds are neutral to dividend payouts after the year 1999. Profitable cash rich firms favour share repurchases over dividends.	hypothesis. No evidence for tax-induced clientele effects for corporate investors.

2.5 Chapter Summary

This chapter presents an overview of the literature review on dividend policy relevant to the current study. The main arguments that pertain to the theories of interest are discussed. Those theories are: the agency theory and free cash flow hypothesis, the life cycle and signalling theories, the tax, clientele and residual theories. The empirical evidence on dividend policy theories and determinants of dividend payouts presented throughout the chapter appear diverse across different countries and time periods.

The studies on dividend policy in the UK show mixed evidence as to the applicability of the various dividend theories. As per dividend policy determinants, it is evident that unsystematic risk is scarcely examined as a determinant of dividend payout in the UK. Therefore, the current study will focus on the role of systematic and unsystematic risks and their impact on shaping the dividend payout ratio in the UK.

Appendix (2.1): Lintner's Partial Adjustment Model

Lintner (1956) investigates dividend policy by interviewing managers selected from 28 companies. He reports a number of important facts that underlie the dividend payment decision of firms. First, firms have long term target payout ratios. Second, managers focus on a change in dividends rather than dividends in absolute terms. Third, dividend changes depend on long term sustainable levels of earnings. Fourth, managers are reluctant to make shifts in dividends that could be irreversible.

Based on the above results, Lintner (1956) built up the following theoretical model for the explanation of the dividend behaviour of firms.

$DPS_{*} = \gamma \times EPS$(1)

$DPS_{t} - DPS_{t-1} = (DPS_{*} - DPS_{t-1})$ (2)

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

where γ is the target payout ratio, λ is the speed of adjustment towards the target payout ratio that reveals how quickly managers adjust to the target payout through time, α is a constant expected to be positive to reflect the propensity of firms not to cut their dividends. DPS and EPS stand for dividend per share and earnings per share, respectively.

Equation (1) shows that the target dividend is a function of the target payout ratio as indicated by survey results. Equation (2) indicates that a change in dividends reflects the difference between target levels of dividends and actual dividends paid by the firm. The target payout ratio is the long-term target ratio of dividends to earnings. By rearranging equation (2) we arrive at equation (3) that 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. In this respect, the model predicts that dividends at time *t* are a function of earnings at time *t*, lagged dividends, target payout ratio and speed of adjustment.

In the mathematical model employed in the study, the relationship between current actual dividends per share and previous period's dividends per share is derived from equation (3) above.

According to Lintner (1952), the change in dividends should reflect the difference between target dividends and previous period's dividends. Since firms are likely to smooth their dividends from year to year it then follows that observed and lagged dividends per share are positively associated. This model was empirically proven by Allen and Michaely (2003) and Allen et al. (2000).

CHAPTER 3

UK DIVIDEND PRACTICE

INTRODUCTION

This chapter presents an overview of the dividend practice in the UK including the rules that govern the distribution of profits, dividend taxation laws as well as a synopsis on UK dividend trends over a twenty-four year period from 1991 to 2014.

The chapter starts by a review of the sections related to the distribution of earnings under the Companies Act 2006, the act of the Parliament of the United Kingdom that forms the primary source of company law. This section provides an overview of the definition of a distribution, the factors that shape the dividend decision of managers and points out to the difference between legal and illegal dividends.

The following section (3.2) offers a summary of the different tax systems employed in the UK starting by the classical tax systems in 1965 followed by the imputation tax system employed in 1973. The section highlights the treatment of dividends under the two regimes as well as the amendments to the imputation tax system implemented over time.

The final section (3.3) provides an overview of dividend trends in the UK in the period from 1991 to 2014. This includes the change in the number of dividend-paying firms, total dividends paid by UK companies, the relationship between dividend yield and inflation and dividend payout ratio versus growth in net fixed assets.

3.1 Companies Act 2006

According to Companies Act 2006 (CA 2006 (s829)), a distribution means every description of a distribution of the company's assets to its members whether in cash or other forms. This excludes bonus shares, a reduction of share capital, a redemption or purchase of company's share out of its own capital or a distribution of assets to shareholders on a company's winding up.

The UK Companies Act of 2006 in section 830 stipulates that a company "may only make a distribution out of profits available for the purpose". Profits are basically determined as accumulated realized profits less accumulated realized losses in accordance with generally accepted accounting principles. This inherently implies that any dividend paid in excess of retained profit or paid out of capital or debt is considered "ultra vires" or illegal. It is directors' responsibility to safeguard companies' assets and ensure that the company is in a position to settle its debts as they become due. Hence, they should accurately assess the solvency of the company following a proposed distribution.

In public companies, it is a usual practice for directors to declare and pay an interim dividend (where an interim dividend is a dividend paid between annual general meetings). Interim dividends are based on company accounts for the first six months of its fiscal year. The directors will then recommend a final dividend to the annual general meeting based on the profits attained throughout the full financial year. The dividends are declared based on relevant accounts; that are the audited financial accounts for the financial year. A dividend must not be declared unless a recommendation is made by directors as to the amount to be paid that should not be exceeded.

Worsening trading performance has led to more illegal dividends being paid, a fact that has been augmented by the introduction of the 50% tax band. The new 50% tax rate, effective since April 2010, has pushed more successful companies to make large one off dividend payments prior to April 2010. This one large dividend payment attempted to avoid paying 50% tax on income exceeding £150,000.

Under section 172 of UK Companies Act 2006, it is the duty of directors to promote the success of the company. Consequently, directors need to set that fraction of profits distributable to shareholders for the benefit of its members as a whole. In this instance, directors should ensure that the capital base of the company is maintained, and not depleted by an imprudent distribution decision, satisfy the ongoing capital needs of the company through sufficient retained earnings and other equity reserves, ensure the standard and restrictive covenants are not violated, and maintain adequate levels of liquidity and solvency for the business cycle of the company (Paulo, 2010).

The decision to distribute all, some, or none of distributable profit in a manner that maximizes shareholders' wealth is guided by financial management theory and the relationship between dividend policy and shareholder value (Brigham & Gapenski, 2002, pp. 424-426). Under section 471 of UK Companies Act 2006, directors must report shareholder return, which comprises income in the form of dividend distributions, capital gains or losses that represents part of an annual business review that helps shareholders assess how directors have acted to promote the success of the company.

3.2 UK Dividend Taxation

The corporation tax system introduced in 1965 was a 'classical system'. Under such a system the total tax is the sum of the corporation tax, the effective capital gains tax and the tax on dividends. The unfavourable tax treatment for dividends as compared to capital gain income encouraged companies to reinvest their profit in the business as investors prefer to acquire their income in the form of capital gain being subject to lower or deferred taxation.

Starting April 1973, corporation tax was modified to a partial imputation system in which the company is charged to corporate tax on all its distributed and undistributed profits, while income tax is not deducted at source from dividends paid to shareholders. In this respect, the total tax is equal to corporation tax plus effective capital gain tax plus the reduced dividend tax. In case the decrease in dividend taxation is large enough to make the dividend tax lower than effective tax on capital gain, there is an incentive to increase dividend payout (Lasfer, 1996).

Between April 1973 and July 1997, this partial imputation tax system provided dividend tax credits for domestic shareholders against their personal income tax that is set against the corporate income tax paid by UK firms.

Initially dividend tax credits were financed by Advanced Corporation Tax (ACT) that is a tax paid by firms on distributed profit at a rate of 20% (imputation rate) after having paid out the dividends. In this respect, the shareholder who receives the net cash dividend also receives a tax credit (equal to the basic rate of income tax on dividends) that is used to offset his income tax liability (Short et al., 2002). For example, if a shareholder received a net cash dividend of £1, a tax credit of 20% of the gross dividend (net dividend plus tax credit) was paid to the shareholder. For the majority of firms this tax represents a pre-payment of the corporate income tax that could be reclaimed a few months later at the time the annual mainstream corporation tax is paid. Individual shareholders would receive a tax credit equal to the ACT tax paid on distributed profits and their dividend would be subject to their personal income tax schedule. This results in both retained and distributed profits being taxed at the corporate income tax rate for basic-rate taxpayers. Tax-exempt entities, such as pension funds, would receive a cash refund of tax credits from the tax authorities, even though they are not subject to taxation. For instance, a net £1 dividend for tax-exempt shareholders would be worth £1.25. Hence, dividends received by those entities were taxed at a lower rate than that of the corporate income tax 16.25% in 1996. This system was more favourable to dividend distribution over retained profits (Maffini, 2013).

This system adversely affected companies whose dividend payments were high relative to their UK taxable profits (in particular multinational companies) leading to deferred recovery of their ACT payments. Thus, ACT represented an additional tax levied on those firms (Bond et al., 2005).

Starting July, 1994 a special new class of dividend payment was introduced with a different tax treatment. Firms generating profits from foreign operations were allowed to pay Foreign Income Dividends (FIDs). Advanced income tax paid on FIDs could be reclaimed in the same year of the dividend payment irrespective of the level of UK profits. This represents a tax saving for this class of companies has the recovery of their ACT payments being deferred under ordinary dividend payment (Bond et al., 2005).

A tax reform initiated in 1997 preserved the general imputation tax system yet withdrew the right of tax-exempt shareholders to claim dividend tax credits. Therefore, the value of dividend income for tax-exempt shareholders was reduced by 20% that should leave them indifferent between dividends and retained earnings (Bell & Jeckinson, 2002).

The abolition of Advanced Corporation Tax (ACT) was effective starting April, 1999. Starting this date dividend income became subject to lower tax rates as compared to other sources of income. The imputation rate was reduced from 20% to 10% that is lower than the corporate income tax rate[5]. Consequently, the tax rate on dividend income for UK individual investors in high tax brackets was reduced from 40% to 32.5% which reduced the impact of dividend imputation (Renneboog & Trojanowski, 2011). This led to an overall effective 25% tax rate for taxpayers in higher brackets (after setting this "notional" tax credit against the tax liability). Starting April 2010, the top rate of income tax on dividends was 42.5% (effective rate 36.11%). By contrast with taxpayers, non-taxpayers were no longer able to claim this amount from the treasury and the 20% ACT (which would have previously been deducted from the dividend before payment) was no longer levied. This implies that only a fraction of the firm's corporate income tax is considered as an advanced payment of the shareholder's income tax. In this respect, the residual corporate income tax is an additional level of taxation, as under a classical system.

3.3 UK Dividend Policy Trends

The number of UK dividend-paying firms shows an increasing trend from 427 to 669 in 1991 and 1995, respectively. Over the twenty-four year period the number of dividend-paying firms decreased to 365 in 2001. The drop could be due to the severe stock market downturn caused by the burst of a technology bubble that started in the year 2000 (Renneboog and Trojanowski, 2011). The second decrease corresponds to the global financial crisis of 2008-

[5]*Note*: The corporate statutory tax rate was 33% in 1996, 31% in 1997, 30% in 1999, and 28% in 2010. The basic rate of personal income tax was 20% and the higher rate was 40% in 1997 and 1999. The basic rate for dividends was 10% and the higher rate was 32.5% from 1999 onwards. An additional rate of 42.5% was introduced in 2010 for taxpayers with income above £150,000. The imputation rate was 20 % until 1998 and 10% from 1999 onwards.

2009. The overall trend corresponds to a decline in the number of dividend paying firms starting the year 2003 reaching 225 companies by 2014.

The following table presents the number of UK dividend-paying firms in the period 1991-2014.

Table 3-1: Number of UK Dividend-Paying Firms in the Period 1991-2014

Year	No. of UK Dividend Paying Firms
1991	427
1992	554
1993	586
1994	636
1995	669
1996	639
1997	643
1998	608
1999	544
2000	441
2001	365
2002	400
2003	332
2004	315
2005	244
2006	342
2007	326
2008	220
2009	208
2010	252
2011	265
2012	259
2013	241
2014	225

Source: Datastream

The initial amount of total dividends paid by UK firms shows an increasing trend from £8.7 billion in 1991 to £18.2 billion in 1997. The decline in total real dividends paid to £16.3 billion in 1998, may be attributable to the tax reform of 1997 that reduced the value of dividends to the tax-exempt investor. Total dividends reached a minimum of £10.6 billion in

2001. The researcher argues that this decline may have resulted from the downturn caused by the burst of the technology bubble. Starting 2002, UK firms increased total real dividends to reach a peak of ₤78.6 billion in 2007. Later, real dividends dropped sharply to ₤32.7 and ₤9.5 billion in 2008 and 2009, respectively coinciding with the financial crisis. In general, the trend shows a decrease in the number of dividend paying firms over the twenty-four year period of the study and an increase in real dividends paid prior to the global financial crisis.

The following table presents the total amount of dividends paid by UK companies in the period 1991-2014.

Table 3-2: Total Amount of Dividends Paid by UK Firms in the Period 1991-2014

Year	TOTAL DIVIDENDS (₤bn)
1991	8.68
1992	10.94
1993	13.43
1994	15.77
1995	16.09
1996	18.14
1997	18.19
1998	16.30
1999	15.42
2000	13.02
2001	10.59
2002	34.84
2003	38.33
2004	48.85
2005	50.20
2006	72.69
2007	78.66
2008	32.73
2009	9.54
2010	29.39
2011	30.00
2012	24.32
2013	23.56
2014	23.64

Source: Datastream

The hypothetical relationship between dividend yield and inflation is expected to follow a positive trend. According to the so-called Fed model, the yield on stocks (as measured by the ratio of dividends or earnings to stock prices) is positively associated with the nominal yield on treasury bonds after adjusting for the relative risk on stocks and bonds. This is based on the idea that for stocks to remain competitive, a higher nominal yield on treasury bonds should raise the risk-adjusted yield on stocks (Campbell and Vuolteenaho, 2004a,b). Consequently, nominal bond yield and dividend yield should move together. Moreover, since historically the main influence on nominal bond yield was inflation it follows that according to the Fed model dividend yield should be positively correlated with the inflation rate.

The following **Tables, 3-3 and 3-4** present the trends in dividend yield versus inflation in addition to changes in dividend yield versus changes in inflation in the UK over the period 1991-2014, respectively. It is obvious that the relationship between dividend yield and inflation followed a positive trend over the twenty-four year period of the study similar to evidence from the US market (Campbell & Vuolteenaho, 2004a, b).

Table 3-3: UK Average Dividend Yield and Inflation, 1991-2014

Year	UK Dividend Yield	Inflation
1991	5.69%	7.21%
1992	4.82%	2.54%
1993	3.51%	2.48%
1994	3.71%	2.05%
1995	4.57%	2.96%
1996	4.94%	2.30%
1997	4.86%	1.69%
1998	5.39%	1.55%
1999	4.85%	1.20%
2000	4.28%	0.75%
2001	4.13%	1.07%
2002	4.10%	1.69%
2003	3.75%	1.25%
2004	4.07%	1.64%
2005	3.86%	1.92%
2006	3.22%	2.97%

Year	UK Dividend Yield	Inflation
2007	4.32%	2.12%
2008	5.47%	3.11%
2009	2.68%	2.83%
2010	2.59%	3.73%
2011	3.36%	4.20%
2012	2.65%	2.71%
2013	2.55%	1.99%
2014	2.35%	0.50%

Source: www.inflation.eu & Datastream

The following table presents the change in UK dividend yield and associated change in inflation in the period 1992-2014.

Table 3-4: Change in UK Average Dividend Yield versus Change in Inflation in the period 1992-2014.

Year	Change in Dividend Yield	Change in Inflation
1992	-15.29%	-64.77%
1993	-27.18%	-2.36%
1994	5.7%	-17.34%
1995	23.18%	44.39%
1996	8.1%	-22.30%
1997	-1.62%	-26.52%
1998	10.91%	-8.28%
1999	-10.02%	-22.58%
2000	-11.75%	-37.5%
2001	-3.5%	42.67%
2002	-0.73%	57.94%
2003	-8.54%	-26.04%
2004	8.53%	31.20%
2005	-5.16%	17.07%
2006	-16.58%	54.69%
2007	34.16%	-28.62%
2008	26.62%	46.70%
2009	-51.01%	-9.00%

Year	Change in Dividend Yield	Change in Inflation
2010	-3.36%	31.80%
2011	29.73%	12.60%
2012	-21.13%	-35.48%
2013	-3.77%	-26.57%
2014	-7.84%	-74.87%

Source: www.inflation.eu & Datastream

The following table presents the annual change in average net fixed assets and dividend payout ratio.

Table 3-5: Change in Average Net Fixed Assets (NFA) and UK Dividend Payout Ratio, 1992-2014

Year	NFA Growth	Dividend Payout Ratio
1992	10.07%	34.99%
1993	11.55%	35.29%
1994	0.64%	31.87%
1995	0.96%	32.41%
1996	8.58%	32.56%
1997	4.53%	34.65%
1998	-2.15%	33.00%
1999	13.81%	30.27%
2000	9.37%	27.68%
2001	-14.18%	27.52%
2002	65.48%	30.80%
2003	34.85%	26.44%
2004	0.62%	31.76%
2005	21.71%	25.65%
2006	-17.80%	24.65%
2007	-1.92%	24.96%
2008	-52.66%	22.62%
2009	-37.82%	26.02%
2010	65.99%	24.31%
2011	4.55%	27.46%
2012	-7.40%	28.84%
2013	-21.08%	32.31%
2014	18.12%	33.64%

Source: Datastream

The results presented in **Table 3-5** show that the average dividend payout ratio of UK firms in the period 1992-1997 is 33.63%. The decline in total real dividends paid in the period 1998-2001 (refer to table 3.2) coincides with the decline in average dividend payout ratio to 29.6% over the same period. UK firms report the minimum average dividend payout ratio measured at 24.32% during the financial crisis 2008-2009. The above table also presents the relationship between the growth in net fixed assets and dividend payout ratio of UK companies in the period from 1992 to 2014. It is evident that there is a direct relationship between the growth in net fixed assets and dividend payout ratio. This could be explained as an increase in net fixed assets facilitating the access of firms to public markets. Therefore, firms could increase their dividend payouts as they have easier access to external financing (Allen & Michaely, 2003; Aivazian et al., 2003). This relationship is consistent with evidence from other Eurozone countries that prove a positive association between tangible fixed assets and dividend payout (Neves et al., 2006).

3.4 Chapter Summary

The distribution of earnings in the UK is guided by the Companies Act 2006. According to this act, the goal of managers is to promote the success of companies and managers need to report the annual return to shareholders that could be in the form of dividends, capital gains or losses. The legal dividend is the distribution paid out of profits. However, if dividends exceed the capital or accumulated retained earnings or if a dividend is paid out of debt, it is considered illegal.

In the UK dividends are subject to taxation under the imputation tax system employed since 1973. The system witnessed a number of amendments one in 1999 where the advance corporate taxation (ACT) was abolished and the tax credit on dividends was reduced to 10%.At the same time, the basic income tax rate on dividends was also reduced to 10% while a new higher-rate of 32.5% was introduced. This led to an overall effective 25% tax rate for taxpayers in higher brackets (after setting this “notional” tax credit against the tax liability). Starting April 2010, the top rate of income tax on dividends was 42.5% (effective rate 36.11%). Unlike taxpayers, non-taxpayers were no longer able to claim this amount from the treasury and the 20% ACT (which would have previously been deducted from the dividend before payment) was no longer levied.

The overall trend shows a decrease in the number of UK dividend paying firms despite an increase in the amount of dividends paid by UK companies from the mid-nineties till the outbreak of the financial crisis. The average dividend payout ratio dropped from an average of 34% in the nineties reaching a minimum of 24% during the global financial crisis 2008-2009.

CHAPTER 4

RESEARCH METHODOLOGY

INTRODUCTION

This chapter provides a discussion of the methodological approach employed in this study that attempts to investigate the dividend policy of UK firms, namely, a panel data methodology. One of the main aims of this research is to assess the impact of firm risk, both systematic and unsystematic, on the dividend policy of UK firms. The complexity of dividend policy stems from the potential interaction between determinants of the dividend payout ratio and each of systematic and unsystematic risk. The period of the study extends from 1991 to 2014, a period that includes the burst of the dot-com bubble in 2001 and the financial crisis of 2008-2009.

Section 4.1 offers a review of the relevant literature and the development of hypotheses pertaining to all explanatory variables. Section 4.2 gives an account of the description of the data. This includes the explanatory variables that embody various measures of corporate dividend policy determinants, in addition to other proxies that measure the applicability of various theories of relevance to UK dividend policy. This section also discusses the empirical model, including the list of explanatory variables used in the study, their measurement, and hypotheses regarding the relationship between each variable and the dividend payout ratio.

The remainder of the chapter is organized as follows: Section 4.3 presents the data used in this study, with a general discussion of the data sources and a sample description including sample size, sample period, the division of the sample by sector, and the sample selection criteria employed in the study. Section 4.4 sheds light on the concept of panel data, with an explanation of the nature of panel data, its characteristics including the advantages and disadvantages of using it, econometric models of panel data, panel data assumptions and the tests required to assess those assumptions. Section 4.5 provides an explanation of the panel data model estimation used in this research, that is, the generalized method of moments

(GMM), which is selected to deal with the issue of endogeneity that is common in panel data. Sections 4.6 and 4.7 present an overview of the panel data tests and multiple regression analysis respectively.

4.1 Hypothesis Development

In this section, empirical evidence on the major determinants of dividend policy is summarized, with an emphasis on firm risks, both systematic and unsystematic. Theories concerning dividend policy that are of relevance to this study, namely, life cycle and agency theories, the free cash flow hypothesis and transaction cost theory, are summarized and contrasted. The theoretical links between the various theories and dividend policy determinants are clarified so as to develop testable hypotheses.

4.1.1 Firm Risk

The literature on dividend policy focuses primarily on systematic risk and its impact on dividend policy, based on the notion that investors hold well-diversified portfolios that render unsystematic risk insignificant. Empirical evidence on dividend policy shows a significantly negative impact of firm risk, specifically systematic risk, on dividend payouts. Survey results indicate that managers view an increase in dividend payout to be attributed to a decline in firm risk (Brav et al., 2005; Dong et al., 2005). Other studies, including Hoberg and Prabhala (2009) and Kuo et al. (2013), find that an escalation in unsystematic risk is associated with the disappearing dividend phenomenon. Similarly, Baum et al. (2006) highlight the fact that firms with higher unsystematic risk tend to hold more liquid assets such as cash, which increases the probability of reduced payouts. Chay and Suh (2009) report a negative effect of stock return volatility on the decision to pay dividends.

The role of systematic risk in shaping the dividend policy of firms is explained in the context of signalling. This implies that firms use their dividend policy to signal a change in their risk state by increasing dividends in the case of a decline in risk and vice versa (Eades, 1982). Likewise, Pettit (1977) proves that firms with high systematic risk have lower dividend yields. He argues that a change in systematic risk is one of the main reasons behind the difference between actual and projected earnings levels. Prior evidence provided by Rozeff (1982), Lloyd et al. (1985) and Grullon et al. (2002) shows a decrease in dividend payout ratio to be caused by a drop in corporate earnings. Chang and Rhee (1990) prove that a decline in earnings drives firm risk to increase, thus lowering firms' propensity to pay dividends. Similarly, cash flow shortages are associated with increased risk and reduce firms' dividend-paying capacity (Schooley and Barney, 1994; Ferreira and Vilela, 2004; Al-Najjar and Belghitar, 2011).

The relationship between firm risk and signalling is also explained from the perspective of a firm's life cycle. Malkiel and Xu (2003) argue that unsystematic risk is usually coupled with greater future growth. This usually occurs at earlier stages of a firm's life cycle. In this phase, a firm will prioritize its investment needs over dividend payouts. Lin et al. (2016) report an inverse relationship between unsystematic risk and dividend payout ratio, which they attribute to a decline in firms' investment opportunities associated with their entering the mature phase of their life cycle. Accordingly, firms payout a larger portion of their earnings as dividends to signal better future performance. An alternative explanation is proposed by Blau and Fuller (2008), who find that dividends increase significantly when stock prices are lower. They also prove that, as the risk of an investment increases, the dividend payment decreases. This creates a positive relationship between the firm's stock price and its unsystematic risk, arising from the endogenous dependence of dividends on stock prices and the endogenous relationship between dividend policy and unsystematic risk.

Another explanation for the negative impacts of both systematic and unsystematic risks on dividend policy is presented by Lee et al. (2011) in a theoretical model. They prove that the optimal dividend payout ratio is negatively (positively) associated with total risk when the growth rate of the firm is higher (lower) than the rate of return on assets. This indicates that high-growth firms pay dividends due to flexibility considerations, whereas low-growth firms pay dividends to avoid agency costs associated with excessive free cash flow. Information asymmetry problems offer another plausible explanation for the relationship between firm risk and dividend payouts. The role of institutional ownership in minimizing agency problems can be described from a risk perspective. Hutchinson et al. (2015) prove that a high level of ownership by institutional investors mitigates the impact of unsystematic risk and show a positive association with firm performance as measured by the return on assets. Excess free cash flow is associated with low firm risk yet higher agency problems. Bhattacharya et al. (2015) examine the interaction effect of free cash flow and unsystematic risk on the dividend payout ratio. They report that firms with high unsystematic risk suffer from underinvestment problems. Therefore, such firms refrain from dividend payments so as to direct the cash flows towards satisfying their investment needs.

The relationship between dividend policy and financial leverage can be explained from a risk perspective. Eades (1982) argues that systematic risk incorporates financial leverage. The higher the financial leverage of firms, the higher is the beta of the stock, reflecting higher costs of external borrowing. It then follows that firms with high levels of systematic risk pay lower dividends to minimize the cost of external financing. Empirical evidence provided by Grullon et al. (2002) proves that a decrease in dividend payout is associated with an increase in systematic risk. They argue that a rise in systematic risk is caused by a decline in profitability and/or an increase in financial leverage.

According to transaction cost theory, large-sized, more profitable firms have lower levels of risk. This translates into low transaction costs and low costs of raising funds externally through equity. Consequently, large-sized firms can pay high dividends and raise the funds they need externally.

Based on the above, the following hypotheses are testable:

H1: There is a negative association between the dividend payout ratio and each of systematic and unsystematic risk.

H2: There is a negative association between the dividend payout ratio and the interaction between firm risks and determinants of the dividend payout ratio.

4.1.2 Profitability

Profitability is regarded as one of the primary drivers of dividend policy. This evidence dates back to Lintner (1956), who reports that managers rely on current and projected future earnings in setting current dividends. In addition, there is a tendency among firms to smooth dividends based primarily on earnings. Baker and Powell (2000) report that anticipated future earnings are the major determinant of dividend policy for NYSE-listed firms. This is based on evidence from surveys and field interviews. Fama and French (2001) prove that dividend payers have higher profitability than non-payers, among AMEX, NASDAQ and NYSE-listed firms. Similarly, De Angelo et al. (2004) find a strong association between the concentration of dividends and the concentration of earnings, since firms that generate the majority of earnings appear to dominate the dividend supply. Goergen et al. (2005), Brockman and Unlu (2011), and Kuo et al. (2013)prove that net profitability is a major determinant of dividend changes. According to Jensen et al. (1992) and Aivazian et al. (2003), there is a pronounced positive association between profitability and dividend policy.

The resulting testable hypothesis is as follows:

H2: There is a positive association between profitability and the dividend payout ratio.

4.1.3 Cash Flow

The free cash flow hypothesis posits that firms with excess free cash flow that exceeds their current investment needs have a preference for making high dividend payments. Since the dividend payment reduces the surplus cash flow kept at the discretion of the managers, this helps avoid suboptimal investment, aligns the goals of the managers with those of the shareholders, and consequently minimizes agency conflict (Jensen, 1986). Likewise, the supply of larger dividends by cash-rich firms is an accepted notion, since dividends are paid out of excess cash flow after satisfying working capital and capital expenditure requirements. In this instance, cash flow is as strong as earnings in shaping dividend policy (Goergen et al., 2005). Empirical evidence reveals that firms generate sufficient operating cash flows to honour pre-committed levels of dividends (Amidu and Abor, 2010). Consequently, firms with higher levels of free cash flow are expected to pay more dividends in the form of cash. Holder et al. (1998) and Lee et al. (2011) prove that higher free cash flow is associated with larger dividend payouts. Similarly, Atieh and Hussain (2012) report a consistently positive and significant relationship between operating cash flow and cash dividends for UK firms. The corresponding testable hypothesis is as follows:

H3: There is a positive association between the dividend payout ratio and cash flow.

4.1.4 Liquidity

The disappearing dividend phenomenon is studied by Fama and French (2001) and Banyi and Kahl (2014), who prove that firms with increased cash holdings have a lower propensity to pay dividends. They attribute this evidence to changes in firm characteristics, such as an increase in unsystematic risk, coupled with the tendency of firms to hold smaller inventories and fewer receivables (Bates, 2009). In this respect, firms preserve their cash holdings for precautionary reasons. Blau and Fuller (2008) prove that firms with high liquidity holdings have lower dividend payout ratios and dividend yields, in order to maintain their financial flexibility, in line with Ma (2012) who reports similar evidence for the UK.

The agency theory of dividends could explain the tendency of low-liquidity firms to have higher payout ratios. Jordan et al. (2014) prove that firms with low liquidity and few investment opportunities have high payout ratios since they rely on dividends as a pre-commitment device that helps them to minimize agency-related problems. The preceding results lead us to test the following hypothesis:

H4: There is a negative association between liquidity and the dividend payout ratio.

4.1.5 Earned Capital

The life cycle theory of dividends proposes that the dividend policy of a firm changes across different stages of a firm's life cycle. According to DeAngelo et al. (2006), the theory combines elements of the agency theory presented by Jensen (1986) and the concept of the investment opportunity set discussed by Fama and French (2001) and Grullon et al. (2002). In this respect, firms are expected to optimally shape their dividend payment pattern over time in response to available investment opportunities. Therefore, young firms pay out less in dividends because their investment opportunities exceed their internally generated funds. In later years, when cash flow from operations exceeds profitable investment opportunities, a value-maximizing firm is expected to distribute its earnings to shareholders to mitigate the wasting of available free cash flows and to minimize agency problems. Based on this view, mature firms have excess retained earnings and hence show a higher probability of making dividend payments. Denis and Osobov (2008) report that the fraction of firms that pay dividends is high when retained earnings constitute a large portion of firms' equity, and low when retained earnings are negative. Other studies prove a substantial increase in the propensity to pay dividends proportionate to an increase in earned capital (Brockman and Unlu, 2011; Kuo et al., 2013; Banyi and Kahl, 2014). Likewise, Hauser (2013) reports an increase in the amount of dividends paid as the amount of retained earnings increases. This leads to the following hypothesis:

H5: There is a positive association between earned capital and the dividend payout ratio.

4.1.6 Firm Growth

The life cycle theory of dividends takes into account firm growth in the early stages of a firm's life cycle; investment opportunities are plentiful, while cash flows and internally generated funds are tight. In this respect, firms with strong growth opportunities are not expected to pay high dividends. Furthermore, Farinha (2003) suggests that growth opportunities can render the dividend policy less relevant, given that growth may induce external fund raising. Ferreira and Vilela (2004) argue that firms with ample growth opportunities retain cash for long-term investment and hence pay no or low dividends. Rapp et al. (2014) prove that the accumulation of retained earnings is associated with slower growth opportunities that encourage companies to expel their excess cash flows in the form of dividends. Fama and French (2001) find evidence proving non-payers of dividends to have the largest growth opportunities. Farinha (2003) and Al-Najjar and Belghitar (2011) prove that dividends and investment decisions are not independent but rather negatively associated. Similar results are reported by Baker et al. (2013) and Bildiq et al. (2015) who prove that large-sized firms with fewer growth opportunities have a higher propensity to pay dividends. The aforementioned relationship between dividend payout and growth opportunities does not hold across all countries. For instance, Denis and Osobov (2008) show that firms with minimal growth opportunities in Canada, the UK and the US have a higher propensity to pay dividends, whereas evidence from France, Germany, and Japan provides mixed results. Empirical evidence from the UK shows that firm growth and dividend policy are positively associated, which could be explained by the fact that firms with strong growth potential, as measured by growth of sales, growth of total assets, and the market-to-book ratio, are mostly large-sized, profitable firms that can accommodate dividend payments in parallel with financing necessary investments (Basiddiq and Hussainey, 2010).Based on the financial life cycle of dividends, the following hypothesis is testable:

H6: There is a negative association between the dividend payout ratio and firm growth.

4.1.7 Leverage

Debt and dividend payments can be effective substitutes for minimizing the agency costs of free cash flow. As compared to dividend payments, debt represents a stronger commitment by firms to pay out future cash flows, since firms would face lawsuits in the event of defaulting on interest and principal payments (Jensen, 1986). In the same vein, an increase in indebtedness is associated with higher interest payments in addition to debt covenants and other restrictions imposed by debt holders, and these are expected to lower dividend payments. Empirical evidence demonstrates an association between a decline in the propensity to pay dividends and an incline in leverage (Benito and Young, 2003; Farinha 2003; Harada and Nguyen, 2011; Renneboog and Trojanowski, 2011). Contrary to the above evidence, a number of studies report that the debt ratios of dividend-initiating firms are on average significantly higher than those of non-dividend-initiating firms (Kale et al., 2012). This could be explained by the argument of Eije and Megginson (2008) that high debt levels are characteristic of mature firms, a fact that would imply a positive association between the debt ratio and the dividend policy according to the life cycle hypothesis. Another possible explanation for the positive association between dividend policy and financial leverage is provided by the flexibility hypothesis (Blau and Fuller, 2008). This hypothesis stipulates that firm with low debt levels favour flexibility, causing them to refrain from making high dividend payments so as to preserve their cash flows for investment in projects they consider to be value maximizing. The above results help set up the testable hypothesis that follows:

H7: UK firms follow the flexibility hypothesis in setting their payout ratios.

4.1.8 Institutional Ownership

The agency theory states that firms suffer from a conflict of interests between the shareholders who are the firms' owners and the managers hired to run their operations. In this respect, managers may pursue their personal goals at the expense of the goals of the firm, thus engaging in activities that are detrimental to the value of the firm. According to Rozeff (1982) and Easterbrook (1984), dividends are considered to be one of the tools used to minimize equity agency costs by reducing the discretionary funds available to managers. Jensen et al. (1992), Alli et al. (1993), and Mollah et al. (2000) argue that dividend payment leads to a more frequent reliance of the management on the capital markets to raise funds, thus increasing the discipline of managers, aligning their goals with those of the stockholders and reducing the cost of monitoring them.

Consistent with the agency theory is the free cash flow hypothesis presented by Jensen (1986), who argues that managers of firms with substantial cash flows will tend to overinvest by accepting projects that might have negative net present value (NPV). This leads to a conflict of interests between the managers and shareholders. The problem is how to motivate managers to expel the cash rather than invest it at below the cost of capital or waste it on organizational inefficiencies. However, Jensen (1986) argues that an increase in dividends (all other things held constant) will decrease suboptimal overinvestment and increase the value of the firm, while a decrease in dividends is likely to produce the opposite result. In this respect, the optimal level of dividends is a trade-off between an attempt to control the agency conflict of overinvestment and leaving sufficient funds for managers to pursue positive-NPV projects.

Farinha (2003) and D'Souza and Saxena (1999) use ownership by institutional investors as a proxy for agency conflict. This is based on the perception that institutional ownership acts as a substitute for dividends by exerting a strong monitoring mechanism over firms, thus reducing the need to dissipate cash to avoid overinvestment by management. They document an inverse relationship between dividend policy and the percentage of institutional ownership. The following testable hypothesis can be suggested:

H8: There is a negative association between the percentage of institutional ownership and the dividend payout ratio.

4.1.9 Insider Ownership

The amount of stock held by insiders/managers is considered a factor that could affect the dividend payout ratios of firms in light of the agency theory of dividends. Rozeff (1982) finds evidence that the payout ratios of firms increase when insiders hold a low fraction of equity relative to outsiders. This indicates that problems of information asymmetry are higher with low insider ownership. Consequently, dividends act as a substitute for insider ownership. Similarly, other researchers report a decrease in dividend payouts (Jensen, 1992; Chay and Suh, 2009) and the amount of dividends paid (Eckbo and Verma, 1994; Florackis et al., 2015) linked to an increase in insider ownership. This supports the notion that an increase in insider ownership leads to a decrease in agency costs since managers bear more of the costs and are insulated from external disciplining forces. The consequent testable hypothesis is as follows:

H9: There is a negative association between the percentage of insider ownership and the dividend payout ratio.

4.1.10 Corporate Taxation

The impact of the corporate tax rate on the dividend policy is indirectly inferred as showing that an increase in corporate tax depresses after-tax profits. According to Lintner (1956) and Singhania (2006), profitability and dividend policy are hypothesized to be positively associated. It then follows that an increase in the corporate tax rate is likely to reduce the capacity of firms to pay dividends. Following the same line of thought, Chetty and Saez (2010) suggest that managers who place more weight on profit maximization, either because they own a large number of shares or due to the presence of large shareholders, tend to increase dividends following a tax cut. According to Bond et al. (2005), an increase in the tax rate should be followed by a long-run reduction in dividend payments since interest payments are tax-deductible while dividends are not. This creates a preference for debt over equity financing at the corporate level, in anticipation of a reduction in the dividend payment. Morck and Yeung (2005) and Singhania (2006) argue that an increase in corporate tax rates could lead to the favouring of retained earnings over dividends so as to create long-term capital gains, this being amplified as corporate tax rates increase, especially if dividends are subject to dual taxation. The UK applies a partial imputation tax system to relieve the burden of dual taxation. According to Short et al. (2002), dividends are taxed at both corporate and individual levels taking into account both tax rates. That is, corporate taxes are charged on firm profits and part of this tax is taken into account when calculating shareholders' liability for income tax. Lasfer (1996) proves that, in the UK, the tax burden borne by both the firm and its shareholders under the imputation tax system is negatively associated with the dividend payout, which reflects the tendency of firms to set their dividend policies so as to maximize the after-tax returns to shareholders. Al- Malakawi (2007) reports a decrease in the dividend yield following an increase in the corporate tax rate. On the contrary, Amidu and Abor (2010) and Uwuigbe and Olusegun (2013) report an increase in the dividend payout coupled with a rise in the corporate tax rate. The above results lead to investigation of the following hypothesis:

H10: There is a negative association between the dividend payout ratio and the corporate tax rate.

4.1.11 Firm Size

The relationship between firm size and the dividend policy is based on the notion that large firms tend to be more diversified, less subject to financial distress, and hence can hold lower amounts of cash. This explains the capability of large firms to support high dividend payouts. Another plausible view is given by the transaction cost theory, related to the fact that large-sized firms tend to be more profitable and have easier access to the capital markets. Therefore, they tend to have a higher propensity to make dividend payments since they are more capable of seeking external capital at lower costs than small-sized firms (Al-Najjar and Hussainey, 2009). Following the same vein, firm size is associated with high agency costs: Coupled with the fact that transaction costs associated with the issuance of new equity are lower for large-sized firms, this makes large firms good candidates for making dividend payments (Rozeff, 1982). Empirical evidence supports a direct association between dividend policy and firm size, since large-sized firms pay higher dividends (Bassidiq and Hussainey, 2010). This contributes to the following testable hypothesis:

H11: There is a positive association between the dividend payout ratio and firm size.

4.1.12 Financial Crisis

The impact of the 2008-2009 financial crisis on the financial policies of firms extends beyond the financial sector. Several studies report an adverse effect of the crisis on corporate financial policies, mainly caused by a substantial decline in bank borrowing and associated high costs of external finance (Ivashina and Scharfstein, 2010). The influence of the crisis on corporate dividend policy could have resulted from the following factors: First, the crisis period raised the uncertainty concerning the future supply of credit; this might have led to an increased precautionary demand for cash. Therefore, firms will have tended to reduce their dividend payouts and preserve cash for future investments. Second, the crisis is associated with a large shock to demand and a shift away from consumption towards saving (Mian and Sufi, 2010).

Such a shock is likely to have reduced firm growth opportunities and subsequently the demand for funds. The agency perspective of dividends implies that agency costs of cash retention increase with diminished growth opportunities. Therefore, it is expected that the crisis could be associated with higher payouts. An alternative view holds that, under the crisis, credit was more costly and harder to obtain (Santos, 2011). Consequently, firms are expected to have reacted to the high cost of external financing by reducing dividend payouts and retaining a bigger portion of their operating cash flows for flexibility purposes.

Empirical evidence provided by Smits (2012) shows an insignificant impact of the crisis on dividend payout ratios in the US. This result holds except for large-sized firms with a high percentage of institutional ownership, which witnessed an increase in their payout ratios. This is explained as an attempt by firms to use dividends as a signalling tool to convey information to investors about their financial stability. Floyd et al. (2015) report an increase in aggregate dividends, reaching a peak in 2007, and declining slightly until 2009. Nevertheless, dividend payout ratios for industrial firms increased over the crisis period, caused by a decline in profitability, though dividends per share remained constant. This lends support to the idea of managers' reluctance to reduce dividends, in turn favouring managerial conservatism (Lintner, 1956; Brav et al., 2005). Similarly, Akbar et al. (2013) report a positive yet weakly significant impact of a crisis dummy on the change in dividends for UK private firms. That emphasizes the role of the information content of dividends, particularly during periods of economic distress. On the other hand, Bliss et al. (2015) report a decrease in dividend payouts during the financial crisis caused by an increase in the cost of external financing. Their results show that companies with high leverage, lower cash balances, and more profitable investment opportunities are more likely to have reduced payouts during the crisis as a response to the credit supply shock. Likewise, firms respond to the demand shock that reduces their need for funds by refraining from making dividend decreases, especially true for firms with high reserves of cash and for large-sized firms. The results of the empirical study by Driver et al. (2015) show that highly leveraged UK firms paid lower amounts of dividends during the financial crisis. Therefore, the above evidence leads to the following testable hypotheses:

H13: UK firms decreased their dividend payouts during the financial crisis.

H14: Higher cash flows are positively associated with dividend payouts during the financial crisis.

H15: Firms with high levels of liquidity have higher payout ratios during the financial crisis.

H16: Highly leveraged firms have lower dividend payout ratios during the financial crisis.

H17: Firm size is positively associated with the dividend payout ratio during the financial crisis.

H18: Firms with high institutional ownership have higher dividend payout ratios during the financial crisis.

4.2 Description of Data

The variables employed in this study can be categorized as follows: first, the dependent variable is the dividend payout ratio. Second, Firm risk variables, namely, systematic and unsystematic risks (see **Appendix 4-1** for measurements of risk). Third, basic financial accounting variables are set as time variant across the years of the sample period. Those include: profitability, cash flow, liquidity, leverage, earned capital, firm growth, firm size and corporate tax rate. Finally, ownership variables that consist of the percentage of common stock held by institutional investors and the percentage of common stock held by insiders.

The variables are defined as follows:

1. *Dividend Payout Ratio (DPR)* is a proxy for dividend policy and refers to the ratio of cash dividends to the after-tax earnings of the firm (Farinha, 2003; Lee et al., 2011; Blau and Fuller, 2008).

2. *Systematic Risk (SYS)* is the product of the stock's beta and the standard deviation of the market return.

3. *Unsystematic Risk (UNSYS)* is the standard deviation of the stock return minus the systematic risk of the stock.

4. *Profitability (NOPATTA)* is calculated as the ratio of after-tax earnings before interest and taxes, to total assets.

5. *Cash Flow (FCFTA)* is free cash flow, calculated as operating cash flow less the change in working capital and the change in capital expenditure, divided by total assets. The author also uses *Cash Flow per Share (CFPS)*, in robustness tests, calculated as the annual profit or loss for the period plus depreciation expense, divided by the number of common shares outstanding.

6. *Liquidity (CASHTA)* is measured as the ratio of cash holdings to total assets. *Current Ratio (CR)* is another proxy for liquidity, used in the robustness checks.

7. *Earned Capital* is a proxy for the life cycle, measured as the ratio of net income after tax less total common stock dividends, to total shareholders' equity *(REE)*, or measured as the ratio of net income after tax less total common stock dividends, to total assets*(RETA)*.

8. *Leverage* is measured as the ratio of long term debt to total assets *(LTDTA)*. The author also uses leverage calculated as total debt scaled by total shareholders' equity *(DE)* in robustness tests.

9. *Firm Growth* refers to the annual growth rate of total assets *(g TA)* and is used as a proxy for the life cycle. The author uses the market-to-book ratio *(MB)* as a second *pro*xy for firm growth in robustness tests.

10. *Corporate Taxation (TAX)* is the effective corporate tax rate, calculated by dividing taxes paid, by profit before tax. *Institutional Ownership (ISOWN)* refers to the percentage of common stock held by institutional blockholders (this includes governments, companies, pension funds and investment companies).

11. *Insider Ownership (INSIDE)* is the percentage of common stock held by managers and employees with significant voting power.

12. *Firm Size* is measured using the log of total assets *(log TA)*.

In analysing the interaction effects between determinants of the dividend payout ratio and each of systematic and unsystematic risk, the researcher extends the work of Bhattacharya et al. (2015) and Hutchinson et al. (2015) and develops the following interaction variables:

13. *Systematic Risk * Profitability (SYS*NOPATTA)*
14. *Systematic Risk*Cash Flow (SYS*FCFTA or alternatively SYS*CFPS used in robustness tests)*
15. *Systematic Risk*Liquidity (SYS*CASHTA or alternatively SYS*CR used in robustness tests)*
16. *Systematic Risk*Earned Capital (SYS*REE or alternatively SYS* RETA used in robustness tests)*
17. *Systematic Risk*Leverage (SYS*LTDTA or alternatively SYS*DE used in robustness tests)*
18. *Systematic Risk*Firm Growth (SYS*g TA or alternatively SYS*MB used in robustness tests)*
19. *Systematic Risk *Corporate Taxation (SYS*TAX).*
20. *Systematic Risk *Institutional Ownership (SYS * ISOWN)*
21. *Systematic Risk *Insider Ownership (SYS * INSIDE)*
22. *Systematic Risk * Firm Size (SYS * log TA)*
23. *Unsystematic Risk* Profitability (UNSYS * NOPATTA)*
24. *Unsystematic Risk*Cash Flow (UNSYS * FCFTA or alternatively UNSYS*CFPS used in robustness tests)*
25. *Unsystematic Risk*Leverage (UNSYS*LTDTA or alternatively UNSYS*DE used in robustness tests)*
26. *Unsystematic Risk*Liquidity (UNSYS* CASHTA or alternatively UNSYS*CR used in robustness tests)*

27. *Unsystematic Risk * Firm Growth (UNSYS* g TA or alternatively UNSYS*MB used in robustness tests)*
28. *Unsystematic Risk*Corporate Taxation (UNSYS*TAX)*
29. *Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)*
30. *Unsystematic Risk *Insider Ownership (UNSYS*INSIDE)*
31. *Unsystematic Risk *Firm Size (UNSYS * log TA)*

To analyse the impact of the various determinants of the dividend payout ratio and dividend policies on the cash dividend payout during the financial crisis, the author extends the work of Akbar et al. (2013), Bliss et al. (2015), and Driver et al. (2015) and develops the following interaction variables between a crisis dummy (*Crisis*, is a dummy variable for the years 2008 and 2009) and the abovementioned variables:

32. *Crisis*Systematic Risk (Crisis*SYS)*
33. *Crisis*Unsystematic Risk (Crisis*UNSYS).*
34. *Crisis*Profitability (Crisis*NOPATTA).*
35. *Crisis* Cash Flow (Crisis*FCFTA)*
36. *Crisis*Liquidity (Crisis*CASHTA) [or CR]*
37. *Crisis*Leverage (Crisis*LTDTA) [or DE]*
38. *Crisis*Firm growth (Crisis*g TA) [or MB]*
39. *Crisis* Corporate Taxation (Crisis*TAX)*
40. *Crisis* Institutional Ownership (Crisis*ISOWN)*
41. *Crisis*Insider Ownership (Crisis*INSIDE)*
42. *Crisis*Firm Size (Crisis*log TA)*

In addition, the following *control variables* are used in the analysis:

1. *Time$_t$* (with t=1,....,T)are time dummies that control for the impact of time on the dividend behaviour of all sample firms. This variable is necessary due to the inevitable impact of time on dividend policy (Andres, 2009).

2. *2001* is a dummy variable used to study the burst of the dot-com bubble in 2001.
3. *Crisis* is a dummy variable denoting the 2008-2009 crisis period.

The methodology is designed to explore the determinants of dividend payout ratios in terms of classifying the date set into groups according to firm size, industry, listed versus de-listed and above and below average dividend payout ratio.

The results of the Goldfeld-Quandt test show that there are significant differences between firms with low versus firms with high dividend payout ratios and large versus small size firms. On the contrary, it appears that the crisis and non-crisis periods are not significantly different from each other, as well as listed and de-listed firms. (See **Appendix 4-2** for an explanation of the Goldfeld-Quandt test and test results).

In order to attain the objectives of the study, the researcher develops and examines three models. Model (1) focuses on determinants of the dividend payout ratio and firm risk interaction variables. Model (2) covers determinants of the dividend payout ratio and financial crisis interaction variables. Model (3) covers the impact of causes of de-listing on the payout ratios of de-listed firms.

The full list of variables, together with detailed information on the data items used for variable construction, predicted signs and observed signs from previous empirical studies are presented in Table 4-1.

Table 4-1: Expected Signs of Explanatory Variables

This table provides analytical definitions for all variables used in the analysis. It also provides detailed information on the data items (from Thomson Reuters Datastream) used in the construction of the variables.

Measure	Indicator Factors	Variable	Definition	Data Items Used	Expected Sign [a]	Obs. Sign [b]
Firm Risk	Systematic Risk	SYS	Annual beta multiplied by the standard deviation of the market return	P-FTSE[6]	Negative	Negative
	Unsystematic Risk	UNSYS	The standard deviation of the stock return over a 12-month period, minus systematic risk	P-FTSE	Negative	Negative
Profitability	Profit/Total Assets	NOPATTA	A ratio that measures a company's operating income after tax against its total net assets. The higher the profitability, the more able the company is to have a higher payout ratio.	WC18191 WC01451 WC01401 WC02999	Positive	Positive
Cash Flow	Cash Flow per Share	CFPS	A ratio measured as operating cash flow minus preferred stock dividends divided by the number of common stock shares outstanding	WC05501	Positive	Positive

[6]FTSE is the FTSEAll Share index, obtained from the Yahoo Financial website.

Measure	Indicator Factors	Variable	Definition	Data Items Used	Expected Sign [a]	Obs. Sign [b]
Liquidity	Cash/Total Assets	CASHTA	The ratio of cash holdings to total assets. Firms with high liquidity pay low dividends to maintain their financial flexibility.	WC02003 WC02999	Negative	Mixed
	Current Ratio	CR	The ratio of current assets to current liabilities	WC08106	Negative	Mixed
Life Cycle Theory	Earned Capital/Equity	RE/TA	Retained earnings to total assets. The higher the ratio the more mature the company is and the fewer/smaller the investment opportunities.	WC01706 WC01401 WC05101 NOSH WC02999	Positive	Positive
		REE	The ratio of retained earnings to total equity	WC01706 WC01401 WC05101 NOSH WC03501	Positive	Positive
Life Cycle and Residual Theories	Firm Growth	g TA	Measures annual growth in total assets (TA_t - $TA_{t-1)/}$ $TA_{t-1).}$ The higher is the percentage growth in total assets, the greater are the investment opportunities available to the firm.	WC02999	Negative	Mixed
	Firm Growth	MB	The ratio of the market price per share to the book value per share. The higher is MB, the greater are the future prospects and investment opportunities available to the firm.	MTBV	Negative	Mixed
Financial Leverage	Leverage/Total Assets	LTDTA	A ratio that measures the financial leverage of firms by dividing long-term interest-bearing debt by total assets.	WC03251 WC02999	Positive	Mixed

Measure	Indicator Factors	Variable	Definition	Data Items Used	Expected Sign [a]	Obs. Sign [b]
Agency Theory and Free Cash Flow Hypothesis	Institutional Ownership	ISOWN	Measures the percentage of common stock owned by institutions. The higher the percentage of institutional ownership, the lower will be the need to pay dividends to minimize agency costs.	NOSHCO NOSHGOV NOSHIC NOSHPF	Negative	Mixed
	Insider Ownership	INSIDE	Measures the percentage of common stock owned by managers and employees with significant voting power. The higher the percentage of insiders, the lower will be the need to pay dividends to mitigate agency problems.	NOSHEM	Negative	Negative
	Cash Flow/Total Assets	FCFTA	FCF is the cash flow from operations available after satisfying working capital and capital expenditure requirements. The lower the FCF, the lower will be the funds left at the discretion of the managers and hence the lower the need to pay dividends to minimize agency problems.	WC04860 WC02999	Positive	Positive
Taxation	Corporate Taxation	TAX	The effective tax rate is calculated by dividing taxes, by earnings before tax.	WC01451 WC01401	Negative	Negative

Measure	Indicator Factors	Variable	Definition	Data Items Used	Expected Sign [a]	Obs. Sign [b]
Firm Size-Transaction Cost Theory	Firm Size	log TA	The natural log of total assets. Large-sized firms are hypothesized to have greater problems of information asymmetry and lower transaction costs, making them good candidates for higher dividend payments.	WC02999	Positive	Positive
Crisis	2008-2009 Crisis	Crisis	A dummy variable that takes the value 1 for the years 2008 and 2009 and 0 otherwise.		Negative	Negative

a "Exp Sign" denotes the expected sign, indicating the hypothesized impact of explanatory factors on the dividend payout ratio.

b"Obs Sign" denotes the observed sign in previous empirical studies, indicating the impact of explanatory factors on the dividend payout ratio.

4.3 Data and Sample

4.3.1 Data Sources and Sample Selection Criteria

This study attempts to obtain the strongest possible sample over the longest possible time frame using the largest possible set of companies to achieve the objectives of the research. One of the weaknesses of the majority of the previous research is the focus on studying the dividend policies of listed firms. However, the availability of financial data for companies that are deemed de-listed at the time of the current study allows their inclusion for the purpose of avoiding survivorship bias. In this research, dividend data, data on basic accounting variables, monthly and annual stock prices, and ownership data are gathered from Datastream. The FTSE All Share index values used in the calculation of firm risk are obtained from the Yahoo Financial website.

The researcher started the data collection process by looking up UK non-financial companies over the period of the study (from 1991 to 2014). To avoid sampling bias, the researcher included dividend-paying and non-dividend-paying firms, since paying zero dividends is considered a dividend policy. The following restrictions were applied to the data: First, all firm-years with missing data for dividends, shareholder equity, total assets, number of shares or annual price data were excluded. Second, observations with negative shareholder equity were eliminated. Third, observations outside of three standard deviations from the mean were removed to deal with the issue of outliers. Finally, firms with less than five years of observations were removed to enable the use of GMM estimators that require the use of lagged instruments (Arellano and Bond, 1991). The final sample comprises 1,340 non-financial companies representing 12,296 firm-year observations.

Table 4-2: Number of UK Listed and De-Listed Companies

This table presents the number of UK listed and de-listed firms, classified into financial and non-financial firms, and the numbers in the final sample used in the analysis.

	Listed	**De-listed**
Total number of companies	1,610	7,520
Number of financial companies	350	1,752
Number of non-financial companies	1,260	5,768
Number of companies examined in the study	513	827

Source: *Datastream*

The panel nature of the data requires the use of a panel data methodology. Using panel data involves the pooling of observations in a cross-section of units over several time periods, and provides results that are simply not detectable in pure cross-sections or pure time-series studies.

4.3.2 Sample Description

The firms examined in the current study belong to nine different sectors as per the Industry Classification Benchmark (ICB), a joint system produced by the FTSE Group and Dow Jones Indexes. The researcher grouped the firms into five main sectors, namely, industrial, technology, services, utilities, and other industries

The following table (4-3) displays the number of companies in the examined sample that belong to each of the ICB sectors and the five main sectors used in the analysis.

Table 4-3: UK Non-financial Firms, Classified According to the Industry Classification Benchmark (ICB)

The following table classifies the 1,340 firms in the sample into nine sectors based on the ICB, and into the five main sectors used in the analysis.

ICB Sector	Number of Companies	Main Sector
Basic Materials	116	Other Industries
Consumer Goods	298	Other Industries
Consumer Services	198	Services
Healthcare	63	Services
Industrials	439	Industrial
Oil and Gas	25	Industrial
Technology	153	Technology
Telecommunications	12	Technology
Utilities	36	Utilities
Total	**1340**	

Source: *Datastream*

4.4 Issues with Panel Data Analysis

4.4.1 Panel Data

Panel data analysis is a form of longitudinal data analysis popular among social and behavioural science researchers. Panel data, or longitudinal data, are repeated observations over time for the same set of cross-sectional units (e.g., individuals, firms, portfolios, states, or countries), and have been widely used in economics and finance (Lee, 2006). Panel data analysis relies on repeated observations of sufficient cross-sections. In this respect, panel data analysis enables the researcher to study the dynamics of change with short time series (Yaffee, 2002). The combination of time series with cross-sections enhances both the quantity and quality of the data in ways that would be impossible using only one of these two dimensions (Gujarati, 2003, pp. 638-640).

"Panel data refers to data sets consisting of multiple observations on each sampling unit. This could be generated by pooling time-series observations across a variety of cross-sectional units including countries, states, regions, firms, or randomly sampled individuals or households" (Baltagi, 2002, p.1).

A panel has the following form:

x_{it}, $i=1$ and $N_t=1,\dots,T$, where i is the individual dimension and t is the time dimension.

The panel data used in this research belong to the unbalanced panel category. The number of cross-sections examined is 1,340 firms, while the time-series dimension for the sample under study is unbalanced (some observations are missing, or not all cross-sections are observed in all time periods).

4.4.2 Econometric Models of Panel Data

Most panel data applications are limited to a simple regression with error component disturbances, as follows:

$$Y_{it} = \alpha + \beta_i x' + u_{it} \qquad (4.1)$$

$$u_{it} = \mu_i + \gamma_{it} \qquad (4.2)$$

where *i* denotes the cross-sections, with *i=1,2,...,N*, and *t* denotes the time periods, with *t=1,2,...,T*. Therefore, *i* denotes the cross-section dimension whereas *t* denotes the time-series dimension. α is a scalar, β is a *k* x 1 vector and x'_{it} is a vector of observations of *k* explanatory variables. μ_i is an unobserved individual specific effect. The remainder disturbance γ_{it} varies across individuals and time (Baltagi, 2002, p.11).

The Constant Coefficient Model

The constant coefficient model is one type of panel model. It has constant coefficients referring to both intercepts and slopes. Thus, all of the data can be pooled, and an ordinary least squares (OLS) regression model can be run. Although most of the time, the coefficients of the regression model will not be constant, if none of them are statistically significant, then the OLS can still be used (Yaffee, 2002).

The Fixed Effects Model

The fixed effects model is another type of panel data model, characterized by constant slopes but intercepts that differ according to the cross-sectional group or according to time (Yaffee, 2002). In the fixed effects model, the individual-specific effect is a random variable that is allowed to be correlated with the explanatory variables (Schmidheiny, 2011).

In equations (4.1) and (4.2) above, assume that the μ_i are fixed parameters to be estimated, and the remainder disturbance is stochastic with γ_{it} independently and identically distributed, IID $(0, \sigma_\gamma^2)$. Also, assume that the $\chi_{it}^{'}$ are independent of the γ_{it} for all *i* and *t.* This model would correspond to the fixed effects model (Baltagi, 2002, p. 12).

The Random Effects Model

In the random effects model, the individual-specific effect is a random variable that is uncorrelated with the explanatory variables (Schmidheiny, 2011). The random effects model is a regression with a random constant term (Greene, 2000, p.183). In equations (4.1) and (4.2), assume μ_i ~IID$(0, \sigma_\mu^2)$, γ_{it} ~IID$(0, \sigma_\gamma^2)$, μ_i independent of γ_{it}, and $\chi_{it}^{'}$ independent of μ_i and γ_{it} for all *i* and *t*. This model would correspond to the random effects model (Baltagi, 2002, p. 15).

Hausman Specification Test

It is a common practice in economic research to choose between fixed or random effects using the Hausman (1978) specification test. This test facilitates the choice by testing for correlation between the explanatory variables and the individual random effects. The Hausman test checks for strict exogeneity. If no correlation is found, random effects should be employed but if correlation does exist, fixed effects should be employed. Therefore, the test is run under the following hypotheses:

$$\begin{array}{l} \mathrm{H}_0 : \mathrm{cov}(x_{it}, \lambda_\mathrm{k}) = 0 \\ \mathrm{H}_1 : \mathrm{cov}(x_{it}, \lambda_\mathrm{k}) \neq 0 \end{array} \text{ where } x_{it} = \text{regressors, and } \lambda_\mathrm{k} = \text{error term} \qquad (4.3)$$

4.5 Panel Data Model Estimation

The dynamic nature of the panel data used in this research makes endogeneity a potential problem that should be tackled through the use of an instrumental variable estimation method such as the GMM. The Hausman test for endogeneity is carried out, and the results prove that the majority of the variables suffer from endogeneity, which makes the GMM an efficient estimation method. The GMM is explained in detail in Section 4.5.1 below.

4.5.1 Generalized Method of Moments (GMM)

The researcher uses dynamic panel data pertaining to UK firms for the years 1991 to 2014. In panel data analysis it is somewhat difficult to establish exogeneity between the regressors and error term, especially with firms' financial data. This causes the direction of causality between the variables to be ambiguous due to potential endogeneity.

The GMM is an instrumental variable estimation method, widely used for models with random regressors. It has the advantage of solving the problem of the simultaneity bias between the dividend measure and the explanatory variables, and the measurement error issue. It also allows for controlling unobserved individual effects present in the static model. The main advantage of GMM, however, is that the model does not need to be homoscedastic and serially independent (Hansen, 1982; Arellanno and Bond, 1991; Arellanno and Bover, 1995).

Firm and individual effects are primarily treated by first-differencing the variables, while the use of dummies for each year takes care of the time effects (Hansen, 1982).

Consider the following model:

$$y_{it=}\alpha y_{it-1} + \beta \grave{X}_{\iota t} + \gamma f_i + u_{i\grave{t}} \qquad (4.4)$$

where

$$u_{it=} \eta_{it} + v_{it} \quad and \; E(v_{it}/x_{i0} \;, \ldots\ldots\ldots x_{iT,}\eta_{i}) = 0 \qquad (4.5)$$

η_{it} is an observed individual effect and v_{it} is a disturbance term. In this model, unrestricted serial correlation in v_{it} implies that y_{it-1} is an endogenous variable.

In estimating the dividend model, the GMM is used since it allows the possibility of simultaneous determination and reverse causality of the dividend payout ratio with other explanatory variables. Thus, the assumption that all explanatory variables are strictly exogenous is relaxed. Under the GMM, instrumental variables that are uncorrelated with the unobservable effects, such that these effects are not included in the error term are used. The researcher uses Arellano and Bover's (1995) system estimator, *GMM in system*, to overcome the shortcomings of *GMM in difference* suggested by Arellano and Bond (1991). Although GMM in difference solves the potential problem of unobserved individual effects, Blundell and Bond (1998) show that, when the dependent and explanatory variables are persistent overtime, lagged levels of these variables are weak instruments for the regression equation in differences. The GMM-in-system estimator for dynamic panel data models combines moment conditions for the model in first differences, with moment conditions for the model in levels. Arellano and Bover (1995) show that, when there are instruments available that are uncorrelated with the individual effects η_i, these variables can be used as instruments for the equations in levels. This requires the use of lagged differences in endogenous variables as instruments. The GMM-in-system estimator makes an additional assumption that differences in the right-hand-side variables are not correlated with the unobserved individual effects or the precision of the coefficient estimates.

The GMM-in-system estimator is used to control for unobserved firm-specific effects that might be correlated with other explanatory variables, causing OLS estimators to be biased and inconsistent.

The basic testable model in this study is based on equation (4.6):

$$y_{it} = \alpha_i + ß_1 x_{1it} + \ldots\ldots + ß_k x_{kit} + \text{Time}_t + \eta_{it} + \nu_{it} \quad (4.6)$$

y_{it}=is the dependent variable, the dividend payout ratio at time t.

x_{kit}= the explanatory variables at time t.

$Time_t$ (with t=1,…..,T)are time dummies that control for the impact of time on the dividend payout ratios of all sample firms.

η_{it} =is a firm-specific effect that allows for the unobserved influences on the dividend behaviour of each firm, and is assumed to remain constant over time.

υ_{it} = is the disturbance term.

In dynamic panel models such as that shown in equation (4.5), it is likely that the explanatory variables will be correlated across firms, with firm-specific effects (η_{it}). Thus, if the equation is estimated using OLS, the estimators are likely to be inconsistent and biased, because cov(x_{it}, η_{it})≠0,where x_{it} are the explanatory variables at time *t*(Hsiao, 1986).

To obtain consistent estimators, the model in equation (4.6) is first-differenced to eliminate the fixed effects (η_{it}) (Arellano and Bond, 1991):

$$y_{it} - y_{it\text{-}1} = \alpha_i + ß_1 (x_{1it} - x_{1it\text{-}1}) + ... + ß_k (x_{kit} - x_{kit\text{-}1}) + Time_t - Time_{t\text{-}1} + v_{it} - v_{it\text{-}1} \quad (4.7)$$

Following Arellano and Bover (1995) and Blundell and Bond (1998), the author proposes a linear GMM estimator in a system of first-differenced and level equations. This linear estimator uses lagged differences in the series as instruments for the equations in first differences. Specifically, it uses ($x_{\text{it-1}}$ -$x_{\text{ it-2}}$) and ($x_{\text{kt-1}}$ - $x_{\text{ kt-2}}$) in addition to lagged levels of the series dated (t-2), (t-3) and (t-4), under the assumption that these differences are uncorrelated with the firm-specific effects (η_{it}), even though the levels of the series are correlated with η_{it}.

4.6 Panel Data Tests

4.6.1 Linearity Test

The first step is to test for linearity using the Regression Equation Specification Error Test, RESET (Ramsey, 1969; Thursby and Schmidt, 1977; Sapra, 2005), to test the following two hypotheses:

$$\begin{aligned} &H_0 : \hat{\gamma}^2, \hat{\gamma}^3 = 0 \\ &H_1 : \hat{\gamma}^2, \hat{\gamma}^3 \neq 0 \end{aligned} \quad (4.8)$$

The null hypothesis refers to linearity and the alternative to nonlinearity. If the results of the F test $(\alpha = 5\%)$ show that the F statistic is greater than the critical value, this leads to the rejection of the null hypothesis, implying that a nonlinear model is appropriate.

4.6.2 Normality Test

Normality is another important assumption of regression models. Normality means that the variables should follow a normal distribution. In this respect, the more the data follow a normal distribution, the more accurate will be the results (Berenson et al., 2009, p. 326).

The Anderson-Darling test (Anderson and Darling, 1952, 1954) is used to test whether the data follow a normal distribution. It measures the closeness of the variable distribution to the assumptions of a normal distribution. It is an alternative to the chi-square and Kolmogorov-Smirnov (K-S) goodness-of-fit tests and is used to test whether a sample of data came from a population with a specific distribution. Anderson-Darling is a modification of the K-S test that gives more weight to the tails. The K-S test is distribution-free in the sense that the critical values do not depend on the specific distribution being tested. The Anderson-Darling test makes use of the specific distribution in calculating the critical values. This has the advantage of allowing a more sensitive test but the disadvantage that the critical values are dependent on the specific distribution being tested. Tabulated values and formulas have been published (Stephens, 1974, 1979,1986) for a few specific distributions (normal, lognormal, exponential, Weibull, logistic, extreme-value type 1).

The Anderson-Darling test is run under the following hypotheses:

H0: The data are drawn from a normal distribution.

H1: The data are drawn from a non-normal distribution.

4.6.3 Panel Unit Root Test

The difference between stationary and non-stationary time series is that, in the former, shocks are temporary, and over time their effect will be eliminated as the series return to their long-run mean values. On the other hand, in non-stationary (unit root) time series, the mean and variance depend on time, and the series contain permanent components: In some cases, there is no long-run mean to which the series can revert. The variance will depend on time and tends to approach infinity as time goes to infinity (Asteriou and Hall, 2011, p. 335).

In this study, the Levin and Lin (LL) test (Levin et al., 2002) is used to test for a panel unit root and is based on the following equation:

$$\Delta y_{i,t} = a_i + p\,\Delta y_{i,t-1} + \sum_{k=1}^{n} \emptyset\, k\ \Delta y_{i,t-1} + \delta_i\ t + \theta_i + u_{it} \qquad (4.9)$$

This model allows for two-way fixed effects, unit-specific fixed effects and unit-specific time effects which allow for heterogeneity.

The null and alternative hypotheses of the test are as follows:

$$H_0 = p = 0$$
$$H_1 = p < 0$$

(4.10)

The LL test is viewed as a pooled Dickey-Fuller (DF) or Augmented Dickey-Fuller (ADF) test with different lag lengths across different sections of the panel (Asteriou and Hall, 2011, p. 443).

4.6.4 Collinearity Test

Multi-collinearity refers to a situation in which two or more variables are very closely linearly related, which makes coming up with reliable estimates of their individual regression coefficients difficult (Field, 2009, p. 790). In other words, the two variables are essentially conveying the same information. In addition, this relationship tends to distort model results due to the difficulty of isolating the impact of the relationship between the supposedly independent variables. The variance inflation factor (VIF) model is used to test the collinearity between the independent variables of the model. The VIF can be calculated using the following equation:

$$VIF = 1/R^2 \qquad (4.11)$$

The decision rule is that, if the VIF coefficient for any independent variable is equal to one, that variable is independent of the other variables; i.e., collinearity has no significant effect on the relationship between that independent variable and the dependent variable. The independent variable is considered to be independent and in collinearity with other independent variables if the VIF coefficient of the variable is greater than five (Berenson et al., 2009, p. 492).

4.6.5 Autocorrelation Test

The independence-of-errors assumption requires the errors of the regression equation to be independent of one another; otherwise, autocorrelation exists. This requires that, for any two observations in the regression, the residuals should be uncorrelated or independent.

The Durbin-Watson statistic test is used to test for the independence of errors. It tests for serial correlation of errors in regression models and whether adjacent residuals are correlated. The test statistic can vary between 0 and 4, with a value of 2 meaning that the residuals are uncorrelated. A value greater than 2 indicates that the residuals are negatively correlated, whereas a value below 2 indicates non-correlation between the residuals. As a very conservative rule of thumb, values less than 1 or greater than 3 are definitely causes for concern (Field, 2009, p. 785).

4.6.6 Homoscedasticity Test

Homoscedasticity means that the variance of errors is the same across all levels of the independent variables. When the variance of errors differs at different values of the independent variables, heteroscedasticity is indicated. According to Berry and Feldman (1985), slight heteroscedasticity has little effect on significance tests; however, when heteroscedasticity is obvious, it can lead to serious distortion of the findings, can seriously weaken the analysis, and might lead to standard errors.

White's test (1980) is used in this study to test for heteroscedasticity. It is a general Lagrange- Multiplier (LM) test that does not assume prior determination of heteroscedasticity and is not based on the normality assumption. The test involves running a model based on the following equation:

$$y_i = \beta_1 + \beta_2 x_{2i} + \beta_3 x_{3i} + u_i \quad (4.12)$$

The residuals from the above regression are obtained and the following auxiliary regression is run:

$$\hat{u}_i^2 = a_1 + a_2 x_{2i} + a_3 x_{3i} + a_4 x_{2i}^2 + a_5 x_{3i} + a_6 x_{2i} x_{3i} + \gamma_i \quad (4.13)$$

That is, all squared residuals, all explanatory variables, the explanatory variables squared, and their cross-products are regressed on a constant.

The null hypothesis for the test is as follows:

$$H_0 = a_1 = a_2 = \ldots\ldots = a_p = 0 \qquad (4.14)$$

while the alternative is that at least one of the as is different from zero. LM=nR^2 is calculated, where n is the number of observations used to estimate the auxiliary regression in equation (4.13), and R^2 is the coefficient of determination for the regression. The LM test follows the x^2distribution with 6-1 degrees of freedom. If the LM statistic is greater than the critical value, the null is rejected, and there is significant evidence of heteroscedasticity (Asteriou and Hall, 2011, pp.127-128).

4.7 Multiple Regression Analysis

Multiple regression analysis is used as a means of conducting multivariate analysis by simultaneously analysing three or more independent variables. This analysis is aimed at assessing the strength of the relationship between the dependent variable and one or more explanatory variables. It can also be used as a means of predicting the value of a dependent variable from one or more independent variables. Multiple regression analysis is used to study the effect of the various dividend determinants, and systematic and unsystematic risk, on the dividend policy. This is estimated by means of the following least squares dummy variable (LSDV) model:

$$\mathbf{y}_{\mathrm{tk}}^{3} = \alpha_{\mathrm{k}} + \sum_{\mathrm{i}=1}^{\mathrm{k}} \beta_{\mathrm{ik}} \mathbf{X}_{\mathrm{itk}}^{3} + \lambda_{\mathrm{k}} + \upsilon_{\mathrm{tk}} \qquad (4.15)$$

where $t = 1, \ldots, n$

k = the number of firms in each group

$\mathbf{y}_{tk}$ = the Dividend Payout Ratio (DPR)

$\mathbf{X}_{itk}$ = the determinants of the dividend policy

λ_k = random error term due to individual effects

υ_{tk} = random error

e-views© is used for the estimation procedure.

4.8 Chapter Summary

This study employs a panel data methodology to investigate the dividend policy of UK non-financial companies. The major determinants of the dividend payout ratio, including systematic and unsystematic risk, profitability, cash flow, liquidity, leverage, and corporate taxation, are examined. In addition, the applicability of the life cycle, agency, transaction cost and residual theories of dividends is tested. Investigating the impact of the financial crisis on the dividend policy necessitates the use of a crisis dummy and crisis interaction variables to assess the major determinants of dividend payouts during the financial crisis of 2008-2009.

The research is conducted on 1,340 UK non-financial companies in the period from 1991 to 2014. Examining panel data necessitates the use of a panel data methodology in which observations are pooled on a cross-sectional and time-series basis to capture the effects not easily detectable in pure time-series or cross-sectional data. Goodness-of-fit tests are carried out to ensure the assumptions of panel data analysis are not violated. Those tests include tests of fixed and random effects, and tests of linearity, normality, unit roots and multicollinearity. The researcher selected the GMM as the estimation method due to the endogenous nature of panel data. This method has the advantage of solving the problem of simultaneity bias between the dividend measure and the explanatory variables, and also deals with the measurement error issue. To avoid the problem of the dependent and explanatory variables being persistent over time, the researcher uses GMM-in-system. This estimator is used to control for unobserved firm-specific effects that might be correlated with other explanatory variables, causing OLS estimators to be biased and inconsistent.

Appendix (4-1): Measurements of Systematic and Unsystematic Risk

The standard approach extensively used in literature to measure systematic and unsystematic risk is based on using the CAPM as a single factor model as follows:

$$R_{it} - r_{ft} = \beta(R_{mt} - r_{ft}) + \varepsilon_{it} \qquad (1)$$

R_{it} is the return on stock i, R_{mt} is the market return, r_{ft} is the risk-free rate ,$ß$is systematic risk, and ε_{it} is the unsystematic risk. However, this measure of systematic and systematic risk can only be applied to time series data.

Bali et al. (2003) use the standard market model to calculate the stock variance and constructed the firm-level volatility measure of Campbell et al. (2001) to determine its own contribution to the prediction of excess market return. The standard market model calculates the stock variance using the following formula:

$$R_{it} = \alpha + \beta R_{mt} + \varepsilon_{it} \qquad (2)$$

R_{it} is the return on company i at time t, ß is stock i's measure of systematic risk, R_{mt} is the return on market at time t while ε_{it} is the unsystematic risk measure.

Statistically, systematic and unsystematic components of stock returns in the market model can be computed as follows.

$$\beta = \frac{COV(R_j, R_M)}{\sigma_M^2} \qquad (3)$$ [7]

Where $COV(R_j, R_M)$ is the covariance between stock return and the market index return. The σ_M^2 is the variance of the market index.

---

[7]The stock return is measured as $R_t = \ln \frac{P_t}{P_{t-1}}$ where P_t = the closing price at the end of a quarter and P_{t-1} = the closing price in the previous quarter

The systematic and unsystematic risks are estimated as follows (Bohren, 1997; Horim and Levy, 1980).[8]

$$Systematic Risk = \beta \times \sigma_M \quad (4)$$

$$Unsystematic Risk = \sigma_j - Systematic Risk \quad (5)$$

[8] Bohren, O. 1997. Risk Components and the Market Model: a Pedagogical Note. *Applied Financial Economics*, 7, 307-310

Horim, B. M. and Levy, H. 1980. Total risk, diversifiable risk and non-diversifiable risk: a pedagogical note. *Journal of Financialand Quantitative Analysis*, 15, 289-297.

Appendix (4-2): Goldfeld-Quandt Test

The Goldfeld-Quandt (1965) test is a formal statistical test for heteroscedasticity. The test is based on splitting the total sample of length T into two sub-samples of length T_1 and T_2. The OLS regression model is estimated for each sub-sample and the mean residual (RSS) for each equation is obtained. The F-statistic is calculated as follows:

$$F = \frac{RSS_1}{RSS_2}$$

where the RSS within the largest value is the numerator. The F-statistic is distributed with $F_{(1/2(n-c)-k,1/2(n-c)-k)}$ degrees of freedom. If F-statistic>F-critical the null hypothesis of homoskedasticity is rejected.

The following Tables (1) to (4) present the results of the Goldfeld-Quandt test for firms classified according to dividend payout ratio, firm size, crisis versus non-crisis and listed versus de-listed.

Table (1): Goldfeld-Quandt Test for UK firms grouped by dividend payout ratio

Data Input	N1=	3337
	K1=	42
	MS Residual 1	0.375
	N2=	6653
	K2=	45
	MS Residual 2	0.355
	α=	5%
Computed Values	M1=	3295
	M2=	6608
	F statistic=	1.056
Goldfeld-Quandt Test		
Right tail	F_c=	1.0506
	Conclusion=	**Reject H0**
Two-Tail	F_{Lc}=	0.9423
	F_{Uc}=	1.0606
	Conclusion=	**Do Not Reject H0**

Table (2): Goldfeld-Quandt Test for UK firms grouped by Firm Size

Data Input	N1=	5814
	K1=	41
	MS Residual 1	0.467
	N2=	6182
	K2=	41
	MS Residual 2	0.397
	α=	5%
Computed Values	M1=	5773
	M2=	6141
	F statistic=	1.1763
Goldfeld-Quandt Test		
Right tail	F_c=	1.0436
	Conclusion=	**Reject H0**
Two-Tail	F_{Lc}=	0.9504
	F_{Uc}=	1.0521
	Conclusion=	**Reject H0**

Table (3): Goldfeld-Quandt Test for UK firms grouped by Crisis versus Non-Crisis Period

Data Input	N1=	669
	K1=	45
	MS Residual 1	0.49
	N2=	11627
	K2=	45
	MS Residual 2	0.498
	α=	5%
Computed Values	M1=	624
	M2=	11582
	F statistic=	0.9839
Goldfeld-Quandt Test		
Right tail	F_c=	1.0978
	Conclusion=	**Do Not Reject H0**
Two-Tail	F_{Lc}=	0.890
	F_{Uc}=	1.117
	Conclusion=	**Do Not Reject H0**

Table (4): Goldfeld-Quandt Test for UK firms grouped as Listed and De-listed firms

Data Input	N1=	5400
	K1=	45
	MS Residual 1	0.67
	N2=	8702
	K2=	45
	MS Residual 2	0.809
	α=	5%
Computed Values	M1=	5355
	M2=	8657
	F statistic=	0.8319
Goldfeld-Quandt Test		
Right tail	F_c=	1.0412
	Conclusion=	**Do Not Reject H0**
Two-Tail	F_{Lc}=	0.9528
	F_{Uc}=	1.0492
	Conclusion=	**Reject H0**

CHAPTER 5

EMPIRICAL RESULTS

INTRODUCTION

This chapter starts with a presentation of the various panel data test results conducted for the sample used. The tests presented in Section 5.2 are as follows: The Hausman specification test for fixed and random effects, the RESET linearity test, the Anderson-Darling normality test, the panel unit root test and the variance inflation factor (VIF) test for multicollinearity, the White test for heteroscedasticity and the Durbin-Watson test for autocorrelation.

The following section (5.3) presents the descriptive statistics for the entire sample of UK non-financial companies and for firms grouped according to the level of dividend payout ratio, firm size and industry. In the subsequent section (5.4), the empirical results based on the GMM are discussed and compared, starting with the entire sample's results, followed by the group results. The results are presented for three models. Model (1) examines determinants of the dividend payout ratio and the interaction effects between those determinants and each of systematic and unsystematic risks. Model (2) examines determinants of the dividend payout ratio and the impact of the global financial crisis on the dividend payout ratio. Model (3) investigates the impact of causes of de-listing on the dividend payout ratio.

5.1 Specification Test Results

5.1.1 Hausman Specification Test Results

The Hausman specification test is used in this study to distinguish between fixed and random effects. **Table 5-1** below depicts the results of the Hausman specification test for UK non-financial companies.

Table 5-1: Hausman Specification Test – Correlated Random Effects

This table presents the Hausman test results for the sample of 1340 UK companies over the period of 1991-2014.

Test for Cross-Section Random Effects	Chi-Sq. Statistic	Chi-Sq. d.f	p-value
Cross-section random	284.388	15	0.000

The p-value for the test is less than 1%, indicating that the random effects estimation is violated and the fixed effects are the only consistent estimator (Brooks, 2009, p. 509).

5.1.2 Linearity Test Results

The researcher conducted a RESET test to assess whether the relationships between the dependent and independent variables are linear or not. The results of the F-test for α=5% show that the F-statistic (118.997) is greater than the critical value (2.997). This leads to rejection of the null hypothesis, and the researcher therefore raised the data to the power of three to linearize the variables.

5.1.3 Normality Test Results

The results of the Anderson-Darling test for the dependent and explanatory variables, pre-normalization, are presented in **Table 5-2**.

Table 5-2: Anderson-Darling Test Results

This table presents the results of the Anderson-Darling normality test for 1340 UK companies in the period 1991-2014.

Measure	Variable	A-Squared	p-value
Dividend Payout Ratio	DPR	985.75	0.000
Systematic Risk	SYS	68.786	0.000
Unsystematic Risk	UNSYS	404.942	0.000
Profitability	NOPATTA	545.304	0.000
Cash Flow (Free Cash Flow-to-total assets)	FCFTA	2.2E+03	0.000
Cash Flow (Cash Flow per Share)	CFPS	3.0+E03	0.000
Liquidity (Cash-to-total assets)	CASHTA	1.4E+03	0.000
Liquidity (Current ratio)	CR	458.825	0.000
Earned Capital (Retained earnings-to-equity)	REE	630.919	0.000
Earned Capital (Retained earnings-to-total assets)	RETA	408.362	0.000
Firm Growth (Market-to-book)	MB	2.1E+03	0.000
Firm Growth (Growth of total assets)	gTA	719.811	0.000
Leverage (Long term debt-to-total assets)	LTDTA	1.8E+03	0.000
Leverage (Long term debt-to-equity)	LTDE	1.9E+03	0.000
Leverage (Debt-to-equity)	DE	815.695	0.000
Leverage (Debt-to-total assets)	DTA	174.421	0.000
Corporate Taxation	TAX	369.001	0.000
Institutional Ownership	ISOWN	2.1E+03	0.000
Insider Ownership	INSIDE	3.2E+03	0.000
Firm Size (Log Total Assets)	log TA	121.630	0.000
Firm Size (log Market Capitalization)	LOGMC	74.783	0.000
Time	Time	310.143	0.000
Systematic risk*Profitability	SYS*PROF	611.333	0.000
Systematic risk*Free cash flow/total assets	SYS*FCF	2.2E+03	0.000
Systematic risk*Cash flow per Share	SYS*CFPS	3.1E+03	0.000
Systematic risk*Cash/total assets	SYS*CASH	1.5E+03	0.000
Systematic risk*Current ratio	SYS*CR	540.132	0.000
Systematic risk*Market-to-book	SYS*MB	2.3E+03	0.000
Systematic risk*Growth of total assets	SYS*GTA	1.4E+03	0.000
Systematic risk*Retained earnings/equity	SYS*RE	4.0E+03	0.000
Systematic risk*Long term debt/total assets	SYS*LTDTA	4.5E+03	0.000
Systematic risk*Debt/equity	SYS*DE	4.3E+03	0.000
Systematic risk*Institutional ownership	SYS*ISOWN	2.3E+03	0.000

Measure	Variable	A-Squared	p-value
Systematic risk*Insider ownership	SYS*INSIDE	4.5E+03	0.000
Systematic risk*Log of total assets	SYS*LOGTA	95.946	0.000
Systematic risk*Corporate taxation	SYS*TAX	310.809	0.000
Unsystematic risk*Profitability	UNSYS*PROF	1.2E+03	0.000
Unsystematic risk*Free cash flow/total assets	UNSYS*FCF	2.3E+03	0.000
Unsystematic risk*Cash flow per share	UNSYS*CFPS	3.1E+03	0.000
Unsystematic risk*Cash/total assets	UNSYS*CASH	1.9E+03	0.000
Unsystematic risk*Current ratio	UNSYS*CR	930.935	0.000
Unsystematic risk*Market-to-book	UNSYS*MB	2.8E+03	0.000
Unsystematic risk*Growth of total assets	UNSYS*GTA	1.2E+03	0.000
Unsystematic risk*Retained earnings-to-equity	UNSYS*RE	1.5E+03	0.000
Unsystematic risk*Long term debt-to-total assets	UNSYS*LTDTA	2.0E+03	0.000
Unsystematic risk*Total debt-to-equity	UNSYS*DE	1.7E+03	0.000
Unsystematic risk*Institutional ownership	UNSYS*ISOWN	2.3E+03	0.000
Unsystematic risk*Insider ownership	UNSYS*INSIDE	3.2E+03	0.000
Unsystematic risk*Log of total assets	UNSYS*LOGTA	381.530	0.000
Unsystematic risk*Corporate taxation	UNSYS*TAX	426.835	0.000
2001	2001	4.5E+03	0.000
Crisis	Crisis	4.4E+03	0.000
Crisis*Systematic risk	Crisis*SYS	3.0E+03	0.000
Crisis*Unsystematic risk	Crisis*UNSYS	2.8E+03	0.000
Crisis*Profit	Crisis*NOPATTA	4.0E+03	0.000
Crisis*Free Cash Flow-to-total assets	Crisis*FCF	4.0E+03	0.000
Crisis*Cash flow per Share	Crisis*CFPS	4.3E+03	0.000
Crisis*Cash-to-total assets	Crisis*CASHTA	4.2E+03	0.000
Crisis*Current ratio	Crisis*CR	4.1E+03	0.000
Crisis*Retained earnings-to-equity	Crisis*REE	4.0E+03	0.000
Crisis*Retained earnings-to-total assets	Crisis*RETA	4.2E+03	0.000
Crisis*Growth of total assets	Crisis*GTA	4.1E+03	0.000
Crisis*Market-to-book	Crisis*MB	4.2E+03	0.000
Crisis*Long term debt-to-total assets	Crisis*LTDTA	4.5E+03	0.000
Crisis*Total debt-to-equity	Crisis*DE	4.3E+03	0.000
Crisis*Log of total assets	Crisis*Log TA	4.3E+03	0.000
Crisis*Corporate taxation	Crisis*TAX	4.2E+03	0.000
Crisis*Institutional ownership	Crisis*ISOWN	4.3E+03	0.000
Crisis*Insider ownership	Crisis*INSIDE	4.5E+03	0.000

Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity .Earned Capital/Total Assets (RETA) is the ratio of retained earnings to total assets. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CFPS, CASHTA, CR, gTA, MB, REE, RETA LTDTA, DE, logTA, TAX, ISOWN and INSIDE).2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, NOPATTA, FCFTA, CFPS, CASHTA, CR, REE, RETA, gTA, MB, LTDTA, DE, TAX, log TA, ISOWN, INSIDE).

It is evident that the pre-normalization p-value for all variables is significant at the 99% confidence level. This leads to the rejection of the null hypothesis, indicating that the variables do not come from a normal distribution. Therefore, an approximation to normality is necessary to satisfy the multivariate analysis's main assumptions. The Van der Waerden method is carried out to approximate the data to a normal distribution (Conover, 1999, p. 396; Wright, 2000), based on smoothed ranks. The signed ranks are smoothed by converting them to quantiles of a normal distribution (normal scores) using the equation that follows:

$$r_{2t} = \Phi^{-1}\left(r \frac{\Delta Y_t}{T+1} \right) \qquad (5.1)$$

5.1.4 Collinearity Test

The researcher used the Pearson correlation matrix and then the VIF test to ensure that the model was free from multicollinearity.

Variance Inflation Factor (VIF)

The researcher calculated the VIFs to diagnose collinearity. Variables with a VIF greater than 5 were eliminated from the regression in descending order (variables with the highest VIF values were eliminated first). Only variables with a VIF below 5 were retained, ensuring that none of the independent variables exhibits collinearity with any of the other explanatory variables (Berenson et al., 2009, p.492). Thus, multicollinearity is not a problem in the model.

Tables 5-3 and **5-4** below present the VIF test results for Models (1) and (2). Model (1) focuses on determinants of the dividend payout ratio and firm risk interaction variables, whereas Model (2) covers determinants of the dividend payout ratio and financial crisis interaction variables.

Table 5-3: Model (1) Variance Inflation Factor (VIF) Test Results –Determinants of Dividend Payout Ratio and Firm Risk Interaction Variables

This table presents the results of the VIF test for 1340UK companies in the period 1991-2014, including the interaction variables for systematic and unsystematic risks.

Coefficient							
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
	B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
(Constant)	.106	.007		14.411	.000		
Systematic Risk (SYS)	-.040	.007	-.042	-5.340	.000	.739	1.354
Unsystematic Risk (UNSYS)	-.111	.008	-.118	-13.798	.000	.628	1.592
Profitability (NOPATTA)	.546	.013	.577	41.786	.000	.239	4.176
Free Cash Flow-to-Total Assets (FCFTA)	.057	.007	.060	8.052	.000	.811	1.234
Cash Flow per Share (CFPS)	.086	.011	.091	8.009	.000	.353	2.833
Cash –to- Total Assets (CASHTA)	-.017	.007	-.018	-2.277	.023	.737	1.357
Current Ratio (CR)	-.045	.008	-.047	-5.909	.000	.718	1.393
Growth of Total Assets (gTA)	-.049	.007	-.052	-7.183	.000	.865	1.156
Market-to-book ratio (MB)	.177	.008	.187	23.080	.000	.692	1.446
Retained Earnings to Equity (REE)	-.802	.013	-.848	-63.851	.000	.259	3.867
Long Term Debt to total assets (LTDTA)	.002	.009	.002	.241	.810	.835	1.197
Total Debt to Equity (DE)	.087	.008	.090	10.353	.000	.601	1.663
Corporate Taxation (TAX)	.295	.007	.312	40.014	.000	.752	1.329
Institutional Ownership (ISOWN)	-.051	.010	-.041	-5.001	.000	.670	1.492
Insider Ownership (INSIDE)	-.061	.012	-.042	-5.247	.000	.708	1.413
Log of Total Assets (log TA)	.097	.010	.102	9.876	.000	.426	2.345
Systematic Risk*NOPATTA	-.071	.013	-.082	-5.600	.000	.212	4.712

Coefficient							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Systematic Risk*FCFTA	.010	.008	.011	1.302	.193	.685	1.459
Systematic Risk * CFPS	.073	.011	.082	6.888	.000	.319	3.131
Systematic Risk * CASHTA	-.012	.008	-.013	-1.551	.121	.641	1.561
Systematic Risk * CR	-.005	.008	-.006	-.684	.494	.623	1.605
Systematic Risk * gTA	-.005	.007	-.006	-.735	.462	.739	1.352
Systematic Risk *MB	-.029	.007	-.032	-4.066	.000	.716	1.396
Systematic Risk * REE	.090	.013	.102	7.007	.000	.214	4.666
Systematic Risk * LTDTA	.027	.009	.023	2.906	.004	.752	1.330
Systematic Risk * DE	-.003	.008	-.003	-.320	.749	.598	1.672
Systematic Risk * log TA	-.043	.010	-.045	-4.430	.000	.447	2.237
Systematic Risk * TAX	-.008	.007	-.009	-1.083	.279	.690	1.450
Systematic Risk * ISOWN	-.012	.011	-.010	-1.134	.257	.632	1.583
Systematic Risk * INSIDE	-.023	.012	-.017	-2.032	.042	.633	1.579
Unsystematic Risk*NOPATTA	-.071	.013	-.079	-5.360	.000	.212	4.726
Unsystematic Risk*FCFTA	.019	.008	.021	2.531	.011	.691	1.447
Unsystematic Risk * CFPS	.130	.011	.144	12.250	.000	.332	3.012
Unsystematic Risk * CASHTA	-.025	.008	-.026	-3.123	.002	.654	1.530
Unsystematic Risk * CR	.010	.008	.011	1.214	.225	.609	1.642
Unsystematic Risk * gTA	.008	.007	.009	1.161	.246	.731	1.367
Unsystematic Risk *MB	-.053	.007	-.058	-7.162	.000	.696	1.436
Unsystematic Risk * REE	.173	.013	.191	13.241	.000	.219	4.570
Unsystematic Risk * LTDTA	.025	.009	.022	2.791	.005	.706	1.417
Unsystematic Risk * DE	-.078	.008	-.083	-9.194	.000	.554	1.803
Unsystematic Risk * log TA	-.020	.009	-.022	-2.092	.036	.400	2.499
Unsystematic Risk * TAX	.013	.008	.014	1.709	.088	.659	1.518

Coefficient							
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
	B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
Unsystematic Risk * ISOWN	-.024	.010	-.019	-2.324	.020	.664	1.506
Unsystematic Risk * INSIDE	-.004	.012	-.003	-.322	.748	.637	1.569
Dependent Variable: Dividend payout ratio							

Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Earned Capital/Total Assets (RETA) is the ratio of retained earnings to total assets. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic risk*X and Unsystematic risk*X are interaction variables between Systematic or Unsystematic risks and each variable X respectively (where X is NOPATTA, FCFTA, CFPS, CASHTA, CR, gTA, MB, REE, LTDTA, DE, log TA, TAX, ISOWN and INSIDE).A dummy variable for time is used in the regression.

Table 5-4: (Model 2) Variance Inflation Factor (VIF) Test Results – Determinants of Dividend Payout Ratio and Crisis Interaction Variables

This table presents the results of the VIF test for 1340UK companies in the period 1991-2014, including the interaction variables for the crisis period.

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	.028	.007		3.958	.000		
Systematic Risk (SYS)	-.044	.008	-.047	-5.728	.000	.742	1.347
Unsystematic Risk (UNSYS)	-.114	.008	-.121	-13.588	.000	.628	1.591
Profitability(NOPATTA)	.584	.013	.618	45.433	0.000	.270	3.707
Free Cash Flow-Total Assets (FCFTA)	.067	.007	.071	9.075	.000	.810	1.234
Cash Flow per Share (CFPS)	.075	.011	.079	6.798	.000	.370	2.704
Cash-to-Total Assets (CASHTA)	-.022	.008	-.024	-2.894	.004	.747	1.339
Current Ratio (CR)	-.044	.008	-.046	-5.564	.000	.728	1.373
Growth of Total Assets (gTA)	-.047	.007	-.049	-6.439	.000	.850	1.177
Market-to-Book (MB)	.155	.008	.164	20.153	.000	.757	1.321
Retained Earnings to Equity (REE)	-.774	.013	-.818	-60.275	0.000	.271	3.694
Long Term debt-to-Total Assets (LTDTA)	.006	.009	.005	.642	.521	.819	1.221
Total Debt to Equity (DE)	.066	.008	.068	7.857	.000	.656	1.524
Corporate Taxation (TAX)	.328	.007	.346	44.642	0.000	.829	1.207
Institutional Ownership (ISOWN)	-.060	.011	-.049	-5.570	.000	.644	1.554
Insider Ownership (INSIDE)	-.051	.012	-.036	-4.287	.000	.727	1.376
Log of Total Assets (log TA)	.109	.010	.115	10.840	.000	.445	2.246
2001	-.063	.017	-.027	-3.708	.000	.932	1.073
Crisis	-.080	.031	-.038	-2.592	.010	.231	4.337
Crisis*Systematic risk (Crisis*SYS)	-.016	.014	-.010	-1.173	.241	.669	1.496
Crisis*Unsystematic risk(Crisis*UNSYS)	-.021	.018	-.011	-1.188	.235	.613	1.631

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
Crisis*Cash Flow (Crisis*FCFTA)	.000	.014	.000	.028	.978	.949	1.054
Crisis*Growth of Total Assets (Crisis*gTA)	-.023	.013	-.014	-1.847	.065	.856	1.169
Crisis*Leverage (Crisis*LTDTA)	.038	.026	.016	1.484	.138	.427	2.343
Crisis*Institutional Ownership (Crisis*ISOWN)	.083	.021	.044	3.966	.000	.412	2.425
Crisis*Firm Size (Crisis*log TA)	.057	.018	.027	3.200	.001	.715	1.398
Dependent Variable: Dividend payout ratio							

Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Earned Capital/Total Assets (RETA) is the ratio of retained earnings to total assets. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. 2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, ISOWN and log TA). A dummy variable for Time is used in the regression.

N.B. The results of the Pearson correlation bivariate analysis are omitted due to issues of space but are available upon request.

5.1.5 Panel Unit Root Test Results

The panel unit root test results are presented in **Table 5-5** below.

Table 5-5: Levin, Lin, and Chu Panel Unit Root Test[9] - Listed UK Non-financial Sample

This table presents the results of the Levin, Lin and Chu test for 1340 UK companies in the period 1991-2014.

Variable	t-statistic
Dividend Payout Ratio (DPR)	-2823.14***
Systematic Risk (SYS)	-2824.62***
Unsystematic Risk (UNSYS)	-316.514***
Profit/Total Assets (NOPATTA)	-203.200***
Free Cash Flow/Total Assets (FCFTA)	-732.475***
Cash Flow per Share (CFPS)	-82.133***
Liquidity (CASHTA)	-822.163***
Liquidity (CR)	-342.790***
Firm Growth (GTA)	-90.297***
Firm Growth (MB)	-546.363***
Earned Capital/Equity (REE)	-164.308***
Leverage (LTDTA)	-323.709***
Leverage (DE)	-139.253***
Corporate Tax (TAX)	-116.712***
Institutional Ownership (ISOWN)	-329.328***
Insider Ownership (INSIDE)	-135.824***
Size (log TA)	-115.782***
Time	-220.019***
Systematic risk*Profitability (SYS*Profit)	-399.857***
Systematic risk*Cash Flow (SYS*FCFTA)	-281.291***
Systematic risk*CFPS (SYS*CFPS)	-182.068***
Systematic risk*Liquidity (SYS*CASHTA)	-650.828***
Systematic risk*Liquidity (SYS*CR)	-60.395***
Systematic risk* Firm Growth (SYS*g TA)	-916.598***
Systematic risk*Firm Growth (SYS*MB)	-220.990***
Systematic risk*Earned Capital (SYS*REE)	-352.224***
Systematic risk*Leverage (SYS*LTDTA)	-4338.59***
Systematic risk*Leverage (SYS*DE)	-343.929***

[9]The unit root test is conducted at the series level. An individual intercept that includes individual fixed effects is selected and automatic selection of the number of lags to be included is performed using the Schwarz criterion.
*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Variable	t-statistic
Systematic risk*Corporate Taxation (SYS*TAX)	-519.455***
Systematic risk*Institutional Ownership (SYS*ISOWN)	-641.567***
Systematic risk*Insider Ownership (SYS*INSIDE)	-2814.29***
Systematic risk*Firm Size (SYS* Log TA)	-6046.98***
Unsystematic risk*Profitability (UNSYS*Profit)	-423.025***
Unsystematic risk*Cash Flow (UNSYS*FCFTA)	-2080.60***
Unsystematic risk*CFPS (UNSYS*CFPS)	-182.068***
Unsystematic risk*Liquidity (UNSYS*CASHTA)	-311.901***
Unsystematic risk*Liquidity (UNSYS*CR)	-32.242***
Unsystematic risk* Firm Growth (UNSYS*g TA)	-115.501***
Unsystematic risk*Firm Growth (UNSYS*MB)	-188.441***
Unsystematic risk*Earned Capital (UNSYS*REE)	-1186.17***
Unsystematic risk*Leverage (UNSYS*LTDTA)	-246.829***
Unsystematic risk*Leverage (UNSYS*DE)	-1054.24***
Unsystematic risk*Corporate Taxation (UNSYS*TAX)	-732.907***
Unsystematic risk*Institutional Ownership (UNSYS*ISOWN)	-108.395***
Unsystematic risk*Insider Ownership (UNSYS*INSIDE)	-283.401***
Unsystematic risk*Firm Size (UNSYS* Log TA)	221.054***
2001	-66.126***
Crisis	-1.845**
Crisis*Systematic Risk (Crisis*SYS)	-376.692***
Crisis*Unsystematic Risk (Crisis*UNSYS)	-247.669***
Crisis*Cash Flow (Crisis*FCFTA)	-197.191***
Crisis* Firm Growth (Crisis*g TA)	-155.569***
Crisis* Leverage (Crisis*LTDTA)	-25.023***
Crisis* Firm Size (Crisis*Log TA)	-4750.13***
Crisis* Institutional Ownership (Crisis*ISOWN)	-714.658***

DPR is the dividend payout ratio. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CFPS, CASHTA, CR, gTA, MB, REE, LTDTA, DE, TAX, ISOWN, INSIDE and log TA).2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, gTA, LTDTA, log TA and ISOWN).

The t-statistics of all dependent and independent variables are significant at the 1% level, except in the case of the dummy variable Crisis, for which the test is significant at the 5% level. This leads to the rejection of the null hypothesis. That is, there is no unit root and all variables follow a stationary trend.

5.1.6 Heteroscedasticity – White Test Results

The results of the White test (cross-products) are presented in Tables 5-6 and 5-7.

Table 5-6: White Test (Cross-products) – Model (1)

This table presents the results for the White (cross-products) test for heteroscedasticity for Model (1), covering the determinants of the dividend payout ratio and firm risk interaction variables.

Heteroscedasticity Test: White			
F-statistic	34.518	Prob. F(125,2485)	0
Obs*R-squared	**1216.937**	Prob. Chi-Square(125)	0
Scaled explained SS	1647.745	Prob. Chi-Square(125)	0

The LM-Stat (1216.937) is bigger than the critical value and the p-value for the LM-test is 0.00, both suggesting evidence of heteroscedasticity.

Table 5-7: White Test (Cross-products) – Model (2)

This table presents the results for the White (cross-products) test for heteroscedasticity for Model (2), covering the determinants of the dividend payout ratio and the financial crisis interaction variables.

Heteroscedasticity Test: White			
F-statistic	7.199	Prob. F(125,12012)	0
Obs*R-squared	**1791.715**	Prob. Chi-Square(283)	0
Scaled explained SS	2147.097	Prob. Chi-Square(283)	0

The LM-Stat (1791.175) is bigger than the critical value and the p-value for the LM-test is 0.00, both suggesting evidence of heteroscedasticity.

N.B. The advantage of the GMM is that the model does not need to be homoskedastic (Hansen, 1982; Arellanno & Bond, 1991; Arellanno & Bover, 1995).

5.1.7 Durbin-Watson Test Results

Using Durbin-Watson (DW) Statistic: 5% significance points of dL and dU

To test for positive serial correlation: $H_{0:}$ p= o no autocorrelation, H_a: p>0 positive correlation

To Test for negative serial correlation: $H_{0:}$ p= o no autocorrelation, H_a: p<0 negative autocorrelation.

Table 5- 8- Durbin Watson Test Results

	Durbin- Watson Statistic-d	dU	dL	4-dL	4-dU	Result	Conclusion
All Sample	2.989	1.94668	1.90629	2.09371	2.05332	d>4-dL	Negative Serial Autocorrelation
Above Average DPR	2.67	1.94668	1.90629	2.09371	2.05332	d>4-dL	Negative Serial Autocorrelation
Below Average DPR	2.52	1.94668	1.90629	2.09371	2.05332	d>4-dL	Negative Serial Autocorrelation
Above Average MC	2.54	1.94668	1.90629	2.09371	2.05332	d>4-dL	Negative Serial Autocorrelation
Below Average MC	2.56	1.94668	1.90629	2.09371	2.05332	d>4-dL	Negative Serial Autocorrelation
Industrial	2.98	1.94668	1.90629	2.09371	2.05332	d>4-dL	Negative Serial Autocorrelation
Technology	3.04	1.94119	1.88319	2.11681	2.05881	d>4-dL	Negative Serial Autocorrelation
Services	3.02	1.94119	1.88319	2.11681	2.05881	d>4-dL	Negative Serial Autocorrelation
Utilities	2.84	1.96077	1.64382	2.35618	2.03923	d>4-dL	Negative Serial Autocorrelation
Other Industries	2.98	1.94668	1.90629	2.09371	2.05332	d>4-dL	Negative Serial Autocorrelation

N.B. The advantage of the GMM is that the model does not need to be serially independent (Hansen, 1982; Arellanno & Bond, 1991; Arellanno & Bover, 1995).

5.1.8 Hausman Test for Endogeneity

The Hausman test for Endogeneity is run for two models. Model (1) focuses on determinants of the dividend payout ratio and interaction variables for systematic and unsystematic risks. Model (2) covers determinants of the dividend payout ratio and the interaction variables of the crisis period.

The test is conducted by running two regressions. The first regression is run with each explanatory variable as a dependent variable. The residuals from the first regression are saved and a series of fitted values are created by constructing new variables that are equal to the actual values minus the residuals. The fitted value for each explanatory variable is regressed on the dependent variable, which is the dividend payout ratio in the second regression.

The fitted values for all explanatory variables are significant in the dividend payout ratio (DPR) equation, suggesting that all explanatory variables are endogenous except for the fitted value of total debt to equity (DE). This indicates that this interaction variable is exogenous for DPR.

N.B. The results of the Hausman test for endogeneity are available upon request (omitted due to space issues).

5.2 Descriptive Statistics

This section presents the descriptive statistics (mean, median, standard deviation and number of observations) of the dependent and all explanatory variables for the 1340 UK companies in the period 1991-2014.**Table 5-8** shows the descriptive statistics for the entire sample of UK companies. **Table 5-9** shows the descriptive statistics for companies classified according to their dividend payout ratio. **Table 5-10** reports the descriptive statistics for firms classified according to firm size. **Table 5-11** reports the descriptive statistics for industrial and technology sector firms. **Table 5-12** reports the descriptive statistics for utility and service sector firms. **Table 5-13** reports the descriptive statistics for firms in other sectors. **Table 5-14** reports the descriptive statistics for de-listed companies.

Table 5-9: Summary Statistics of Dividend Payout Ratio and Key Dividend Policy Determinants and Interaction Variables (Entire Sample)

This table presents the summary statistics for the dividend payout ratio, dividend policy determinants and interaction variables, for a sample of 1340 UK companies in the period 1991-2014.

Variable	Mean	Median	STDEV	Count
Dividend Payout Ratio (DPR)	0.305	0.240	0.422	12,296
Systematic Risk (SYS)	0.029	0.026	0.037	12,296
Unsystematic Risk (UNSYS)	0.072	0.058	0.051	12,296
Profitability (NOPATTA)	0.063	0.068	0.083	12,296
Free Cash Flow-to-Total Assets (FCFTA)	0.168	0.093	0.677	12,296
Cash Flow per Share (CFPS)	0.804	0.256	2.828	12,296
Cash –to-Total Assets (CASHTA)	0.103	0.057	0.201	12,296
Current Ratio (CR)	1.577	1.370	0.999	12,296
Growth of Total Assets (gTA)	0.193	0.075	1.302	12,296
Market-to-Book Ratio (MB)	2.721	1.614	5.820	12,296
Retained Earnings- to –Equity (REE)	0.115	0.120	0.252	12,296
Long term debt- to- total assets (LTDTA)	0.046	0.000	0.078	12,296
Debt –to- equity (DE)	0.451	0.306	0.601	12,296
Corporate Taxation (TAX)	0.248	0.286	0.165	12,296
Institutional Ownership (ISOWN)	0.062	0.000	0.113	12,296
Insider Ownership (INSIDE)	0.026	0.000	0.071	12,296
Log of Total Assets (log TA)	5.117	4.958	0.932	12,296
Time	6.053	5.000	4.269	12,296

Variable	Mean	Median	STDEV	Count
Systematic Risk*Profitability (SYS*NOPATTA)	0.002	0.001	0.005	12,296
Systematic Risk *Free cash flow to total assets (SYS*FCFTA)	0.004	0.001	0.028	12,296
Systematic Risk *Cash flow per share (SYS*CFPS)	0.024	0.005	0.124	12,296
Systematic Risk *Cash -to -total assets (SYS*CASHTA)	0.003	0.001	0.008	12,296
Systematic Risk *Current ratio (SYS*CR)	0.047	0.032	0.079	12,296
Systematic Risk *Growth of total assets (SYS*G TA)	0.010	0.001	0.065	12,296
Systematic Risk *Market-to book ratio (SYS*MB)	0.085	0.035	0.343	12,296
Systematic Risk *Long term debt-to-total assets (SYS*LTDTA)	0.002	0.000	0.004	12,296
Systematic Risk *Debt to equity (SYS*DE)	0.014	0.004	0.036	12,296
Systematic Risk*Retained earnings to equity (SYS*REE)	0.003	0.002	0.014	12,296
Systematic Risk*Corporate taxation (SYS*TAX)	0.007	0.005	0.012	12,296
Systematic Risk*Institutional ownership (SYS*ISOWN)	0.002	0.000	0.006	12,296
Systematic Risk*Insider ownership (SYS*INSIDE)	0.001	0.000	0.004	12,296
Systematic Risk*Log of total assets (SYS*log TA)	0.156	0.129	0.193	12,296
Unsystematic Risk *Profitability (UNSYS*NOPATTA)	0.011	0.005	0.057	12,296
Unsystematic Risk *Free cash flow-total assets (UNSYS*FCFTA)	0.039	0.013	0.179	12,296
Unsystematic Risk *Cash flow per share (UNSYS*CFPS)	0.008	0.003	0.019	12,296
Unsystematic Risk *Cash to total assets (UNSYS*CASHTA)	0.116	0.079	0.133	12,296
Unsystematic Risk *Current ratio (UNSYS*CR)	0.003	0.003	0.010	12,296
Unsystematic Risk *Growth of total assets (UNSYS*g TA)	0.009	0.004	0.110	12,296
Unsystematic Risk *Market-to- book ratio (UNSYS*MB)	0.199	0.088	0.730	12,296
Unsystematic Risk *Retained earnings (UNSYS*REE)	0.005	0.006	0.029	12,296
Unsystematic Risk *Long term debt- to- total Assets (UNSYS*LTDTA)	0.003	0.000	0.006	12,296
Unsystematic Risk *Total debt- to- equity (UNSYS*DE)	0.033	0.014	0.068	12,296

Variable	Mean	Median	STDEV	Count
Unsystematic Risk *Corporate taxation (UNSYS*TAX)	0.016	0.012	0.018	12,296
Unsystematic Risk *Log of total assets (UNSYS*log TA)	0.350	0.290	0.234	12,296
Unsystematic Risk *Institutional ownership (UNSYS*ISOWN)	0.004	0.000	0.010	12,296
Unsystematic Risk *Insider ownership (UNSYS*INSIDE)	0.002	0.000	0.007	12,296
2001	0.039	0.000	0.193	12,296
Crisis	0.054	0.000	0.227	12,296
Crisis*Systematic risk (Crisis*SYS)	0.003	0.000	0.016	12,296
Crisis*Unsystematic risk (Crisis*UNSYS)	0.005	0.000	0.025	12,296
Crisis*Free Cash Flow- to- total assets (Crisis*FCFTA)	0.007	0.000	0.155	12,296
Crisis*Long term debt –to- total assets (Crisis*LTDTA)	0.003	0.000	0.025	12,296
Crisis*Growth of total assets (Crisis*g TA)	0.014	0.000	0.406	12,296
Crisis*Institutional Ownership (Crisis*ISOWN)	0.009	0.000	0.048	12,296
Crisis*Log of Total Assets (Crisis*log TA)	0.279	0.000	1.182	12,296

DPR is the dividend payout ratio. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CFPS, CASHTA, CR, gTA, MB, REE, LTDTA, DE, TAX, ISOWN, INSIDE and log TA).2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, ISOWN and log TA).

Table 5-10: Summary Statistics, UK Companies Grouped by Dividend Payout Ratio

This table presents the summary statistics for the dividend payout ratio, dividend policy determinants and interaction variables for 1340 UK companies in the period 1991-2014, classified by dividend payout ratio (DPR).

	Above Average DPR				Below Average DPR			
Variable	**Mean**	**Median**	**STDEV**	**Count**	**Mean**	**Median**	**STDEV**	**Count**
Dividend Payout Ratio (DPR)	0.62	0.451	0.539	3337	0.111	0.094	0.105	6680
Systematic Risk (SYS)	0.031	0.028	0.033	3337	0.035	0.017	0.149	6680
Unsystematic Risk (UNSYS)	0.058	0.048	0.04	3337	0.078	0.064	0.054	6680
Profitability (NOPATTA)	0.075	0.067	0.044	3337	0.054	0.07	0.101	6680
Free Cash Flow-to-Total Assets (FCFTA)	0.22	0.109	0.709	3337	0.138	0.078	0.659	6680
Cash Flow per Share (CFPS)	0.489	0.294	0.891	3337	0.346	0.249	3.373	6680
Cash-to-Total Assets (CASHTA)	0.095	0.05	0.265	3337	0.109	0.065	0.127	6680
Current Ratio (CR)	1.427	1.32	0.805	3337	1.685	1.41	1.105	6680
Growth of Total Assets(gTA)	0.134	0.048	1.293	3337	0.241	0.101	1.383	6680
Market-to-Book Ratio (MB)	2.61	1.836	2.929	3337	2.834	1.491	7.093	6680
Earned Capital-to-Equity (REE)	0.099	0.088	0.152	3337	0.121	0.149	0.298	6680
Long Term Debt-to-Total Assets (LTDTA)	0.062	0	0.091	3337	0.042	0	0.072	6680
Debt-to Equity (DE)	0.47	0.382	0.551	3337	0.424	0.262	0.622	6680
Corporate Taxation (TAX)	0.288	0.3	0.135	3337	0.223	0.276	0.17	6680
Institutional Ownership(ISOWN)	0.063	0	0.116	3337	0.066	0	0.113	6680
Insider Ownership (INSIDE)	0.018	0	0.059	3337	0.032	0	0.077	6680
Log of Total Assets (log TA)	5.379	5.296	0.879	3337	4.99	4.845	0.914	6680

	Above Average DPR				Below Average DPR			
Variable	**Mean**	**Median**	**STDEV**	**Count**	**Mean**	**Median**	**STDEV**	**Count**
Systematic risk*Profitability (SYS*NOPATTA)	0.002	0.002	0.003	3337	0.001	0.001	0.006	6680
Systematic risk*Cash flow (SYS*FCF)	0.006	0.002	0.031	3337	0.002	0.001	0.025	6680
Systematic risk*Cash flow (SYS*CFPS)	0.017	0.007	0.052	3337	0.025	0.004	0.132	6680
Systematic risk*Liquidity (SYS*CASHTA)	0.003	0.001	0.008	3337	0.003	0.001	0.008	6680
Systematic risk*Liquidity (SYS*CR)	0.042	0.032	0.06	3337	0.052	0.032	0.089	6680
Systematic risk*Firm growth (SYS*gTA)	0.008	0.001	0.06	3337	0.012	0.001	0.072	6680
Systematic risk*Firm growth (SYS*MB)	0.082	0.048	0.157	3337	0.088	0.029	0.418	6680
Systematic risk*Leverage (SYS*LTDTA)	0.002	0	0.005	3337	0.001	0	0.004	6680
Systematic risk*Leverage (SYS*DE)	0.016	0.007	0.034	3337	0.012	0.003	0.037	6680
Systematic risk*Earned capital(SYS*REE)	0.003	0.002	0.008	3337	0.003	0.003	0.016	6680
Systematic risk*TAX	0.009	0.007	0.012	3337	0.006	0.004	0.011	6680
Systematic risk* Institutional Ownership (SYS*ISOWN)	0.002	0	0.005	3337	0.002	0	0.006	6680
Systematic risk* Insider Ownership (SYS*INSIDE)	0.001	0	0.003	3337	0.001	0	0.004	6680
Systematic risk*Firm Size (SYS*log TA)	0.17	0.148	0.186	3337	0.151	0.122	0.196	6680
Unsystematic risk*Profitability (UNSYS*NOPATTA)	0.004	0.003	0.004	3337	0.002	0.003	0.012	6680
Unsystematic risk*Cash flow (UNSYS*FCFTA)	0.013	0.005	0.058	3337	0.009	0.004	0.054	6680
Unsystematic risk*Cash Flow (UNSYS*CFPS)	0.024	0.013	0.049	3337	0.046	0.013	0.224	6680
Unsystematic risk*Liquidity (UNSYS*CASHTA)	0.006	0.002	0.023	3337	0.009	0.004	0.015	6680
Unsystematic risk*Liquidity (UNSYS*CR)	0.084	0.06	0.084	3337	0.135	0.089	0.156	6680
Unsystematic risk*Firm Growth (UNSYS*gTA)	0.002	0.002	0.082	3337	0.012	0.005	0.128	6680
Unsystematic risk*Firm Growth (UNSYS*MB)	0.139	0.082	0.212	3337	0.233	0.089	0.939	6680

	Above Average DPR				Below Average DPR			
Variable	**Mean**	**Median**	**STDEV**	**Count**	**Mean**	**Median**	**STDEV**	**Count**
Unsystematic risk*Leverage (UNSYS*LTDTA)	0.003	0	0.006	3337	0.003	0	0.006	6680
Unsystematic risk*Leverage (UNSYS*DE)	0.026	0.014	0.042	3337	0.035	0.013	0.078	6680
Unsystematic risk*Earned Capital (UNSYS*REE)	0.005	0.004	0.011	3337	0.005	0.007	0.036	6680
Unsystematic risk*Corporate Taxation (UNSYS*TAX)	0.017	0.013	0.015	3337	0.015	0.012	0.019	6680
Unsystematic Risk * Institutional Ownership (UNSYS*ISOWN)	0.003	0	0.008	3337	0.005	0	0.011	6680
Unsystematic Risk * Insider Ownership (UNSYS*INSIDE)	0.001	0	0.005	3337	0.003	0	0.009	6680
Unsystematic risk*Firm Size (UNSYS*Log TA)	0.299	0.249	0.2	3337	0.372	0.308	0.245	6680
Time	5.012	4	3.267	3337	5.806	5	4.115	6680
2001	0.034	0	0.182	3337	0.043	0	0.202	6680
Crisis	0.051	0	0.22	3337	0.061	0	0.24	6680
Crisis*Systematic risk (Crisis*SYS)	0.003	0	0.016	3337	0.003	0	0.017	6680
Crisis*Unsystematic risk (Crisis*UNSYS)	0.003	0	0.018	3337	0.006	0	0.029	6680
Crisis*Cash flow (Crisis*FCF)	0.009	0	0.164	3337	0.004	0	0.122	6680
Crisis*Leverage (Crisis*LTDTA)	0.005	0	0.032	3337	0.003	0	0.024	6680
Crisis*Firm Growth (Crisis*gTA)	0.009	0	0.409	3337	0.019	0	0.434	6680
Crisis*Institutional ownership (Crisis*ISOWN)	0.009	0	0.048	3337	0.01	0	0.049	6680
Crisis*Firm size (Crisis*log TA)	0.282	0	1.231	3337	0.303	0	1.206	6680

DPR is the dividend payout ratio. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets.

Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CFPS, CASHTA, CR, gTA, MB, REE, LTDTA, DE, TAX, ISOWN, INSIDE and log TA).2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, ISOWN and log TA).

Table 5- 11: Summary Statistics, UK Companies Grouped by Firm Size

This table presents the summary statistics for the dividend payout ratio, dividend policy determinants and interaction variables for 1340 UK companies in the period 1991-2014, classified by firm size (log of market capitalization).

	Above Average MC				**Below Average MC**			
Variable	**Mean**	**Median**	**STDEV**	**Count**	**Mean**	**Median**	**STDEV**	**Count**
Dividend Payout Ratio (DPR)	0.332	0.264	0.429	5520	0.291	0.230	0.409	6183
Systematic Risk (SYS)	0.034	0.030	0.035	5520	0.025	0.021	0.037	6183
Unsystematic Risk (UNSYS)	0.060	0.047	0.045	5520	0.080	0.067	0.052	6183
Profitability (NOPATTA)	0.069	0.071	0.077	5520	0.061	0.067	0.084	6183
Free Cash Flow-to-Total Assets (FCFTA)	0.238	0.091	0.905	5520	0.104	0.094	0.336	6183
Cash Flow per Share (CFPS)	1.057	0.361	2.806	5520	0.536	0.200	2.390	6183
Cash-to-Total Assets (CASHTA)	0.097	0.061	0.108	5520	0.107	0.052	0.260	6183
Current Ratio (CR)	1.619	1.390	0.995	5520	1.532	1.360	0.981	6183

Variable	Above Average MC				Below Average MC			
	Mean	Median	STDEV	Count	Mean	Median	STDEV	Count
Growth of Total Assets (g TA)	0.351	0.143	1.771	5520	0.086	0.060	0.592	6183
Market-to-Book Ratio (MB)	3.180	1.815	7.450	5520	2.379	1.482	3.333	6183
Earned Capital-to-Equity (REE)	0.131	0.129	0.204	5520	0.106	0.114	0.279	6183
Long Term Debt-to-Total Assets (LTDTA)	0.079	0.040	0.091	5520	0.017	0.000	0.048	6183
Debt-to Equity (DE)	0.427	0.310	0.545	5520	0.476	0.306	0.640	6183
Corporate Taxation (TAX)	0.256	0.282	0.158	5520	0.247	0.295	0.166	6183
Institutional Ownership (ISOWN)	0.094	0.000	0.128	5520	0.033	0.000	0.090	6183
Insider Ownership (INSIDE)	0.034	0.000	0.077	5520	0.018	0.000	0.061	6183
Log of Total Assets (log TA)	5.585	5.491	0.959	5520	4.718	4.666	0.669	6183
Time	6.673	6.000	4.597	5520	5.159	5.000	3.364	6183
Systematic risk*Profitability (SYS*PROFIT)	0.002	0.002	0.005	5520	0.000	0.000	0.004	6183
Systematic risk*Cash flow (SYS*FCF)	0.006	0.002	0.039	5520	0.000	0.000	0.014	6183
Systematic risk*Cash flow (SYS*CFPS)	0.036	0.009	0.146	5520	0.011	0.003	0.086	6183
Systematic risk*Liquidity (SYS*CASHTA)	0.003	0.001	0.007	5520	0.000	0.000	0.008	6183
Systematic risk*Liquidity (SYS*CR)	0.056	0.038	0.079	5520	0.039	0.024	0.074	6183
Systematic risk*Firm growth (SYS*GTA)	0.019	0.003	0.089	5520	0.001	0.000	0.024	6183
Systematic risk*Firm growth (SYS*MB)	0.111	0.050	0.442	5520	0.005	0.003	0.151	6183
Systematic risk*Earned capital(SYS*REE)	0.004	0.003	0.011	5520	0.002	0.002	0.015	6183
Systematic risk*Leverage (SYS*LTDTA)	0.003	0.000	0.005	5520	0.000	0.000	0.002	6183
Systematic risk*Leverage (SYS*DE)	0.015	0.006	0.032	5520	0.013	0.003	0.040	6183
Systematic risk*Corporate taxation (SYS*TAX)	0.009	0.007	0.012	5520	0.006	0.004	0.012	6183
Systematic Risk* Institutional ownership (SYS*ISOWN)	0.003	0.000	0.007	5520	0.000	0.000	0.004	6183
Systematic Risk* Insider ownership (SYS*INSIDE)	0.001	0.000	0.004	5520	0.000	0.000	0.002	6183
Systematic risk*Firm size (SYS*LOGTA)	0.194	0.171	0.196	5520	0.000	0.000	0.013	6183

	Above Average MC				Below Average MC			
Variable	**Mean**	**Median**	**STDEV**	**Count**	**Mean**	**Median**	**STDEV**	**Count**
Unsystematic risk*Profitability (UNSYS*PROFIT)	0.003	0.003	0.008	5520	-0.001	0.000	0.006	6183
Unsystematic risk*Cash flow (UNSYS*FCF)	0.015	0.003	0.073	5520	-0.001	0.000	0.019	6183
Unsystematic risk*Cash flow (UNSYS*CFPS)	0.044	0.015	0.138	5520	0.032	0.011	0.183	6183
Unsystematic risk*Liquidity (UNSYS*CASHTA)	0.007	0.003	0.012	5520	0.000	0.000	0.009	6183
Unsystematic risk*Liquidity (UNSYS*CR)	0.104	0.065	0.128	5520	0.123	0.089	0.129	6183
Unsystematic risk*Firm growth (UNSYS*gTA)	0.014	0.006	0.138	5520	-0.002	0.000	0.038	6183
Unsystematic risk*Firm growth (UNSYS*MB)	0.217	0.079	0.938	5520	-0.008	0.000	0.172	6183
Unsystematic risk*Leverage (UNSYS*LTDTA)	0.004	0.002	0.007	5520	0.001	0.000	0.004	6183
Unsystematic risk*Leverage (UNSYS*DE)	0.023	0.012	0.042	5520	0.042	0.017	0.082	6183
Unsystematic risk*Earned capital (UNSYS*REE)	0.006	0.005	0.019	5520	-0.003	0.000	0.020	6183
Unsystematic risk*Institutional ownership (UNSYS*ISOWN)	0.006	0.000	0.011	5520	0.000	0.000	0.005	6183
Unsystematic risk*Insider ownership (UNSYS*INSIDE)	0.003	0.000	0.007	5520	0.000	0.000	0.003	6183
Unsystematic risk*Firm size (UNSYS*LOGTA)	0.315	0.259	0.217	5520	0.372	0.312	0.237	6183
2001	0.033	0.000	0.178	5520	0.045	0.000	0.207	6183
Crisis	0.077	0.000	0.266	5520	0.031	0.000	0.174	6183
Crisis*Systematic risk (Crisis*SYS)	0.004	0.000	0.019	5520	0.001	0.001	0.009	6183
Crisis*Unsystematic risk (Crisis*UNSYS)	0.006	0.000	0.027	5520	0.001	0.000	0.012	6183
Crisis*Cash flow (Crisis*FCF)	0.009	0.000	0.046	5520	0.000	0.003	0.025	6183
Crisis*Leverage (Crisis*LTDTA)	0.006	0.000	0.035	5520	0.001	0.002	0.010	6183
Crisis*Firm Growth (Crisis*GTA)	0.037	0.000	0.563	5520	-0.003	0.007	0.158	6183
Crisis*Institutional Ownership (Crisis*ISOWN)	0.013	0.000	0.057	5520	0.005	0.003	0.028	6183
Crisis*Firm Size (Crisis*log TA)	0.412	0.000	1.451	5520	0.147	0.000	0.829	6183

DPR is the dividend payout ratio. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CFPS, CASHTA, CR, gTA, MB, REE, LTDTA, DE, TAX, ISOWN, INSIDE and log TA).2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, ISOWN and log TA).

Table 5-12: Summary Statistics, UK Industrial and Technology Sector Companies

This table presents the summary statistics for the dividend payout ratio, dividend policy determinants and interaction variables for UK industrial and technology sector companies in the period 1991-2014.

	Industrial				Technology			
Variable	**Mean**	**Median**	**STDEV**	**Count**	**Mean**	**Median**	**STDEV**	**Count**
Dividend Payout Ratio (DPR)	0.311	0.253	0.391	4807	0.214	0.108	0.360	1397
Systematic Risk (SYS)	0.030	0.026	0.036	4807	0.038	0.032	0.044	1397
Unsystematic Risk (UNSYS)	0.072	0.059	0.051	4807	0.086	0.073	0.054	1397
Profitability (NOPATTA)	0.065	0.069	0.080	4807	0.054	0.067	0.107	1397
Cash Flow(FCFTA)	0.185	0.096	0.744	4807	0.116	0.081	0.495	1397
Cash Flow per Share (CFPS)	0.678	0.244	2.480	4807	0.488	0.125	2.466	1397
Earned Capital/Equity (REE)	0.130	0.132	0.238	4807	0.095	0.113	0.318	1397
Liquidity (CASHTA)	0.101	0.066	0.116	4807	0.167	0.117	0.158	1397
Liquidity(CR)	1.588	1.410	0.904	4807	1.835	1.520	1.126	1397
Leverage (LTDTA)	0.050	0.000	0.080	4807	0.028	0.000	0.060	1397
Leverage (DE)	0.440	0.325	0.540	4807	0.305	0.108	0.606	1397
Firm Growth (MB)	2.673	1.685	6.431	4807	3.999	2.046	8.753	1397
Firm Growth (g TA)	0.163	0.067	1.394	4807	0.205	0.116	1.304	1397
Corporate Tax (TAX)	0.258	0.294	0.163	4807	0.199	0.244	0.195	1397
Institutional Ownership (ISOWN)	0.064	0.000	0.112	4807	0.088	0.000	0.126	1397
Insider Ownership (INSIDE)	0.026	0.000	0.069	4807	0.050	0.000	0.090	1397
Firm Size (Log TA)	5.063	4.956	0.869	4807	4.852	4.590	0.988	1397
Systematic Risk * Profitability (SYS*NOPATTA)	0.002	0.001	0.005	4807	0.001	0.002	0.007	1397
Systematic Risk * Cash Flow (SYS*FCF)	0.005	0.003	0.034	4807	0.014	0.000	0.057	1397
Systematic Risk * Cash Flow (SYS*CFPS)	0.003	0.001	0.028	4807	0.008	0.000	0.040	1397
Systematic Risk * Liquidity (SYS*CASHTA)	0.000	0.000	0.004	4807	0.002	0.002	0.007	1397

Variable	Industrial				Technology			
	Mean	Median	STDEV	Count	Mean	Median	STDEV	Count
Systematic Risk * Liquidity (SYS*CR)	-0.001	0.000	0.028	4807	0.004	0.002	0.029	1397
Systematic Risk * Firm growth (SYS*GTA)	0.021	0.005	0.101	4807	0.020	0.003	0.114	1397
Systematic Risk * Firm growth (SYS*MB)	0.000	0.000	0.004	4807	0.006	0.003	0.012	1397
Systematic Risk * Earned capital (SYS*REE)	0.003	0.001	0.317	4807	0.160	0.052	0.535	1397
Systematic Risk * Leverage (SYS*LTDTA)	0.047	0.035	0.073	4807	0.073	0.048	0.111	1397
Systematic Risk * Leverage (SYS*DE)	0.005	0.001	0.052	4807	0.011	0.002	0.079	1397
Systematic Risk * Corporate taxation (SYS*Tax)	0.000	0.000	0.010	4807	0.004	0.003	0.019	1397
Systematic Risk * Institutional ownership (SYS*ISOWN)	0.157	0.129	0.188	4807	0.189	0.153	0.220	1397
Systematic Risk * Insider ownership (SYS*INSIDE)	0.000	0.000	0.004	4807	0.003	0.000	0.008	1397
Systematic Risk * Firm size (SYS*LOGTA)	0.008	0.006	0.012	4807	0.008	0.004	0.015	1397
Unsystematic Risk * Profitability (UNSYS*NOPATTA)	0.000	0.000	0.003	4807	0.002	0.000	0.005	1397
Unsystematic Risk * Cash flow (UNSYS*FCF)	-0.001	0.000	0.006	4807	0.003	0.004	0.013	1397
Unsystematic Risk * Cash flow (UNSYS*CFPS)	-0.001	0.000	0.037	4807	0.008	0.005	0.041	1397
Unsystematic Risk * Liquidity (UNSYS*CASHTA)	0.032	0.012	0.133	4807	0.035	0.008	0.229	1397
Unsystematic Risk * Liquidity (UNSYS*CR)	0.000	0.000	0.006	4807	0.015	0.008	0.020	1397
Unsystematic Risk * Firm growth (UNSYS*GTA)	0.116	0.082	0.132	4807	0.163	0.115	0.164	1397
Unsystematic Risk * Firm growth (UNSYS*MB)	-0.006	0.000	0.073	4807	0.013	0.008	0.126	1397
Unsystematic Risk * Earned capital (UNSYS*REE)	0.347	0.288	0.229	4807	0.401	0.343	0.242	1397
Unsystematic Risk * Leverage (UNSYS*LTDTA)	0.003	0.002	0.492	4807	0.363	0.145	1.025	1397
Unsystematic Risk * Leverage (UNSYS*DE)	0.017	0.013	0.019	4807	0.016	0.012	0.022	1397
Unsystematic Risk * Corporate taxation (UNSYS*TAX)	-0.003	0.000	0.016	4807	0.004	0.007	0.040	1397
Unsystematic Risk * Institutional ownership (UNSYS*ISOWN)	0.000	0.000	0.004	4807	0.004	0.000	0.009	1397
Unsystematic Risk * Insider ownership (UNSYS*INSIDE)	0.000	0.004	0.167	4807	0.005	0.000	0.031	1397

	Industrial				Technology			
Variable	**Mean**	**Median**	**STDEV**	**Count**	**Mean**	**Median**	**STDEV**	**Count**
Unsystematic Risk * Firm size (UNSYS*LOGTA)	0.000	0.000	0.006	4807	0.007	0.000	0.012	1397
2001	0.049	0.000	0.217	4807	0.034	0.000	0.180	1397
Crisis	0.043	0.000	0.203	4807	0.083	0.000	0.276	1397
Crisis*Systematic Risk (Crisis*SYS)	0.002	0.000	0.013	4807	0.004	0.000	0.020	1397
Crisis*Unsystematic Risk (Crisis*UNSYS)	0.005	0.000	0.025	4807	0.007	0.000	0.027	1397
Crisis*Cash flow (Crisis*FCF)	0.005	0.000	0.034	4807	0.013	0.000	0.062	1397
Crisis*Leverage (Crisis*LTDTA)	0.001	0.000	0.062	4807	0.007	0.000	0.056	1397
Crisis*Firm Growth (Crisis*GTA)	0.060	0.000	0.385	4807	0.240	0.000	2.947	1397
Crisis*Institutional Ownership (Crisis*ISOWN)	0.022	0.000	0.171	4807	0.013	0.000	0.085	1397
Crisis*Firm Size (log TA)	0.304	0.000	1.226	4807	0.402	0.000	1.359	1397

DPR is the dividend payout ratio. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CFPS, CASHTA, CR, gTA, MB, REE, LTDTA, DE, TAX, ISOWN, INSIDE and log TA).2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, ISOWN and log TA).

Table 5-13: Summary Statistics, UK Services and Utility Sector Companies

This table presents the summary statistics for the dividend payout ratio, the dividend yield and dividend policy determinants for UK service and utility sector companies in the period 1991-2014.

	Services				Utilities			
Variable	**Mean**	**Median**	**STDEV**	**Count**	**Mean**	**Median**	**STDEV**	**Count**
Dividend Payout Ratio (DPR)	0.329	0.238	0.535	2367	0.334	0.296	0.240	269
Systematic Risk (SYS)	0.028	0.023	0.036	2367	0.017	0.017	0.027	269
Unsystematic Risk (UNSYS)	0.074	0.060	0.050	2367	0.051	0.040	0.040	269
Profitability (NOPATTA)	0.058	0.065	0.090	2367	0.085	0.087	0.041	269
Cash Flow(FCFTA)	0.137	0.096	0.484	2367	0.182	0.127	0.450	269
Cash Flow per Share (CFPS)	0.671	0.236	2.442	2367	2.716	0.947	5.748	269
Earned Capital/Equity (REE)	0.097	0.106	0.303	2367	0.142	0.142	0.116	269
Liquidity (CASHTA)	0.094	0.046	0.121	2367	0.033	0.013	0.049	269
Liquidity(CR)	1.375	1.120	1.067	2367	1.142	1.050	0.691	269
Leverage (LTDTA)	0.037	0.000	0.073	2367	0.042	0.000	0.083	269
Leverage (DE)	0.535	0.347	0.725	2367	0.852	0.432	1.096	269
Firm Growth (MB)	2.883	1.676	4.462	2367	1.692	1.463	1.253	269
Firm Growth (g TA)	0.199	0.073	0.877	2367	0.155	0.076	0.948	269
Corporate Tax (TAX)	0.244	0.285	0.169	2367	0.225	0.242	0.135	269
Institutional Ownership (ISOWN)	0.057	0.000	0.114	2367	0.042	0.000	0.107	269
Insider Ownership (INSIDE)	0.024	0.000	0.071	2367	0.000	0.000	0.006	269
Firm Size (Log TA)	5.031	4.924	0.861	2367	6.295	6.354	0.888	269
Systematic Risk * Profitability (SYS*NOPATTA)	0.219	0.000	1.045	2367	0.001	0.001	0.002	269
Systematic Risk * Cash Flow (SYS*FCF)	0.008	0.000	0.049	2367	0.002	0.001	0.006	269
Systematic Risk * Cash Flow (SYS*CFPS)	0.004	0.000	0.031	2367	0.045	0.017	0.225	269

Variable	Services				Utilities			
	Mean	Median	STDEV	Count	Mean	Median	STDEV	Count
Systematic Risk * Liquidity (SYS*CASHTA)	0.001	0.001	0.005	2367	0.001	0.00	0.002	269
Systematic Risk * Liquidity (SYS*CR)	0.003	0.001	0.022	2367	0.021	0.016	0.035	269
Systematic Risk * Firm growth (SYS*GTA)	0.671	0.236	2.441	2367	0.004	0.001	0.031	269
Systematic Risk * Firm growth (SYS*MB)	0.003	0.001	0.007	2367	0.031	0.021	0.060	269
Systematic Risk * Earned capital (SYS*REE)	0.081	0.035	0.225	2367	0.003	0.002	0.006	269
Systematic Risk * Leverage (SYS*LTDTA)	0.037	0.023	0.067	2367	0.001	0.00	0.002	269
Systematic Risk * Leverage (SYS*DE)	0.007	0.001	0.045	2367	0.013	0.006	0.051	269
Systematic Risk * Corporate taxation (SYS*Tax)	0.002	0.002	0.016	2367	0.004	0.003	0.008	269
Systematic Risk * Institutional ownership (SYS*ISOWN)	0.146	0.118	0.189	2367	0.001	0.00	0.004	269
Systematic Risk * Insider ownership (SYS*INSIDE)	0.002	0.000	0.006	2367	0.000	0.00	0.00	269
Systematic Risk * Firm Size (SYS*LOGTA)	0.007	0.004	0.012	2367	0.115	0.100	0.180	269
Unsystematic Risk * Profitability (UNSYS*NOPATTA)	0.001	0.000	0.004	2367	0.004	0.003	0.004	269
Unsystematic Risk * Cash flow (UNSYS*FCF)	0.003	0.003	0.010	2367	0.009	0.004	0.017	269
Unsystematic Risk * Cash flow (UNSYS*CFPS)	0.010	0.005	0.049	2367	0.123	0.040	0.583	269
Unsystematic Risk * Liquidity (UNSYS*CASHTA)	0.031	0.012	0.122	2367	0.001	0.001	0.003	269
Unsystematic Risk * Liquidity (UNSYS*CR)	0.007	0.003	0.013	2367	0.055	0.055	0.055	269
Unsystematic Risk * Firm growth (UNSYS*GTA)	0.103	0.066	0.121	2367	0.009	0.009	0.057	269
Unsystematic Risk * Firm growth (UNSYS*MB)	0.009	0.004	0.076	2367	0.078	0.078	0.080	269
Unsystematic Risk * Leverage (UNSYS*LTDTA)	0.195	0.098	0.458	2367	0.002	0.002	0.005	269
Unsystematic Risk * Leverage (UNSYS*DE)	0.016	0.013	0.018	2367	0.048	0.048	0.104	269
Unsystematic Risk * Earned capital (UNSYS*REE)	0.356	0.295	0.232	2367	0.006	0.006	0.015	269
Unsystematic Risk * Corporate taxation (UNSYS*Tax)	0.003	0.005	0.034	2367	0.011	0.011	0.013	269
Unsystematic Risk * Firm size (UNSYS*LOGTA)	0.004	0.000	0.010	2367	0.321	0.321	0.261	269
Unsystematic Risk * Institutional ownership (UNSYS*ISOWN)	0.002	0.000	0.007	2367	0.002	0.002	0.005	269

	Services				Utilities			
Variable	**Mean**	**Median**	**STDEV**	**Count**	**Mean**	**Median**	**STDEV**	**Count**
Unsystematic Risk * Insider ownership (UNSYS*INSIDE)	0.001	0.000	0.023	2367	0.000	0.000	0.000	269
2001	0.049	0.000	0.217	2367	0.052	0.000	0.223	269
Crisis	0.043	0.000	0.203	2367	0.026	0.000	0.159	269
Crisis*Systematic risk (Crisis*SYS)	0.002	0.000	0.013	2367	0.001	0.000	0.011	269
Crisis*Unsystematic risk (Crisis*UNSYS)	0.005	0.000	0.025	2367	0.001	0.000	0.006	269
Crisis*Cash flow (Crisis*FCF)	0.005	0.000	0.034	2367	0.001	0.000	0.008	269
Crisis*Leverage (Crisis*LTDTA)	0.001	0.000	0.062	2367	0.001	0.000	0.014	269
Crisis*Firm growth (Crisis*GTA)	0.060	0.000	0.385	2367	0.005	0.000	0.153	269
Crisis*Institutional ownership (Crisis*ISOWN)	0.022	0.000	0.171	2367	0.004	0.000	0.038	269
Crisis*Firm size (Crisis*log TA)	0.219	0.000	1.045	2367	0.181	0.000	1.117	269

DPR is the dividend payout ratio. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CFPS, CASHTA, CR, gTA, MB, REE, LTDTA, DE, TAX, ISOWN, INSIDE and log TA).2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, ISOWN and log TA).

Table 5-14: Summary Statistics, UK Companies from Other Sectors

This table presents the summary statistics for the dividend payout ratio, dividend policy determinants and interaction variables for UK companies from other sectors in the period 1991-2014.

	Other Industries			
Variable	**Mean**	**Median**	**STDEV**	**Count**
Dividend Payout Ratio (DPR)	0.313	0.256	0.404	3452
Systematic Risk (SYS)	0.027	0.025	0.034	3452
Unsystematic Risk (UNSYS)	0.066	0.052	0.048	3452
Profitability (NOPATTA)	0.063	0.069	0.074	3452
Cash Flow(FCFTA)	0.185	0.087	0.765	3452
Cash Flow per Share (CFPS)	1.050	0.321	3.223	3452
Earned Capital/Equity (REE)	0.112	0.115	0.203	3452
Liquidity (CASHTA)	0.092	0.044	0.321	3452
Liquidity(CR)	1.630	1.440	1.007	3452
Leverage (LTDTA)	0.054	0.000	0.081	3452
Leverage (DE)	0.436	0.319	0.503	3452
Firm Growth (MB)	2.240	1.345	4.164	3452
Firm Growth (g TA)	0.257	0.072	1.430	3452
Corporate Tax (TAX)	0.258	0.290	0.148	3452
Institutional Ownership (ISOWN)	0.055	0.000	0.109	3452
Insider Ownership (INSIDE)	0.021	0.000	0.064	3452
Firm Size (Log TA)	5.268	5.103	0.955	3452
Systematic Risk * Profitability (SYS*NOPATTA)	0.008	0.000	0.046	3452

	Other Industries			
Variable	**Mean**	**Median**	**STDEV**	**Count**
Systematic Risk * Cash flow (SYS*FCF)	0.003	0.000	0.028	3452
Systematic Risk * Cash flow (SYS*CFPS)	0.002	0.001	0.004	3452
Systematic Risk * Liquidity (SYS*CASHTA)	0.004	0.001	0.030	3452
Systematic Risk * Liquidity (SYS*CR)	0.030	0.006	0.165	3452
Systematic Risk * Firm growth (SYS*GTA)	0.002	0.001	0.008	3452
Systematic Risk * Firm growth (SYS*MB)	0.046	0.031	0.078	3452
Systematic Risk * Leverage (SYS*LTDTA)	0.012	0.001	0.066	3452
Systematic Risk * Leverage (SYS*DE)	0.067	0.029	0.253	3452
Systematic Risk * Earned capital (SYS*REE)	0.003	0.002	0.010	3452
Systematic Risk * Corporate taxation (SYS*Tax)	0.007	0.005	0.011	3452
Systematic Risk * Firm size (SYS*LOGTA)	0.150	0.126	0.189	3452
Systematic Risk * Institutional ownership (SYS*ISOWN)	0.002	0.000	0.005	3452
Systematic Risk * Insider ownership (SYS*INSIDE)	0.001	0.000	0.003	3452
Unsystematic Risk * Profitability (UNSYS*NOPATTA)	0.003	0.003	0.009	3452
Unsystematic Risk * Cash flow (UNSYS*FCF)	0.011	0.004	0.054	3452
Unsystematic Risk * Cash flow (UNSYS*CFPS)	0.050	0.014	0.176	3452
Unsystematic Risk * Liquidity (UNSYS*CASHTA)	0.007	0.002	0.028	3452
Unsystematic Risk * Liquidity (UNSYS*CR)	0.112	0.075	0.128	3452
Unsystematic Risk * Firm growth (UNSYS*GTA)	0.011	0.003	0.108	3452
Unsystematic Risk * Firm growth (UNSYS*MB)	0.150	0.066	0.537	3452
Unsystematic Risk * Leverage (UNSYS*LTDTA)	0.015	0.012	0.016	3452
Unsystematic Risk * Leverage (UNSYS*DE)	0.331	0.269	0.234	3452
Unsystematic Risk * Earned capital (UNSYS*REE)	0.005	0.005	0.022	3452
Unsystematic Risk * Corporate taxation (UNSYS*Tax)	0.004	0	0.009	3452

	Other Industries			
Variable	**Mean**	**Median**	**STDEV**	**Count**
Unsystematic Risk * Firm size (UNSYS*LOGTA)	0.002	0	0.007	3452
Unsystematic Risk * Instit. ownership (UNSYS*ISOWN)	0.003	0	0.137	3452
Unsystematic Risk * Insider ownership (UNSYS*INSIDE)	0.002	0.000	0.007	3452
2001	0.035	0.000	0.185	3452
Crisis	0.046	0.000	0.209	3452
Crisis*Systematic Risk (Crisis*SYS)	0.002	0.000	0.015	3452
Crisis*Unsystematic Risk (Crisis*UNSYS)	0.004	0.000	0.023	3452
Crisis*Cash flow (Crisis*FCF)	0.076	0.000	0.424	3452
Crisis*Leverage (Crisis*LTDTA)	0.011	0.000	0.413	3452
Crisis*Firm Growth (Crisis*GTA)	0.004	0.000	0.027	3452
Crisis*Institutional Ownership (Crisis*ISOWN)	0.008	0.000	0.046	3452
Crisis*Firm size (Crisis*log TA)	0.243	0.000	1.129	3452

DPR is the dividend payout ratio. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (CASHTA) is measured as the ratio of cash to total assets. Liquidity (CR) is measured by the current ratio. Firm Growth (g TA) is the growth of total assets. Firm Growth (MB) is the market-to-book ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Leverage (LTDTA) is the ratio of long-term debt to total assets. Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CFPS, CASHTA, CR, gTA, MB, REE, LTDTA, DE, TAX, ISOWN, INSIDE and log TA).2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, ISOWN and log TA).

Table 5-15: Summary Statistics, UK De-listed Sample

This table presents the summary statistics for the dividend payout ratio, the dividend yield and dividend policy determinants for 769 UK de-listed companies in the period 1991-2014.

	De-listed Sample		
Variable	**Mean**	**STDEV**	**Count**
Dividend Payout Ratio (DPR)	0.424	2.324	3845
Systematic Risk (SYS)	0.030	0.045	3845
Unsystematic Risk (UNSYS)	0.095	0.070	3845
Profitability (NOPATTA)	-0.018	0.334	3845
Cash Flow (FCFTA)	0.030	0.332	3845
Cash Flow (CFPS)	2.829	27.795	3845
Leverage (LTDTA)	0.027	0.074	3845
Earned Capital to Equity (REE)	-0.138	1.436	3845
Firm Growth (g TA)	0.204	0.857	3845
Firm Growth (MB)	3.357	12.401	3845
Current Ratio (CR)	1.803	2.111	3845
Corporate Taxation (TAX)	0.217	0.446	3845
Firm Size (Log TA)	5.031	1.000	3845
Institutional Ownership (ISOWN)	0.080	0.135	3845
Insider Ownership (INSIDE)	0.044	0.099	3845
Leverage (DE)	0.901	3.928	3845
Acquisition (ACQ)	0.466	0.499	3845
Liquidation (LIQ)	0.030	0.170	3845
Scheme of Arrangement (ARRANG)	0.016	0.124	3845
No Longer Meeting Listing Requirements (NMLR)	0.242	0.428	3845
Company Request (COREQ)	0.053	0.224	3845
In Administration (ADMIN)	0.072	0.259	3845
RECEIV (In Receivership)	0.011	0.106	3845
Low Trading Volume (LTV)	0.020	0.138	3845
Private Company (PRIV)	0.034	0.180	3845
MERGER (MERGE)	0.021	0.144	3845
Exchange Into (EXCHANGE)	0.037	0.188	3845

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage is the ratio of long-term debt to total assets (LTDTA). Corporate Tax (TAX) is the effective corporate tax rate. Institutional

Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic Risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Acquisition (ACQ) is a dummy variable that takes the value 1 for companies de-listed due to acquisition and 0 otherwise. In Administration (ADMIN) is a dummy variable that takes the value 1 for companies de-listed due to being in administration and 0 otherwise. Scheme of Arrangement (ARRANGE) is a dummy variable that takes the value 1 for companies de-listed due to a scheme of arrangement and 0 otherwise. Company Request (COREQ) is a dummy variable that takes the value 1 for companies de-listed due to company request and 0 otherwise. Liquidation (LIQ) is a dummy variable that takes the value 1 for companies de-listed due to liquidation or bankruptcy and 0 otherwise. In Receivership (RECEIV) is a dummy variable that takes the value 1 for companies de-listed due to being in receivership and 0 otherwise. Exchanged Into (EXCHANGE) is a dummy variable that takes the value 1 for companies de-listed due to being exchanged into another name and 0 otherwise. No Longer Meeting Listing Requirements (NMLR) is a dummy variable that takes the value 1 for companies de-listed due to their inability to meet the listing requirements and 0 otherwise. Merger (MERGE) is a dummy variable that takes the value 1 for companies de-listed due to being merged with another entity and 0 otherwise. Private Company (PRIV) is a dummy variable that takes the value 1 for companies de-listed due to being privatized and 0 otherwise.

The results presented in the above tables indicate that large-sized firms have higher dividend payout ratios than small-sized firms (mean DPR (above-average market capitalization) = 0.332; mean DPR (below-average market capitalization) = 0.291). Utilities have the highest payout ratio of all the sectors (mean DPR= 0.334), followed by service-sector companies (mean DPR = 0.329) and the lowest payout ratio is reported for firms that belong to the technology sector (mean DPR = 0.214).

Concerning systematic risk, firms with large dividend payout ratios have lower systematic risk (mean SYS (above-average DPR) = 0.031) than firms with low dividend payout ratios (mean SYS (below-average DPR) = 0.035). Large-sized companies have higher systematic risk (mean SYS (above-average market capitalization) = 0.034) than small-sized companies (mean SYS (below-average market capitalization) = 0.025). Meanwhile, systematic risk is the highest among technology companies (mean SYS = 0.038), followed by industrial firms (mean SYS = 0.030), while the lowest systematic risk is reported for firms that belong to the utilities sector (mean SYS = 0.017).

The results show that companies with low dividend payout ratios have higher levels of unsystematic risk (mean UNSYS (below-average DPR) = 0.078) when compared to firms with high dividend payout ratios (mean UNSYS (above-average DPR) = 0.058). Similarly, small-sized firms have higher unsystematic risk (mean UNSYS (below-average market capitalization) = 0.080) than large-sized firms (mean UNSYS (above-average market capitalization) = 0.060). When classified by sector, the highest unsystematic risk is reported for firms that belong to the technology sector (mean UNSYS = 0.086), followed by service sector companies (mean UNSYS = 0.074), and the lowest unsystematic risk is for utility companies (mean UNSYS = 0.051).

It appears that firms with high dividend payout ratios are more profitable (mean NOPATTA (above-average DPR) = 0.075) than firms with low dividend payout ratios (mean NOPATTA (below-average DPR) = 0.054). Likewise, large-sized firms are more profitable than small-sized firms (mean NOPATTA= 0.069 (above-average market capitalization); 0.061 (below-average)). According to the sector classification, utilities have the highest profitability (mean NOPATTA= 0.085), followed by industrial firms (mean NOPATTA= 0.065), while the lowest profitability is reported for technology firms (mean NOPATTA= 0.054).

The results also show that companies with high dividend payout ratios have higher cash flow levels (mean FCFTA= 0.220; mean CFPS= 0.489 (above-average DPR)) when compared to firms with low payout ratios (mean FCFTA= 0.138; mean CFPS= 0.346 (below-average DPR)). Large-sized firms (above-average market capitalization) generate higher levels of cash flow (mean FCFTA= 0.238; mean CFPS= 1.057) than small sized firms (below-average market capitalization: mean FCFTA = 0.104; mean CFPS= 0.536). Meanwhile, industrial firms and firms that belong to other industries have the highest levels of free cash flow (mean FCFTA (industrial) = 0.185; mean FCFTA (other) = 0.185), while the lowest level of free cash flow is reported for technology firms (mean FCFTA= 0.116). The other measure of cash flow, cash flow per share, is highest for firms that belong to the utilities sector (mean CFPS= 2.716), followed by other industries (mean CFPS= 1.050), while the least cash flow per share is reported for technology firms (mean CFPS= 0.488).

Concerning earned capital, companies with low dividend payout ratios have higher levels of retained earnings (mean REE (below-average DPR) =0.121) than high dividend payout ratio firms (mean REE (above-average DPR) =0.099). Large-sized companies have higher levels of retained earnings (mean REE (above-average market capitalization) = 0.131) than small-sized firms (mean REE (below-average market capitalization) =0.106). The highest earned capital is reported for the utility sector (mean REE = 0.142), followed by industrial firms (mean REE = 0.130), whereas the lowest earned capital is for technology firms (mean REE = 0.095).

The tables above further show that the liquidity of firms with low dividend payout ratios (below-average DPR; mean CASHTA = 0.109; mean CR = 1.685) is higher than that of firms with high dividend payouts (above-average DPR: mean CASHTA = 0.095; mean CR = 1.427). Large-sized firms (above-average market capitalization) have lower liquidity as measured by the ratio of cash to total assets (mean CASHTA = 0.097) than small-sized firms (mean CASHTA (below-average market capitalization) = 0.107). On the other hand, the current ratio of large-sized firms (mean CR = 1.619) is on average higher than that of small-sized firms (mean CR = 1.532). According to the sector classification, technology firms have the highest liquidity as measured by cash to total assets (mean CASHTA = 0.167). Firms that belong to other industries have the highest liquidity as measured by the current ratio (mean CR = 1.630), followed by industrial firms (mean CR =1.588). The lowest level of liquidity is reported for utilities according to both measures (mean CR = 1.142; mean CASHTA = 0.033)

The results also show that firms with high dividend payout ratios (above-average DPR) have higher debt levels (mean LTDTA = 0.062; mean DE = 0.470) than firms with lower dividend payouts (below-average DPR: mean LTDTA = 0.042; mean DE = 0.424). Similarly, large-sized firms have higher leverage as measured by long-term debt to total assets (mean LTDTA = 0.079) than small-sized firms (mean LTDTA = 0.017). Conversely, when leverage is measured by total debt to total equity, small-sized firms appear to have higher financial leverage (mean DE (below-average market capitalization) = 0.476; mean DE (above-average market capitalization) = 0.427). Firms that belong to other industries have the highest level of leverage (mean LTDTA = 0.054), followed by industrial firms (mean LTDTA = 0.050), while the lowest leverage is reported for technology firms (mean LTDTA = 0.028). Utilities have the highest debt-to-equity ratio (mean DE = 0.852) and technology firms the lowest (mean DE = 0.305).

Looking at firm growth, firms with high dividend payout ratios have low firm growth (mean g TA (above-average DPR) = 0.134); (mean MB (above-average DPR= 2.61), as compared to firms with low dividend payouts (mean g TA (below-average DPR) = 0.241); (mean MB (below-average DPR) = 2.834). Large-sized firms (above-average market capitalization) appear to have larger firm growth (mean g TA = 0.351; mean g MB = 3.180) than small-sized (below-average market capitalization) firms (mean g TA =0.086; mean MB = 2.379).According to the sector classification, companies that belong to the technology sector have the highest market-to-book ratio (mean MB = 3.999), followed by service sector firms (mean MB = 2.883), while utilities appear to have the lowest (mean MB = 1.692). Meanwhile, firms that belong to other industries have the highest growth of total assets (mean g TA = 0.257), followed by technology firms (mean g TA = 0.205), with the lowest growth of total assets reported for utilities (mean g TA = 0.155).

The results also show that firms with high (above-average) dividend payout ratios have higher corporate tax rates (mean TAX = 0.288) than firms with low (below-average) dividend payout ratios (mean TAX = 0.223). The corporate tax rate is higher for large-sized (above-average market capitalization) firms (mean TAX = 0.256) than small-sized (below-average) (mean TAX = 0.247). By sector, industrial firms and those in other industries exhibit the highest corporate tax rates (mean TAX: industrial = 0.258; other industries = 0.258), while the lowest tax rate is reported for utilities (mean TAX = 0.225).

The results indicate that companies with high (above-average) dividend payouts are larger (mean log TA = 5.379) than firms with low (below-average) dividend payouts (mean log TA = 4.99). Firms with above-average market capitalization are larger based on log of total assets (mean log TA = 5.585) than those with below-average market capitalization (mean log TA = 4.718). The largest firm size is reported for utility firms (mean log TA = 6.295), followed by firms that belong to other industries (mean log TA = 5.268), while technology firms have the lowest total assets (mean log TA = 4.852) among all the sectors.

It appears that the percentage of institutional ownership is lower for firms with above-average dividend payout ratios (mean ISOWN = 0.063) than firms with below-average payout ratios (mean ISOWN = 0.066). Large-sized firms have higher levels of institutional ownership (mean ISOWN (above-average market capitalization) = 0.0094) than small-sized firms (mean

ISOWN (below-average market capitalization) = 0.033). When classified by sector, institutional ownership is the highest among the technology sector (mean ISOWN = 0.088), followed by industrial firms (mean ISOWN = 0.064), while the lowest values are reported for utilities firms (mean ISOWN = 0.42). On the contrary, the percentage of Insider and managerial ownership is higher for firms with low dividend payout ratios (mean INSIDE (below-average DPR) = 0.032) than firms with higher payouts (mean INSIDE (above-average DPR) = 0.018). Large-sized firms have higher Insider ownership than small-sized (mean INSIDE (above-average market capitalization) = 0.034; mean INSIDE (below-average market capitalization) = 0.018). The highest percentage of Insider ownership is reported for technology firms (mean INSIDE = 0.050), followed by industrial firms (mean INSIDE = 0.026), while the lowest is for utilities (mean INSIDE = 0.01).

The interaction variables for systematic and unsystematic risks and the crisis indicate that systematic risk was equivalent during the crisis for companies with high and low dividend payout ratios. Unsystematic risk was higher for companies with below-average dividend payouts (mean Crisis*UNSYS = 0.006) than above-average (mean Crisis*UNSYS = 0.003). Both systematic and unsystematic risks were higher for large-sized firms (above-average market capitalization: mean Crisis*SYS = 0.004; mean Crisis*UNSYS = 0.006) than small-sized firms (below-average market capitalization: mean Crisis*SYS= 0.001; mean Crisis*UNSYS= 0.001). According to the sector classification, systematic and unsystematic risk were highest during the crisis period for technology firms (mean Crisis*SYS = 0.004; mean Crisis*UNSYS = 0.007), while utilities are reported to have had the lowest systematic and unsystematic risk during the crisis (mean Crisis*SYS = 0.001; mean Crisis*UNSYS = 0.001).

Conclusion

It appears from the above results that firms with high dividend payout ratios, as compared to firms with lower dividend payouts, have lower levels of systematic and unsystematic risk, higher profitability, higher cash flow levels and are of a larger size. This justifies their having higher dividend payouts. Meanwhile, utilities have the lowest levels of systematic and unsystematic risk, the highest profitability and report the highest payout ratios of all industrial sectors.

The levels of earned capital are higher among firms with low dividend payout ratios, large-sized companies and companies that belong to the utilities sector. The higher dividend payout ratios associated with these groups provide mixed insights into the adherence of firms to the life cycle theory of dividends. Firms with lower payout ratios and large-sized firms have larger firm growth than higher dividend payout ratio and small-sized firms. This could indicate that investment opportunities could cause the dividend payout ratios of firms to move in different directions.

The high levels of financial leverage reported for companies with high payout ratios, large-sized companies and companies that belong to the utilities sector could indicate that high levels of debt are not associated with lower payout ratios. This evidence is also supported by the fact that firms that belong to the technology sector have the lowest levels of leverage yet still report the lowest dividend payout ratios.

Firms that pay higher dividends, large-sized firms and utilities firms have low liquidity despite their high payout levels. This could indicate that high levels of liquidity are not necessarily associated with higher dividend payout ratios for UK firms.

The results also show that firms with high payouts and utility firms have low levels of institutional and Insider ownership. On the contrary, technology firms have the highest institutional and insider ownership and report the lowest dividend payout ratios of all the sectors. This suggests that high percentages of institutional and insider/management ownership could be associated with low dividend payments and vice versa. Furthermore, the fact that the highest corporate tax rates are reported for firms with large payout ratios could point to the possibility that firms pay high levels of dividends even when subject to high corporate tax rates.

5.3 Empirical Results and Discussion

This section displays the results of the GMM regression analysis conducted on a sample of UK firms. In studying the determinants of the dividend payout ratio, a GMM-in-system estimation model equation was formulated as follows:

$$y_{it} - y_{i,t\text{-}1} = \alpha_i + ß_1 x_{1it} - x_{1it\text{-}1} + ... + ß_k x_{kit} - x_{kit\text{-}1} + Time_t - Time_{t\text{-}1} + v_{it} - v_{it\text{-}1}$$

The researcher used lagged differences of the series as instruments for the equations in levels (x_{it-1} -x $_{it-2}$), in addition to lagged levels of the series dated (t-2), (t-3) and (t-4) as instruments for the equations in first differences, under the assumption that these differences are uncorrelated with the firm-specific effect, η_{it}, even though the levels of the series are correlated with η_{it}.

Section 5.3.1 reports the results for Model (1) that covers the determinants of the dividend payout ratio and the interaction variables for systematic and unsystematic risks. Section 5.3.2 reports the results for Model (2) that provides insights into the determinants of the dividend payout ratio and the interaction variables for the crisis period. The results in both sections are first presented for the entire sample of UK non-financial companies. Second, firms are grouped according to level of dividend payout ratio (Arnott & Asness, 2003). Third, firms are sorted into two groups based on their market capitalization (Fatemi & Bildik, 2012). Finally, the firms are divided into five groups based on industrial sector (Rubin & Smith, 2009; Gill et al., 2010). Section 5.3.3 reports the results for the impact of reason for de-listing on firms' dividend payout ratios.

The Sargan test of over-identified restrictions that tests the validity of instruments used under GMM estimation was carried out. This test is based on a heteroscedasticity-consistent two-step GMM estimator that tests for the validity of the extra instruments in the equation. The statistics are asymptotically distributed as a chi-square with as many degrees of freedom as there are over-identifying restrictions under the null hypothesis of valid instruments. To find out whether the results were statistically significant or not, the Sargan p-value was calculated and it is reported to be in the range of 0.2 to 0.3 for all models and all groupings.

This proves that the overall validity of the instruments and the overall specification of the model cannot be rejected.

5.3.1. Model (1) GMM Results – Determinants of Dividend Payout Ratio and Firm Risk Interaction Variables

Table 5-16: Model (1), Determinants of Dividend Payout Ratio, UK Non-financial Firms, Entire Sample, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. *significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Coefficients
Constant	-0.001
Profitability (NOPATTA)	0.539 (36.524) ***
Cash Flow(FCFTA)	0.096 (12.209) ***
Liquidity(CASHTA)	-0.005 (-0.611)
Earned Capital/Equity(REE)	-0.699 (-45.231) ***
Leverage (LTDTA)	0.041 (3.670) ***
Firm Growth (gTA)	2.730 (1.210)
Corporate Tax (TAX)	0.304 (31.090) ***
Institutional Ownership (ISOWN)	-0.023 (-2.041) **
Insider Ownership (INSIDE)	-0.071 (-5.418) ***
Firm Size (log TA)	0.151 (15.735) ***
Systematic Risk (SYS)	-0.034 (-3.843) ***
Unsystematic Risk (UNSYS)	-0.113 (-11.527) ***

Variable	Coefficients
Systematic Risk* Profitability (SYS*NOPATTA)	-0.055 (-3.513) ***
Systematic Risk* Cash Flow (SYS*FCFTA)	0.012 (1.339)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.026 (-3.154) ***
Systematic Risk* Firm Growth (SYS*g TA)	-0.011 (-1.195)
Systematic Risk* Earned Capital (SYS*REE)	0.084 (4.871) ***
Systematic Risk* Leverage (SYS*LTDTA)	0.022 (1.932)*
Systematic Risk* Firm Size (SYS*log TA)	-0.014 (-1.406)
Systematic Risk* Corporate Taxation (SYS*TAX)	0.0001 (0.084)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.023 (-1.893)*
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.037 (-2.542)**
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	-0.032 (-1.839)*
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.003 (0.379)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.027 (-2.965) ***
Unsystematic Risk* Firm Growth (UNSYS*g TA)	-0.007 (-0.813)
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.171 (9.242) ***
Unsystematic Risk* Leverage (UNSYS*LTDTA)	0.003 (0.306)
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.013 (-1.433)
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.021 (1.882) *
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.017 (-1.358)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.036 (-2.386) **
$\bar{R}^2$	36.96%
N	12,292
J-STATISTIC	38.09
SARGAN P-VALUE	0.2488

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is also used in the regression.

Table 5- 17: Model (1), Determinants of the Dividend Payout Ratio, UK Firms Grouped by Dividend Payout Ratio, Risk Interaction Variables

This table presents the GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. *significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Above Average DPR	Below Average DPR
Constant	-0.002	0.0004
Profitability (NOPATTA)	0.075 (1.939) *	0.111 (1.443)
Cash Flow(FCFTA)	0.041 (3.699) ***	0.025 (3.221) ***
Liquidity(CASHTA)	0.169 (1.647) *	-0.161 (-1.016)
Earned Capital/Equity(REE)	-0.578 (-8.864) ***	-0.429 (-4.032) ***
Leverage (LTDTA)	0.044 (0.754)	0.146 (2.630) ***
Firm Growth (gTA)	0.027 (0.576)	-0.01 (-0.221)
Corporate Tax (TAX)	0.045 (2.388) **	0.151 (11.157) ***
Institutional Ownership (ISOWN)	0.024 (0.409)	-0.059 (-1.237)
Insider Ownership (INSIDE)	-0.004 (-0.093)	-0.098 (-2.611) ***
Firm Size (log TA)	0.075 (1.877) *	0.078 (1.298)
Systematic Risk (SYS)	-0.078 (-3.413)***	-0.072 (-2.955) ***
Unsystematic Risk (UNSYS)	-0.229 (-4.441) ***	-0.293 (-4.247) ***
Systematic Risk* Profitability (SYS*NOPATTA)	0.032 (2.129) **	-0.168 (-2.433) **
Systematic Risk* Cash Flow (SYS*FCFTA)	0.032 (2.748) ***	-0.0003 (-0.038)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.029 (-1.181)	0.025 (0.917)
Systematic Risk* Firm Growth (SYS*g TA)	-0.010 (-0.542)	0.022 (1.362)
Systematic Risk* Earned Capital (SYS*REE)	-0.058 (-2.538) **	0.246 (3.571) ***

Variable	Above Average DPR	Below Average DPR
Systematic Risk* Leverage (SYS*LTDTA)	0.028 (1.418)	-0.0002 (-0.015)
Systematic Risk* Firm Size (SYS*log TA)	0.001 (0.087)	-0.043 (-3.585) ***
Systematic Risk* Corporate Tax (SYS*TAX)	0.017 (1.399)	-0.034 (-3.810) ***
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.024 (-1.175)	-0.014 (-0.881)
Systematic Risk*Insider Ownership(SYS*INSIDE)	-0.046 (-1.905) *	0.002 (1.295)
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.042 (2.405) **	0.299 (3.306) ***
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.002 (0.138)	-0.023 (-2.492) **
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.171 (-1.645)	0.171 (1.038)
Unsystematic Risk* Firm Growth (UNSYS*g TA)	-0.004 (-0.091)	-0.008 (-0.155)
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.294 (-5.854) ***	0.056 (0.497)
Unsystematic Risk* Leverage (UNSYS*LTDTA)	-0.040 (-0.738)	-0.072 (-1.422)
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.001 (-0.048)	-0.034 (-3.043) ***
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	-0.006 (-0.440)	-0.048 (-3.838) ***
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.049 (-0.830)	-0.039 (-0.710)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.032 (-1.251)	-0.015 (-0.843)
$\overline{R}^2$	59.93%	10.97%
N	3333	6650
J-STATISTIC	35.393	33.962
SARGAN P-VALUE	0.2685	0.2407

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, gTA, REE, LTDTA, logTA, TAX, ISOWN and INSIDE). A dummy variable for Time is also used in the regression.

Table 5-18: Model (1), Determinants of the Dividend Payout Ratio, UK Firms Grouped by Firm Size, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Above Average MC	Below Average MC
Constant	-0.005	-0.001
Profitability (NOPATTA)	0.173 (2.798) ***	0.448 (14.325) ***
Cash Flow(FCFTA)	0.002 (0.065)	0.043 (4.491) ***
Liquidity(CASHTA)	-0.014 (-0.183)	0.003 (0.173)
Earned Capital/Equity(REE)	-0.359 (-4.929) ***	-0.649 (-19.482) ***
Leverage (LTDTA)	0.174 (4.638) ***	0.045 (1.197)
Firm Growth (gTA)	-0.022 (-0.907)	0.061 (5.906) ***
Corporate Tax (TAX)	0.185 (11.360) ***	0.241 (14.986) ***
Institutional Ownership (ISOWN)	0.015 (0.378)	-0.057 (-2.229) **
Insider Ownership (INSIDE)	0.028 (1.260)	-0.029 (-0.961)
Firm Size (log TA)	0.193 (5.947) ***	0.176 (6.058) ***
Systematic Risk (SYS)	-0.038 (-1.815) *	-0.001 (-0.052)
Unsystematic Risk (UNSYS)	-0.239 (-4.909) ***	-0.038 (-2.219) **
Systematic Risk* Profitability (SYS*NOPATTA)	0.146 (3.649) ***	0.026 (1.339)
Systematic Risk* Cash Flow (SYS*FCFTA)	0.003 (0.208)	-0.014 (-1.192)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.036 (-1.768) *	-0.001 (-0.107)
Systematic Risk* Firm Growth (SYS*g TA)	0.020 (1.649) *	0.008 (0.931)
Systematic Risk* Earned Capital (SYS*REE)	-0.083 (-2.052) **	0.029 (1.377)

Variable	Above Average MC	Below Average MC
Systematic Risk* Leverage (SYS*LTDTA)	-0.007 (-0.488)	0.005 (0.305)
Systematic Risk* Firm Size (SYS*log TA)	-0.021 (-1.799) *	0.016 (1.386)
Systematic Risk* Corporate Tax (SYS*TAX)	0.014 (1.311)	-0.010 (-0.799)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	0.001 (0.039)	0.013 (0.682)
Systematic Risk*Insider Ownership (SYS*INSIDE)	0.002 (0.147)	-0.059 (-2.828) ***
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.557 (7.675) ***	0.071 (3.663) ***
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.020 (0.675)	-0.015 (-1.447)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.017 (-0.198)	0.006 (0.533)
Unsystematic Risk* Firm Growth (UNSYS*g TA)	0.008 (0.376)	-0.004 (-0.418)
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.261 (-3.358) ***	0.025 (1.250)
Unsystematic Risk* Leverage (UNSYS*LTDTA)	-0.137 (-4.142) ***	-0.003 (-0.194)
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.005 (-0.336)	0.031 (2.519) **
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	-0.002 (-0.146)	-0.017 (-1.298)
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	0.013 (0.322)	-0.015 (-0.973)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.009 (-0.503)	-0.027 (-1.075)
$\overline{R}^2$	36.56%	22.91%
N	5516	6179
J-STATISTIC	35.74	35.578
SARGAN P-VALUE	0.2167	0.2615

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, gTA, REE, LTDTA, logTA, TAX, ISOWN and INSIDE). A dummy variable for Time is also used in the regression.

Table 5-19: Model (1), Determinants of the Dividend Payout Ratio, Firms Grouped by Sector, Risk Interaction Variables.

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014, classified by sector. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Industrial	Technology	Service	Utility	Other Industries
Constant	0.001	0.001	-0.008	-0.022	-0.0002
Profitability (NOPATTA)	0.409 (16.837) ***	0.510 (10.803) ***	0.579 (12.999) ***	0.090 (1.234)	0.695 (22.331) ***
Cash Flow(FCFTA)	0.089 (6.501) ***	0.063 (2.772) ***	0.037 (1.528)	-0.021 (-0.283)	0.089 (5.081) ***
Liquidity(CASHTA)	-0.037 (-2.653) ***	-0.059 (-2.390) **	-0.150 (-6.607) ***	-0.174 (-4.718) ***	-0.003 (-0.221)
Earned Capital/Equity (REE)	-0.590 (-23.260) ***	-0.451 (-9.148) ***	-0.686 (-15.152) ***	-0.397 (-5.951) ***	-0.867 (-23.492) ***
Leverage (LTDTA)	0.022 (1.139)	0.008 (0.248)	-0.024 (-0.815)	0.278 (3.069) ***	0.029 (1.378)
Firm Growth (g TA)	-0.067 (-4.896) ***	-0.096 (-4.544) ***	0.006 (0.254)	0.172 (2.691) ***	-0.006 (-0.382)
Corporate Tax (TAX)	0.274 (17.888) ***	0.264 (9.189) ***	0.429 (16.642) ***	0.148 (2.378) **	0.292 (16.382) ***
Firm Size (log TA)	0.153 (7.660) ***	0.041 (1.264)	-0.021 (-0.675)	0.253 (3.298) ***	0.147 (6.523) ***

Variable	Industrial	Technology	Service	Utility	Other Industries
Institutional Ownership (ISOWN)	-0.037 (-1.824) *	-0.023 (-0.789)	-0.145 (-3.083) ***	0.471 (4.459) ***	-0.064 (-2.531) **
Insider Ownership (INSIDE)	-0.047 (-2.112) **	-0.087 (-2.823) ***	-0.158 (-3.106)***	-10.389 (-2.630) ***	-0.106 (-4.014) ***
Systematic Risk (SYS)	-0.099 (-5.668)***	-0.001 (-0.038)	-0.038 (-1.022)	-1.212 (-2.597) **	-0.045 (-2.043) **
Unsystematic Risk (UNSYS)	-0.138 (-7.203) ***	-0.200 (-3.090)***	-0.083 (-2.027) **	-13.909 (-2.426) **	-0.122 (-5.209) ***
Systematic Risk* Profitability (SYS*NOPATTA)	-0.018 (-0.784)	-0.183 (-3.810) ***	-0.044 (-1.271)	-0.041 (-0.471)	-0.014 (-0.529)
Systematic Risk* Cash Flow (SYS*FCFTA)	0.008 (0.549)	0.069 (2.549)**	0.006 (0.199)	-0.076 (-0.984)	0.019 (1.039)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.026 (-1.804) *	-0.003 (-0.143)	0.027 (1.257)	-0.070 (-1.428)	-0.011 (-0.614)
Systematic Risk* Firm Growth (SYS*g TA)	-0.021 (-1.457)	-0.043 (-1.878)*	-0.004 (-0.157)	-0.047 (-0.902)	-0.006 (-0.362)
Systematic Risk* Earned Capital (SYS*REE)	0.079 (3.152) ***	0.164 (3.287) ***	0.031 (0.807)	0.374 (5.074) ***	0.048 (1.585)
Systematic Risk* Leverage (SYS*LTDTA)	0.031 (1.627)	0.058 (1.923) ***	-0.023 (-0.655)	0.182 (2.809) ***	0.045 (2.118) **
Systematic Risk* Firm Size (SYS*log TA)	0.010 (0.631)	-0.043 (-1.617)	0.030 (1.362)	-0.077 (-1.253)	-0.024 (-1.233)
Systematic Risk* Corporate Tax (SYS*TAX)	0.032 (1.909) *	0.027 (1.113)	-0.022 (-0.866)	-0.018 (-0.231)	0.009 (0.475)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.031 (-1.928) *	0.031 (0.962)	0.015 (0.427)	-0.122 (-1.328)	-0.037 (-1.921)*
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.003 (-0.135)	-0.078 (-2.308) **	-0.055 (-1.612)	-127.07 (-2.564) ***	-0.036 (-1.0809)*

Variable	Industrial	Technology	Service	Utility	Other Industries
Unsystematic Risk* Profitability (UNSYS*NOPATTA	0.013 (0.586)	-0.111 (-2.387) **	0.115 (3.315) ***	0.072 (0.877)	0.045 (1.592)
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.012 (0.788)	0.012 (0.489)	-0.069 (-2.317)**	-0.055 (-0.576)	0.021 (1.111)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.027 (-1.884) *	-0.017 (-0.663)	-0.006 (-0.292)	-0.032 (-0.801)	0.009 (0.519)
Unsystematic Risk* Firm Growth (UNSYS*g TA)	0.029 (2.039) **	-0.016 (-0.727)	-0.032 (-1.227)	0.178 (2.476) **	0.021 (1.209)
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.144 (6.287) ***	0.031 (0.572)	0.025 (0.654)	0.167 (2.563) **	0.057 (1.831)*
Unsystematic Risk* Leverage (UNSYS*LTDTA)	0.011 (0.612)	-0.036 (-1.313)	0.013 (0.401)	0.016 (0.262)	0.009 (0.538)
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.016 (-1.121)	-0.011 (-0.420)	0.056 (2.832) ***	0.003 (0.049)	0.035 (2.087) **
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.070 (4.236) ***	0.039 (1.588)	-0.004 (-0.157)	-0.076 (-1.089)	0.027 (1.436)
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.055 (-3.486) ***	0.051 (1.974) **	0.013 (0.355)	0.070 (0.754)	-0.067 (-3.347) ***
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	0.023 (1.015)	-0.001 (-0.016)	0.061 (1.542)	-13.916 (-2.423) **	-5.6E-05 (0.003)
$\overline{R}^2$	34.11%	25.67%	36.86%	37.75%	40.19%
N	4803	1396	1379	267	3391
J-STATISTIC	34.615	37.287	37.292	36.302	35.029
SARGAN P-VALUE	0.2993	0.2389	0.2022	0.2749	0.2827

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA).

Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

A. Determinants of Dividend Payout Ratio

Corporate Earnings and Cash Flow

The results reported in **Tables 5-15** to **5-18** show that profitability (NOPATTA) is positively and significantly associated with the dividend payout ratio for the entire sample of UK firms, for companies with high and low dividend payout ratios, for small and large-sized firms, and across all industrial sectors, except for utilities whose coefficient is insignificant.

The above results are consistent with survey evidence provided by Pruitt and Gitman (1991), Baker and Powell (2000), and Brav et al. (2005), who report that managers view current levels of earnings as one of the main determinants of dividend policy. The profound positive association between profitability and the dividend payout ratio proves that managers set their payout ratios based on their current level of earnings, lending strong support to prior empirical evidence (Aggarwal & Dow, 2012; Driver, 2015). The mean value of profitability is 7.5% for companies with high dividend payout ratios versus 5.4% for firms with low dividend payout ratios. This shows that profitability is higher among companies with high payouts, in line with prior research that shows an association between the concentration of earnings and the concentration of dividends (Fama & French, 2001; De Angelo et al., 2004). The results also conform to those of other studies that report a positive association between profitability and the propensity to pay dividends, including Denis and Osobov (2008), Renneboog and Trojanowski (2011) and Alzahrani and Lasfer (2012).

The positive and significant associations between the dividend payout ratio and both profitability and firm size show that larger, more profitable firms are more capable of paying higher dividends. This could stem from two facts: first, their stronger capability for avoiding the high costs associated with external debt financing, in light of the pecking order theory, similarly to what is shown in the findings of Bassidiq and Hussainey (2010); second, their ability to absorb the higher transaction costs associated with raising new equity, in line with Baker et al. (2013).

The role of dividends as a signalling tool offers an alternative insight into the positive relationship between profitability and the dividend payout ratio. According to this, managers increase their dividend payouts to convey their earnings potential and financial stability, in line with the predictions of the signalling theory (Ho, 2003; Consler et al., 2011).

The findings also show that cash flow, as measured by free cash flow to total assets (FCFTA), is a positive and strongly significant determinant of the dividend payout ratio for the entire sample of UK firms, for companies at all levels of dividend payout, for small-sized companies and for firms in all sectors except for utilities and services. When cash flow is measured by cash flow per share (CFPS), the above results are robust for companies across all levels of dividend payout ratio, for small-sized companies and for companies in all sectors except for technology **(see Appendix 5.1)**.This evidence appears in line with Atieh and Hussain (2009), who prove that UK firms with high levels of operating cash flow pay higher dividends since dividends are actually paid out of the cash flow available to firms. For low-dividend-paying companies, the positive relationship between free cash flow and the dividend policy could be explained as an attempt to use dividends as a means of signalling efficient performance. This appears reasonable since the mean value of free cash flow to total assets is 13.8% for this group, versus 22% for firms with large dividend payouts. Another explanation is that companies may expel excess cash flow in the form of dividends to minimize agency conflicts, especially in firms with more shareholders. The positive association between CFPS and the dividend payout ratio is also consistent with the findings of Consler et al. (2011), who report a positive relationship between cash flow per share and dividends per share. The consistently positive and significant association between dividends and free cash flow lends support to the free cash flow hypothesis, which states that firms will attempt to expel excess free cash flow in the form of dividends so as to reduce suboptimal investment that would result in the escalation of unsystematic risk, in line with Blau and Fuller (2008).

Liquidity

The results reported in **Tables 5-15** to **5-18** show that the coefficient for liquidity (CASHTA) is positive and significant for firms with high dividend payout ratios while it is negative for firms across all sectors apart from other industries. The coefficient, however, is negative yet insignificant for the entire sample of firms and for firms grouped by size. Conversely, using the current ratio (CR) as a proxy for liquidity yields varying results in terms of significance since the coefficient is negative and significant only for the entire sample of firms and for firms that belong to the industrial sector, the technology sector and other industries **(see Appendix 5.2**). Overall, the results show that firms with high levels of liquidity have lower dividend payout ratios, in accordance with Blau and Fuller (2008). Similarly, De Angelo et al. (2006) prove that firms with high levels of liquidity have a lower propensity to pay dividends. A plausible explanation is the tendency of firms to favour financial flexibility in setting their dividend payout policies. In this respect, firms lower their payout ratios at high levels of liquidity so as to be capable of responding to their investment opportunity set. The flexibility hypothesis and precautionary motives for holding cash appear reasonable in the case of technology firms. The negative association between firm growth and the payout ratio for this group of firms implies that they lower their dividend payouts to finance growth. In addition, technology firms have the highest level of unsystematic risk, which justifies their preservation of liquidity at the expense of their dividend payout ratios. Alternatively, low-cash-holding firms tend to pay high dividends since they consider them a pre-commitment device crucial in solving agency-related problems. The results also conform to prior evidence from the UK (Al-Najjar & Belghitar, 2009; Ma, 2012) of an inverse relationship between liquidity as measured by cash to total assets, and both the dividend yield and dividend to total assets respectively. This negative association between liquidity and the dividend payout ratio could also indicate that firms honour their dividend payouts at the expense of liquidity. Therefore, they can hold low levels of cash since they are capable of raising funds at lower transaction costs. The above results appear rational in the case of firms with high payout ratios. Those firms appear to have lower liquidity, as measured by cash to total assets and the current ratio, than firms with low payout ratios. On the other hand, companies with high dividend payout ratios appear to increase their payout ratios when their liquidity increases. The results, however, contradict earlier findings by Chay and Suh (2009), Goyal and Muckley (2013) and

Bliss et al. (2015), who all report a positive association between firm liquidity and the propensity for paying dividends. This proves that higher levels of liquidity do not dictate higher payout ratios for UK firms.

Leverage

The results reported in **Tables 5-15** to **5-18** show that leverage (LTDTA) is positively and significantly associated with the dividend payout ratio for the entire sample of firms, for companies with low dividend payout ratios, for large-sized firms and for utilities. The coefficient of total debt to equity (DE), an alternative proxy for leverage, shows a positive and significant relationship with the dividend payout ratio for the entire sample of firms, for companies that have high dividend payout ratios, for large-sized firms and across all sectors apart from technology and services **(see Appendix 5.3).**The results strongly support the notion that UK companies with high financial leverage have higher dividend payout ratios. This evidence conforms to survey results provided by Dhanani (2005) for the UK. It also highlights the shareholder aspect of dividend policy, in which managers of highly indebted companies attempt to compensate shareholders for the increased equity risk by paying higher dividends. This finding is also consistent with Al-Najjar and Belghitar (2011) and Khan (2006), who find a positive effect of leverage on the dividend policy, explaining it as leverage being an indicator for the firm’s ability to raise external capital. In this instance, a highly leveraged company does not need to hold cash and can pay large dividends and rely on debt to finance its investments. This explanation appears rational in the case of the utilities sector, as firms with strong growth and high leverage have high payout ratios, a finding that suggests the use of debt to finance investments.

The positive relationship between leverage and the dividend payout ratio is also consistent with earlier findings by Florackis et al. (2015). They attribute this relationship to high debt levels causing an increase in the level of monitoring by capital markets. Consequently, debt commits firms to disgorging cash flow in the form of dividends so as to constrain managers from using it to pursue personal goals. The positive relationship between leverage and the dividend payout ratio is in line with other studies, such as Sharon and Frank (2005) and Thanatawee (2011) for the US and Taiwan, respectively. They explain it in the context of firms relying on debt to finance their dividend payouts. However, under the Company Act (2006),UK companies are only authorized to pay dividends out of their earnings, any dividends paid out of debt being considered illegal.

The flexibility hypothesis presented and empirically proven by Blau and Fuller (2008) offers another explanation for the positive association between leverage and the dividend payout ratio. Under this hypothesis, firms with low debt levels pay low dividends so as to retain the cash necessary for investing in projects that the managers believe are value maximizing. In this case, refraining from making high dividend payments is likely to provide the firm with the required financial flexibility to undertake the investment it requires.

Conversely, the above results contrast with earlier studies by Benito and Young (2003), Farinha (2003) for the UK, Harada and Nguyen (2011) for Japan, and Bliss et al. (2015), who report an inverse relationship between dividend policy and leverage. They attribute this association to the fact that debt places restrictions on dividend payments due to interest expenses and debt covenants that limit the dividend-paying capacity of firms. However, it appears that, for the sample under study, high debt levels do not restrict UK companies from paying high dividends.

Corporate Taxation

The results reported in **Tables 5-15** to **5-18** show that the coefficient of corporate tax (TAX) is consistently positive and significant for the entire sample of firms, for firms at all levels of payout ratio, for large and small-sized firms, and for firms belonging to all sectors. This evidence appears to contradict the expected hypothesis but is in line with some previous studies (Nadeau & Strauss, 1993; Ince& Owers, 2012; Uwuigbe & Olusegun, 2013). This indicates that a rise in corporate tax rates could increase companies' reliance on debt financing as a means of increasing their tax shields. Consequently, companies can pay higher dividends and raise the required funds through borrowing, a reasonable explanation given the positive association between the dividend payout ratio and financial leverage. This supports the findings of the *Kay* (2012), which reported an increase in the cost of equity capital for companies, by historical standards and in absolute terms, caused by firms' increased reliance on debt financing.

Firm Size

The results reported in **Tables 5-15** to **5-18** show that the coefficient of firm size (log TA) is positive and significant for the entire sample of companies, for companies with high dividend payout ratios, for firms of all sizes, and for industrial, utility and other-industry firms. This finding is in accordance with results from other studies, such as Al-Najjar and Hussainey (2009) and Al-Najjar and Belghitar (2011), who identify firm size as an indicator for the cost of external borrowing. In this respect, large firms' low flotation costs compared to those of small-sized firms makes it economically feasible for them to hold less cash, pay higher dividends and raise the funds they require externally. This justification in the prior literature appears rational given the positive association between leverage and the payout ratio reported for the sample under study here.In addition, large-sized firms appear to face lower financial distress, allowing them to support higher dividend payouts and hold less cash.

The results also coincide with Thanatawee (2011), who proves that large-sized firms have higher dividend payout ratios, which he attributes to such firms being more mature, and having excess cash flows and limited growth opportunities, allowing them to support higher payouts. This explanation is questionable given my prior results that prove high-growth companies to have higher dividend payout ratios. Another possible justification for greater firm size being linked to higher dividend payout ratios relates to large-sized firms being characterized by lower managerial concentration. In this instance, dividends can act as a monitoring tool to help reduce agency conflict, in line with Hoberg and Prabhala (2009) and Rapp et al. (2014). Nevertheless, this explanation is doubtful for the sample under study since large-sized firms are reported to have a mean value of insider ownership equal to 3.4% as compared to 1.8% for small-sized ones.

The results are in contrast to those of Gul (1999) and Farinha (2003), who prove that firm size and the dividend policy are negatively associated and attribute this finding to large firms being highly leveraged such that debt constraints hinder their ability to pay dividends. This contradicts the previously mentioned positive association between leverage and the dividend payout ratio reported in this study.

Industry

The findings point to industry type having an impact on the dividend payout ratio of firms. The descriptive statistics indicate that technology firms pay the lowest dividends, with an average dividend payout ratio of 21.4%. Firm growth is the highest among the technology sector, with an average growth rate of total assets of 20.5%. This could explain why they pay lower dividends, since firms favour retaining their earnings for growth purposes. The results support the *Kay* (2012), who reports that large high-tech companies rely on internal financing and debt to finance their investments. The results could also imply a tendency among technology firms to pay low dividend payout ratios as a means of signalling they have an abundance of investment opportunities in line with Salih (2010).

Utilities, meanwhile, appear to have the highest payout ratios, with a mean of 33.4%. It appears that,due to regulation, utilities may have high payout ratios to force themselves to seek external capital as a means of monitoring and to substitute for insider agency control mechanisms. This result appears justifiable since utilities show the lowest percentage of ownership by institutional investors (a mean of 4.2%) yet they report a consistently negative association between the dividend payout ratio and institutional ownership. This finding is in line with earlier results by Smith (1986) and Moyer et al. (1992).

It is also evident that firm growth does not dictate the payout ratios of service sector firms. They appear to pay dividends to minimize agency-related problems, as shown by the consistently negative coefficients for institutional and insider ownership in respect of the payout ratio.

Systematic and Unsystematic Risk

The results reported in **Tables 5-15** to **5-18** show that the estimated coefficients of systematic and unsystematic risks are negative and statistically significant for the entire sample of UK companies, for companies with high and low payout ratios and for large-sized firms. Based on the sector classification, systematic risk is a significant determinant of the dividend payout ratio for industrial, utility and other industry firms. On the other hand, unsystematic risk is negatively and significantly associated with the dividend payout ratio for small-sized firms and for companies across all sectors.

The above results reflect the concept of managerial conservatism suggested by Lintner (1956) and Brav et al. (2005), which holds that managers tend to increase their dividends when they are confident their earnings can be maintained or increased. Similarly, high levels of profitability reduce firm risk and increase the dividend-paying capacity of firms. The results are in line with the positive and significant association between profitability and the dividend payout ratio reported across all groupings. The results are also in line with Schooley and Barney (1994) who find that high levels of profitability reduce risk and hence justify an increase in dividends. On the contrary, a decrease in earnings is associated with an increase in risk levels and a reduction in dividend payouts. Increased levels of risk are also likely to create cash flow shortages, thus lowering the dividend-paying capacity of firms. Consequently, firms attempt to preserve their cash flows by reducing their dividends. These findings conform to earlier evidence provided by Chang and Rhee(1990), Ferreira and Vilela, 2004,and Al-Najjar and Belghitar, 2011).

Information asymmetry problems offer another plausible explanation for the relationship between firm risk and dividend payouts. Excess free cash flow is associated with low firm risk yet higher agency problems. This exposes firms, with high free cash flow levels to strong demand from shareholders to payout their cash flow in the form of dividends instead of investing in projects that are likely to increase unsystematic risk. These results are consistent with the findings of Blau and Fuller (2008).

A parallel explanation to the negative association between risk and dividend policy is provided by the signalling theory. It states that investors perceive dividends as a signal of a change in risk, with an increase (decrease) in a firm's risk being associated with a decrease (increase) in the dividend payout ratio, consistent with Pettit (1977), Eades (1982), and Lloyd et al. (1985). The negative association between firm risks and the dividend payout ratio appears consistent with Lin et al. (2016). However, this association cannot be explained from a life cycle perspective given the negative relationship between unsystematic risk and the dividend payout ratio.

The negative association between the dividend payout ratio and unsystematic risk is also consistent with Baum et al. (2006). This could be interpreted as a tendency of firms with high levels of unsystematic risk to hold more liquid assets such as cash, which increases the probability of reduced payouts. The previous justification appears logical for the sample under study, especially given the consistently negative relationship reported between liquidity and the dividend payout ratio.

B. Dividend Policy Theories

Life Cycle and Residual Theories

The results reported in **Tables 5-15**to **5-18** show that the coefficient of earned capital (REE) exhibits a consistently negative and significant association with the dividend payout ratio for the entire sample of firms, for firms at all levels of payout, for firms of all sizes, and across all industrial sectors. This finding appears to be consistent survey results provided by Dhanani (2005) showing UK managers do not consider dividend retention a major source of financing new projects, despite it being a cheaper source. This could justify the payment of low dividends despite high levels of retained earnings. It appears that UK firms consider the factors that encourage dividend payment to be more important than the need to retain dividends to finance future investments. In addition, the dividend amounts might be insignificant to contribute sufficiently to future investment needs. The results, however, contradict the majority of studies, including DeAngelo et al. (2006), Denis and Osobov (2008), Hauser (2013), Rapp et al. (2014) and Banyi and Kahl (2014),which prove that companies in the mature stage have ample retained earnings and hence are capable of supporting high dividend payouts.

With respect to measures of firm growth, the above results provide mixed evidence. The coefficient of firm growth (g TA) is a positive and significant determinant of the dividend payout ratio for small-sized companies and firms that belong to the utilities sector. On the contrary, growth of total assets (g TA) is negative and significant for industrial and technology firms. The alternative proxy for firm growth (MB) shows a positive and significant association with the dividend payout ratio for the entire sample of companies, for small-sized firms and across all sectors except for services. The coefficient is, however, negative for technology firms **(see Appendix 5.4).** Therefore, the results are only robust for the entire sample of firms, for small-sized firms and for utilities. The fact that firms with strong growth opportunities have higher dividend payout ratios appears consistent with earlier findings from the UK (Bassidiq and Hussainey, 2010) showing the market-to-book ratio to be positively associated with dividend per share. This indicates that those firms tend to be highly profitable and large in size, meaning that they can accommodate high payout ratios while still satisfying their investment needs. Utilities report the highest level of profitability among all sectors, with a mean value of net operating profit to total assets of 8.5%. Firms that belong to this sector are also the largest in size, with an average log of total assets of 6.29. The results are also consistent with the findings of D'souza and Saxena (1999), Hoberg and Prabhala (2009) and Baker et al. (2013), who prove that companies with strong investment opportunities have a higher propensity to pay dividends. Another plausible explanation for the above results pertains to the tendency of UK firms to rely on debt as a source of financing for their investment needs.

On the other hand, the above results appear to contradict earlier empirical evidence from Farinha (2003), who uses the same proxies for firm growth, and from Al-Najjar and Belghitar (2011) and Alzahrani and Lasfer (2012) who use sales growth and the market-to-book ratio. They all prove investment opportunities to be negatively associated with dividend payments in the UK. Therefore, it appears that UK firms neither adhere to the life cycle theory of dividends nor to the residual theory. Due to the fact that firms with strong investment opportunities and low levels of retained earnings have high dividend payouts, it follows that dividends and investments are not direct substitutes for each other. This evidence lends support to the Modigliani and Miller (1961) argument in which dividends are paid irrespective of the investment opportunities available to the firm. This result either indicates that internal funds are in such abundance that they can satisfy both investment growth needs and dividend payouts, or that firms pay dividends out of available cash flows and rely on debt to finance their investment needs. The former explanation appears logical given the positive relationship between the dividend payout ratio and both cash flow and leverage. It is worth noting that UK equity markets have not traditionally been an important source of new capital for UK companies and that large companies rely intensively on internally generated funds that are more than sufficient to satisfy their investment needs (Kay, 2012).

The Agency Theory

The results reported in **Tables 5-15** to **5-18** show that institutional ownership (ISOWN) is negatively and significantly associated with the dividend payout ratio for the entire sample of firms, for small-sized firms and for industrial, service and other industry firms. This result is consistent with earlier findings by Khan (2006), Renneboog and Trojanowski (2011) and Al-Najjar and Hussainey (2011). A feasible explanation for the above relationship is the efficient monitoring exerted by institutional investors, which reduces the need for firms to pay dividends to overcome agency problems. In this respect, dividends and institutional ownership act as substitutes. Conversely, the coefficient is positive and significant for firms that belong to the utilities sector, conforming to earlier results by Grinstein and Michaely (2005) and Farinha (2003). The utilities' results also align with Huang and Paul (2016) and point to the presence of "value style" institutional investors that favour low-growth companies paying high dividends. This is justifiable given that utilities report the lowest annual growth rate of total assets, at 15.5%. Another plausible interpretation is that agency problems are more acute in firms with large shareholdings, necessitating the payment of higher dividends.

The other measure used to investigate the agency theory, insider ownership (INSIDE), shows a negative and significant relationship with the dividend payout ratio for the entire sample of firms, for companies with low dividend payout ratios and for firms across all sectors. The results are similar to those of Rozeff (1982) and show that, with low percentages of insider ownership, firms attempt to increase their dividend payouts. This could result from information asymmetry problems being higher in firms with low insider ownership. Such firms view their dividend policy as part of the monitoring package they use to mitigate agency problems; hence, they increase their payout ratios. The results are also consistent with Eckbo and Verma (1994), Chay and Suh (2007) and Florackis et al. (2015) and support the fact that an increase in insider ownership leads to a decrease in agency costs. Since managers bear more of the costs, they are insulated from external disciplining forces, reducing the need to pay high dividends.

Transaction Cost Theory

The majority of the results reveal that highly profitable large-sized firms have higher dividend payout ratios. For instance, large-sized firms have higher log of total assets (5.585), higher profitability (6.9%) and a higher payout ratio (33.2) than small-sized firms (4.718, 6.1% and 29.1% respectively).Larger firms are thus capable of paying high amounts of their earnings in the form of dividends and of raising external capital at low transaction costs. This finding is amplified by the negative association between liquidity and the dividend payout ratio. In this respect, firms with low liquidity pay high dividends and can raise any necessary funds externally due to their low transaction costs. This finding is in line with earlier studies such as Crutchley and Hansen (1989) and Basiddiq and Hussainey (2010).

C. Interaction between Firm Risks and Determinants of the Dividend Payout Ratio

This section provides the results on the interaction between measures of firm risk, including systematic and unsystematic risk, and determinants of the dividend payout ratio. The results represent an extension of the work of Bhattacharya et al. (2015), who confirm the existence of an interaction effect between unsystematic risk and measures of corporate governance on dividend payout propensity. They also show a negative effect of the three-way interaction term between unsystematic risk, free cash flow and corporate governance, on the propensity to pay out dividends.

Interaction between Firm Risks and Profitability

The results reported in **Tables 5-15** to **5-18** show that firms with higher profitability have higher dividend payout ratios whereas high-risk firms, in terms of both systematic and unsystematic risk, pay lower dividends. The interaction between systematic risk and profitability (SYS*NOPATTA) is negative and significant for the entire sample of firms, firms with a low dividend payout ratio and technology firms. Meanwhile, the interaction between unsystematic risk and profitability (UNSYS*NOPATTA) is negative and significant for the entire sample and for technology firms. This result means that systematic and unsystematic risks moderate the positive impact of profitability on the dividend payout ratio for the above-mentioned groups. On the other hand, the interaction term SYS*NOPATTA shows a positive and significant effect on the dividend payout ratio for large-sized firms and firms with high payout ratios. Meanwhile, UNSYS*NOPATTA has a positive and significant effect for firms of all sizes, all payout levels and service sector companies. This shows that unsystematic risk does not moderate the positive association between profitability and dividend payout ratio for the majority of groupings, since firms with high profitability can afford high dividend payments when their unsystematic risks are high. On the contrary, only large-sized firms and firms with high payouts can increase in their payout ratios at high levels of systematic risk, in line with the transaction cost theory (Basiddiq and Hussainey, 2010).

Interaction between Firm Risks and Free Cash Flow

The results reported in **Tables 5-15** to **5-18** show that free cash flow has a significantly positive association with the dividend payout ratio. The results for the interaction between free cash flow and systematic risk (SYS*FCFTA) show a positive and significant relationship with the dividend payout ratio for firms with high payout ratios and those in the technology sector. This result proves that, for the above-mentioned groups, companies with high free cash flow levels pay high dividend payouts even at high levels of systematic risk, as an attempt to reduce agency-related problems caused by excess cash flow. Conversely, the interaction term between unsystematic risk and free cash flow to total assets (UNSYS*FCFTA) has a negative and statistically significant coefficient for service sector firms and firms with low dividend payouts. The above findings appear in line with

Bhattacharya (2015). In this respect, as unsystematic risk increases, firms suffer from problems of underinvestment. Consequently, they reduce their dividend payouts and reserve their free cash flows for investment purposes. The coefficient of the interaction terms between cash flow per share and each of systematic and unsystematic risks (SYS*CFPS and UNSYS*CFPS) are positive and significant for the entire sample of firms, firms of all sizes, industrial, service and utility firms **(see Appendix 5.1).** This shows that both types of risk do have an impact on the positive association between cash flow per share and dividend payout ratio for the above-mentioned groups.

Interaction between Firm Risks and Liquidity

The results reported in **Tables 5-13** to **5-16** show that the coefficients of the interaction terms between cash to total assets and each of systematic and unsystematic risk (SYS*CASHTA and UNSYS*CASHTA) are negative and significant for the entire sample of firms and for industrial firms. This result corroborates earlier findings that firms with high liquidity have lower dividend payout ratios, especially when systematic and unsystematic risks are high. They preserve their liquidity and increase their cash holdings, especially at high levels of unsystematic risk, in an attempt to preserve their liquidity and increase their cash holdings. This conforms to Banyi and Kahl (2014) and indicates that an escalation in unsystematic risk encourages companies to increase their cash holdings rather than pay out their excess cash as dividends, lending support to the idea of precautionary motives for holding cash. However, the results are not robust for the above groupings when the interaction term between liquidity and firm risk uses the current ratio as the proxy for liquidity **(see Appendix 5.2).**

Interaction between Firm Risks and Firm Growth

The results reported in **Tables 5-13** to **5-16** show that the interaction effect between measures of firm growth and firm risk on the dividend payout ratio appears confined when growth of total assets is used a proxy of firm growth. The interaction term between systematic risk and growth of total assets (SYS*g TA) has a negative and significant coefficient for technology firms, but a positive and significant one for large-sized firms. Meanwhile, the interaction term between unsystematic risk and growth of total assets (UNSYS*g TA) has a positive and significant coefficient for industrial and utility firms. The results are robust to using the market-to-book ratio as the measure of firm growth in the interaction term with unsystematic risk for technology, industrial and utilities **(see Appendix 5.4).**The negative coefficient in the case of technology firms proves that the impact of risk complements firm growth and leads firms to decrease their dividend payout ratios as their growth opportunities increase. In this situation, firms face problems of underinvestment and prefer to direct their cash flows towards satisfying their investment needs. This evidence conforms to earlier findings by Panousi and Papanikolaou (2012), who prove that risk-averse managers tend to under invest at increased levels of firm risk. In the case of industrials and utilities, the positive coefficient of the interaction variable implies that firms belonging to those sectors can accommodate the high unsystematic risk accompanying firm growth, financing their investments with debt and still paying high dividends.

Interaction between Firm Risks and Earned Capital

The results reported in **Tables 5-15** to **5-18** show that, despite the consistently negative association between earned capital when considered by itself and the dividend payout ratio, the interaction between earned capital and each of systematic and unsystematic risk shows a positive effect. The coefficient of the interaction term with systematic risk (SYS*REE) is positive and significant for the entire sample of companies, for firms with small dividend payout ratios and for firms that belong to the industrial, technology and utilities sectors. Meanwhile, the interaction term with unsystematic risk (UNSYS*REE) shows a positive and significant association with the dividend payout ratio for the entire sample of firms and for industrial and utility companies.

Interaction between Firm Risks and Leverage

The results reported in **Tables 5-15** to **5-18** show that the interaction term between systematic risk and leverage (SYS*LTDTA) has a significantly positive effect for the entire sample of firms and for technology, utility and other industry firms. The results appear robust for firms that belong to utility and other industries when systematic risk interacts with the other measure of leverage, that is total debt-to-equity (SYS*DE) **(see Appendix 5.3).** The results corroborate the positive association between leverage by itself and the dividend payout ratio. In the case of firms in other industries, it appears they pay their excess cash flows in the form of dividends and raise required financing externally through debt. In the case of utilities, high financial leverage increases the level of monitoring by the capital markets. Consequently, debt commits these firms to disgorge cash flow in the form of dividends to constrain managers from using it to pursue personal goals, in line with Florackis (2015). Conversely, the interaction between unsystematic risk and leverage (UNSYS*LTDTA) shows a negative and significant association with the dividend payout ratio for large-sized firms. This implies that unsystematic risk moderates the impact of financial leverage for this group of firms. The previous finding appears rational for large-sized firms that show the highest level of financial leverage (mean LTDTA = 7.9%). Therefore, unsystematic risk induced by high indebtness places a strain on the free cash flows of those companies, thus lowering their dividend-paying capacity. The above results conform to earlier findings by Farinha (2003) and Renneboog and Trojanowski (2011).

Interaction between Firm Risks and Firm Size

The results reported in **Tables 5-15** to **5-18** show that the interaction between systematic risk and firm size (SYS*log TA) has a negative and significant effect on the dividend payout ratio for firms with low dividend payout ratios and for large-sized firms. The interaction term between unsystematic risk and firm size (UNSYS*log TA) also has a negative and significant effect for companies with low dividend payouts. This result conforms to the hypothesis that systematic and unsystematic risks moderate the positive impact of firm size on the dividend payout ratio. On the other hand, the coefficient of the interaction term UNSYS*log TA is positive and significant for large-sized firms and for firms that belong to services and other industries. This proves that, at high levels of both systematic and unsystematic risk, only large-sized firms can support high payout ratios.

Interaction between Firm Risks and Corporate Taxation

The results reported in **Tables 5-15** to **5-18** show that the interaction terms between corporate taxation and each of systematic and unsystematic risk (SYS*TAX and UNSYS*TAX) have positive and significant coefficients for industrial firms. This proves that corporate taxation (TAX) moderates the impact of systematic and unsystematic risks on the dividend payout ratio since the coefficient of the variable itself is consistently positive. On the contrary, the two interaction terms have negative and significant effects for companies with low dividend payout ratios. This result means that an increase in corporate tax rates is associated with low dividend payout ratios as both systematic and unsystematic risks increase.

Interaction between Firm Risks and Institutional Ownership

The coefficient of the interaction term between systematic risk and institutional ownership (SYS*ISOWN) is negative and significant for the full sample and for industrial and other industry firms. Similarly, the interaction term between unsystematic risk and institutional ownership (UNSYS*ISOWN) shows a negative and significant association with the dividend payout ratio for firms in those sectors. This result corroborates earlier findings and proves that institutional investors act as a substitute for dividends in mitigating agency-related problems, in line with Khan (2006). It further proves that, when systematic risk is high, companies with a large percentage of institutional ownership reduce their dividend payout ratios. Conversely, the latter interaction variable has a positive and significant effect for technology firms. This result means that institutional ownership is not considered an efficient monitoring mechanism in this sector with high unsystematic risk.

Interaction between Firm Risks and Insider Ownership

The results reported in **Tables 5-15** to **5-18** show that the interaction term between systematic risk and insider ownership (SYS*INSIDE) has a negative and significant coefficient for the full sample, firms with high payout ratios, small-sized firms and technology, utility and other industry firms. The interaction term between unsystematic risk and insider ownership (UNSYS*INSIDE) has a negative effect for the full sample. This finding ratifies the role of insider ownership as a substitute for dividends, since a large percentage of such ownership helps minimize information asymmetry problems, in line with Florackis et al. (2015).

5.3.2 GMM Results (Model 2) - Determinants of Dividend Payout Ratio and Financial Crisis Interaction Variables

Table 5-20: Model (2), Determinants of Dividend Payout Ratio, UK Non-financial Firms, Entire Sample, Financial Crisis Interaction

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Coefficients
Constant	-0.002
Profitability (NOPATTA)	0.562 (27.737) ***
Cash Flow(FCFTA)	0.097 (9.008) ***
Liquidity(CASHTA)	-0.012 (-1.072)
Earned Capital/Equity(REE)	-0.691 (-30.096) ***
Firm Growth (gTA)	3.696 (1.891) *
Leverage (LTDTA)	0.022 (0.442)
Corporate Tax (TAX)	0.328 (25.424) ***
Institutional Ownership (ISOWN)	-0.039 (-2.270) **
Insider Ownership (INSIDE)	-0.059 (-3.093) ***
Firm Size (log TA)	0.155 (11.737) ***
Systematic Risk (SYS)	-0.038 (-3.108)***
Unsystematic Risk (UNSYS)	-0.120 (-10.553) ***

Variable	Coefficients
2001	-0.058 (-2.321) **
Crisis	-0.187 (-0.489)
Crisis*Systematic Risk (Crisis*SYS)	-0.038 (-1.678) *
Crisis*Unsystematic Risk (Crisis*UNSYS)	-0.042 (-1.021)
Crisis* Cash Flow (Crisis*FCF)	0.007 (0.264)
Crisis*Leverage (Crisis*LTDTA)	0.171 (0.300)
Crisis* Firm Growth (Crisis*g TA)	-0.015 (-7.532)
Crisis*Firm Size (Crisis*log TA)	0.067 (1.278)
Crisis*Institutional Ownership (Crisis*ISOWN)	0.102 (3.213) ***
$\overline{R}^2$	34.52%
N	12,292
J-STATISTIC	27.28
SARGAN P-VALUE	0.2008

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage is the ratio of long-term debt to total assets (LTDTA). Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (Log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic Risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. 2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, log TA, and ISOWN). A dummy variable for Time is used in the regression.

Table 5- 21: Model (2), Determinants of Dividend Payout Ratio, UK Firms Grouped by Dividend Payout Ratio, Financial Crisis Interaction

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Above Average DPR	Below Average DPR
Constant	-0.001	0.007
Profitability (NOPATTA)	0.079 (2.055) **	0.170 (7.657) ***
Cash Flow(FCFTA)	0.040 (3.494) ***	0.027 (3.506) ***
Liquidity(CASHTA)	-0.012 (-0.508)	0.040 (0.030)
Earned Capital/Equity(REE)	-0.900 (-26.047) ***	-0.065 (-2.710) ***
Leverage (LTDTA)	0.019 (0.512)	0.058 (2.854) ***
Firm Growth (g TA)	0.013 (1.036)	-0.007 (-0.849)
Corporate Tax (TAX)	0.037 (1.937) *	0.124 (11.017) ***
Institutional Ownership (ISOWN)	-0.038 (-1.459)	-0.056 (-3.329) ***
Insider Ownership (INSIDE)	-0.001 (-0.022)	-0.035 (-1.724) *
Firm Size (log TA)	0.066 (1.629)	0.183 (7.592) ***
Systematic Risk (SYS)	0.019 (1.409)	-0.034 (-3.904) ***
Unsystematic Risk (UNSYS)	0.005 (0.328)	-0.076 (-7.301) ***
2001	0.009 (0.418)	0.011 (0.746)
Crisis	-0.229 (-0.802)	-0.037 (-0.251)
Crisis*Systematic Risk (Crisis*SYS)	-0.011 (-0.386)	-0.011 (-0.757)
Crisis*Unsystematic Risk (Crisis*UNSYS)	0.113 (0.678)	0.041 (0.505)
Crisis*FCF	0.043 (1.786) *	-0.025 (-2.206) **

Variable	Above Average DPR	Below Average DPR
Crisis*LTDTA	-0.106 (-2.003) **	0.011 (0.432)
Crisis*Firm Growth (Crisis*g TA)	0.026 (1.170)	0.003 (0.241)
Crisis*Firm Size (Crisis*log TA)	0.011 (0.069)	-0.032 (-0.369)
Crisis*Institutional Ownership (Crisis*ISOWN)	0.029 (0.400)	0.013 (0.417)
$\overline{R}^2$	58.82%	12.88%
N	3333	6650
J-STATISTIC	0.2161	49.33
SARGAN P-VALUE	25.75	20.33

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage is the ratio of long-term debt to total assets (LTDTA). Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (Log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic Risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. 2001 is a dummy variable for the year 2001. Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, log TA, and ISOWN). A dummy variable for Time is used in the regression.

Table 5-22: Model (2), Determinants of Dividend Payout Ratio, UK Firms Grouped by Firm Size (Log Market Capitalization), Financial Crisis Interaction

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Above Average MC	Below Average MC
Constant	-0.004	-0.003
Profitability (NOPATTA)	0.408 (11.881)***	0.475 (14.469)***
Cash Flow(FCFTA)	0.039 (5.299)***	0.039 (4.149)***
Liquidity(CASHTA)	-0.028 (-1.903)*	-0.003 (-0.201)
Leverage (LTDTA)	0.074 (3.725)***	0.123 (0.585)
Earned Capital/Equity(REE)	-0.634 (-16.794)***	-0.636 (-18.498)***
Firm Growth (g TA)	-0.034 (-4.011)***	0.076 (2.838)***
Systematic Risk (SYS)	-0.028 (-2.819)***	-0.028 (-1.649)*
Unsystematic Risk (UNSYS)	-0.065 (-5.735)***	-0.016 (-0.692)
Corporate Tax (TAX)	0.218 (14.732)***	0.251 (15.371)***
Institutional Ownership (ISOWN)	0.001 (0.047)	-0.039 (-1.060)
Insider Ownership (INSIDE)	0.022 (0.957)	-0.051 (-1.639)
Firm Size (log TA)	0.229 (7.796)***	0.179 (6.161)***
2001	-0.012 (-0.872)	0.019 (0.986)
Crisis	0.123 (0.762)	-0.006 (-0.031)
Crisis*Systematic Risk (Crisis*SYS)	-0.023 (-1.272)	-0.018 (-1.121)
Crisis*Unsystematic Risk (Crisis*UNSYS)	-0.132 (-1.385)	0.016 (0.555)
Crisis*Cash Flow (Crisis*FCF)	-0.014 (-1.145)	-0.040 (-1.642)
Crisis*Leverage (Crisis*LTDTA)	0.045	0.134

Variable	Above Average MC	Below Average MC
	(1.589)	(0.389)
Crisis*Firm Growth (Crisis*g TA)	0.008 (0.699)	0.007 (0.259)
Crisis*Firm Size (Crisis*log TA)	-0.004 (-0.049)	-0.014 (-0.260)
Crisis*Institutional Ownership (Crisis*ISOWN)	-0.008 (-0.240)	0.016 (0.542)
$\overline{R}^2$	30.32%	20.32%
N	5518	6179
J-STATISTIC	23.99	25.77
SARGAN P-VALUE	0.2428	0.2153

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage is the ratio of long-term debt to total assets (LTDTA). Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (Log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic Risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. 2001 is a dummy variable for the year 2001.Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, log TA, and ISOWN). A dummy variable for Time is used in the regression.

Table 5-23: Model (2), Determinants of Dividend Payout Ratio, Firms Grouped by Sector, Financial Crisis Interaction

This table presents GMM-in-system regression results forthe dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014, classified by sector. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions, asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Industrial	Technology	Service	Utility	Other Industries
Constant	3.05E-05	0.002	-0.002	0.005	0.001
Profitability (NOPATTA)	0.454 (14.052) ***	0.477 (7.039)***	0.617 (11.957)***	0.057 (0.709)	0.880 (19.167) ***
Cash Flow(FCFTA)	0.095 (4.014) ***	0.073 (1.839) *	-0.039 (-0.832)	0.697 (3.406)***	0.067 (1.764) *
Liquidity(CASHTA)	-0.042 (-2.879) ***	-0.037 (-1.071)	-0.163 (-4.799) ***	-0.245 (-4.489) ***	0.077 (2.840) ***
Leverage (LTDTA)	0.066 (2.431) **	-0.021 (-0.400)	-0.140 (-1.116)	0.286 (0.652)	0.528 (3.782) ***
Earned Capital/Equity (REE)	-0.609 (-18.994) ***	-0.436 (-6.007) ***	-0.687 (-12.418) ***	-0.337 (-5.001) ***	-0.997 (-20.775) ***
Firm Growth (g TA)	-0.112 (-6.027) ***	-0.139 (-3.910) ***	-0.044 (-0.576)	0.724 (3.984) ***	0.037 (1.092)
Systematic Risk (SYS)	-0.085 (-3.654)***	-0.022 (-0.535)	-0.053 (-0.846)	0.082 (0.588)	-0.046 (-1.325)
Unsystematic Risk (UNSYS)	-0.116 (-4.309) ***	-0.087 (-1.906)*	-0.085 (-1.345)	1.447 (1.295)	-0.134 (-3.518)***
Corporate Tax (TAX)	0.302 (15.487) ***	0.249 (6.431) ***	0.437 (10.865) ***	0.104 (1.307)	0.309 (12.868) ***

Variable	Industrial	Technology	Service	Utility	Other Industries
Firm Size (log TA)	0.179 (7.178) ***	0.012 (0.273)	-0.011 (-0.262)	-0.173 (-1.506)	0.199 (5.549) ***
Institutional Ownership (ISOWN)	0.026 (0.839)	-0.003 (-0.053)	-0.215 (-3.870) ***	-1.799 (-3.379) ***	-0.003 (-0.064)
Insider Ownership (INSIDE)	-0.043 (-1.615)	-0.060 (-1.414)	-0.119 (-2.027) **	0.028 (0.177)	-0.080 (-2.149) **
2001	-0.059 (-1.475)	-0.081 (-1.088)	-0.071 (-1.253)	0.109 (1.047)	-0.059 (-1.117)
Crisis	-0.122 (-2.702) ***	-0.069 (-0.952)	-0.179 (-1.344)	-1.152 (-2.351) **	-0.095 (-1.422)
Crisis*Systematic Risk (Crisis*SYS)	-0.007 (-0.306)	-01 (-0.004)	-0.040 (-0.611)	0.319 (2.685) ***	-0.063 (-1.821) *
Crisis*Unsystematic Risk (Crisis*UNSYS)	-0.009 (-0.362)	0.010 (0.286)	-0.015 (-0.225)	1.529 (1.358)	-0.063 (-1.747)*
Crisis* Cash Flow (Crisis*FCF)	-0.001 (-0.023)	-0.003 (-0.068)	-0.099 (-2.164) **	0.809 (3.645) ***	0.004 (0.103)
Crisis*Leverage (Crisis*LTDTA)	0.026 (1.125)	-0.113 (-3.017) ***	-0.182 (-1.193)	0.093 (0.212)	0.027 (0.127)
Crisis*Firm Growth (Crisis*g TA)	-0.032 (-1.512)	-0.022 (-0.598)	-0.092 (-1.130)	0.635 (3.208) ***	0.069 (2.109) **
Crisis*Firm Size (Crisis*log TA)	0.117 (2.539) **	0.300 (4.673) ***	0.111 (1.868) *	3.571 (2.202) **	-0.058 (-0.499)
Crisis*ISOWN	0.069 (2.553) **	0.049 (1.135)	-0.034 (-0.845)	1.652 (3.059) ***	0.067 (1.977) **
$\overline{R}^2$	30.64%	25.29%	35.38%	8.39%	26.23%
N	4803	1394	1378	266	3390
J-STATISTIC	24.98	27.28	22.38	23.44	24.87
SARGAN P-VALUE	0.298	0.2442	0.2157	0.3211	0.3033

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage is the ratio of long-term debt to total assets (LTDTA). Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (Log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic Risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. 2001 is a dummy variable for the year 2001.Crisis is a dummy variable for the years 2008 and 2009. Crisis*X are interaction variables between the Crisis dummy and each variable X respectively (where X is SYS, UNSYS, FCFTA, LTDTA, gTA, log TA, and ISOWN). A dummy variable for Time is used in the regression.

A. Determinants of Dividend Payout Ratio and Financial Crisis Interaction Variables

The results for Model (2) presented in **Tables 5-19** to **5-22** are very similar to the results of Model (1) with respect to the determinants of the dividend payout ratio. This holds with the exception of changes in the significance of some of the coefficients. In this section, the researcher discusses the results of the impact of the global financial crisis on the dividend policies of UK firms, and extends the work of Akbar et al. (2015), Driver et al. (2015) and Bliss et al. (2015), who use interaction terms for the crisis dummy to study the impact of the global financial crisis on dividend policy in the UK and US respectively.

2001

The results show that the dummy variable 2001 has a negative and significant effect on the dividend payout ratio for the entire sample of UK firms. This indicates that, when considering the full sample, companies appear to have decreased their payout ratios during the dot-com bubble of 2001. However, the coefficient is insignificant for companies grouped by payout ratio, firm size, and sector. This insignificance is in line with Bliss et al. (2015) and proves that UK firms did not reduce their payout in the year 2001, consistent with evidence from the US. Therefore, the impact of 2001's economic recession, caused by the burst of the dot-com bubble, on the dividend policies of UK firms, appears limited.

Financial Crisis (2008-2009)

The crisis dummy variable has a negative and significant coefficient only for industrial and utility firms. This indicates that only firms from those two sectors reduced their dividend payout ratios during the financial crisis. The insignificance of the crisis dummy variable in the rest of the groupings proves that the crisis per se did not affect the payout ratios of firms.

The first set of interaction variables tests whether the impact of the crisis on the dividend payout ratio was stronger for firms that would appear to have been more susceptible to the effects of the credit supply shock caused by the crisis. This includes firms with high financial leverage, low liquidity[10] and high firm growth. The second set of interaction variables tests whether the demand shock during the crisis reduced the need for funds. In other words, investment opportunities would have declined and companies could have paid their excess cash flows as dividends. This set of variables includes the interaction of the crisis dummy with firm growth, cash flow and firm size. The third set of interaction variables focus on the role of institutional investors in reducing agency problems during the financial crisis. The final set of interaction variables test the impact of systematic and unsystematic risk on dividend payouts during the crisis.

The coefficient of the interaction variable between the crisis dummy variable and systematic risk (Crisis*SYS) is negative and significant for the entire sample of companies and for firms that belong to other industries. This indicates a negative impact of systematic risk on the dividend payout ratio during the crisis period. The coefficient is positive and significant for utilities. This shows that utility firms with high systematic risk increased their dividend payout ratios during the crisis. One possible explanation is the tendency of firms to use dividends as a signalling device; thus they may have used them to demonstrate their financial stability during the crisis period. Similarly, the interaction variable between the crisis dummy variable and unsystematic risk (Crisis*UNSYS) is negative and statistically significant for firms that belong to other industries. The coefficient of this variable is insignificant for all other groupings, indicating that the crisis did not have an impact on the association between unsystematic risk and dividend payout ratio.

The results show that the interaction variable between the crisis dummy and free cash flow (Crisis*FCFTA) has a positive and significant effect for firms with high dividend payout ratios and utility firms. The results are similar to those of Bliss et al. (2015) and appear consistent with the evidence that large-sized firms with high cash flow reserves refrain from responding to demand shocks with dividend reductions. Another possible

[10]The interaction variables between the crisis dummy variable and the liquidity measures, Crisis*CASHTA and Crisis*CR, were eliminated from the regression due to having VIFs greater than 5.

interpretation is the intensity of problems of information asymmetry caused by investment opportunities becoming more limited under demand shocks. In this instance, firms could increase their payout ratios to minimize agency-related problems and signal a stable financial condition, similarly to in Smits (2012). This evidence holds for the entire sample of firms and for industrial, utilities and other industry firms. In particular, the coefficient of the interaction term between the crisis dummy and institutional ownership (Crisis*ISOWN) is positive and significant.

The findings show that the interaction between the crisis dummy and leverage (Crisis*LTDTA) has a negative and significant coefficient for companies with high dividend payout ratios and technology firms. In other words, the negative impact of the crisis on the payout ratio is greater for highly leveraged firms, particularly for those two groups. This amplifies the effect of the credit supply shock and financial frictions on those groups of firms, namely that they preserve their cash flow and reduce their dividend payouts as an alternative source of funds. This finding conforms to Bliss et al. (2015), who report the tendency of highly leveraged firms to reduce their cash dividends during the crisis. The results are also in line with Driver et al. (2015), who find highly leveraged UK firms to have paid lower dividends during the financial crisis.

The interaction variable between the crisis dummy and firm growth (Crisis*gTA) is positive and significant only for utilities firms and firms from other industries. This contradicts earlier findings by Bliss et al. (2015), who prove investment opportunities insignificantly associated with dividend payout reduction during the financial crisis. This evidence appears more relevant to the explanation of demand shocks during the crisis, since cash flows appear to have been more ample and hence companies could have honoured their dividend payments to solve agency-related problems even at increased levels of firm growth.

The impact of firm size on the dividend payout ratio is positive and significant, as evident from the coefficient of the interaction between the crisis dummy and firm size (Crisis*log TA), for all sectors except for other industries. This may show that firm size is associated with high cash flow levels that are used in dividend payouts to minimize agency problems.

5.3.3 Model (3), Impact of Causes of De-listing on Dividend Payout Ratio

Table 5-24: Impact of Causes of De-listing on Dividend Payout Ratio

This table presents GMM-in-system regression results for 769UKde-listed firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Coefficient
Constant	0.001
Profitability (NOPATTA)	0.476 (9.879)***
Cash Flow(FCFTA)	0.048 (3.423)***
Liquidity(CASHTA)	-0.012 (-0.557)
Leverage (LTDTA)	0.056 (0.932)
Earned Capital/Equity(REE)	-0.615 (-9.828)***
Firm Growth (gTA)	0.022 (1.284)
Systematic Risk (SYS)	0.049 (0.191)
Unsystematic Risk (UNSYS)	-0.373 (-1.286)
Corporate Tax (TAX)	0.216 (7.589)***
Institutional Ownership (ISOWN)	-0.063 (-2.642)***
Insider Ownership (INSIDE)	-0.011 (-0.361)
Firm Size (log TA)	0.144 (2.640)***
Acquisition (ACQ)	-0.649 (-0.401)
In Administration (ADMIN)	1.209 (0.818)
Scheme of Arrangement (ARRANGE)	-0.582 (0.561)

Variable	Coefficient
Company Request (COREQ)	1.174 (0.621)
Liquidation (LIQ)	0.359 (0.378)
In Receivership (RECEIV)	-0.294 (-0.296)
Exchanged Into (EXCHANGE)	0.225 (0.127)
No Longer Meeting Listing Requirements (NMLR)	-1.136 (-1.232)
Merger (MERGE)	-1.177 (-3.371)***
Private Company (PRIV)	-1.052 (-1.622)
$\overline{R}^2$	0.53%
N	3840
J-STATISTIC	23.67
SARGAN P-VALUE	0.166

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow divided by total assets. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage is the ratio of long-term debt to total assets (LTDTA). Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic Risk (Unsys) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk. Acquisition (ACQ) is a dummy variable that takes the value 1 for companies de-listed due to acquisition and 0 otherwise. In Administration (ADMIN) is a dummy variable that takes the value 1 for companies de-listed due to being in administration and 0 otherwise. Scheme of Arrangement (ARRANGE) is a dummy variable that takes the value 1 for companies de-listed due to a scheme of arrangement and 0 otherwise. Company Request (COREQ) is a dummy variable that takes the value 1 for companies de-listed due to company request and 0 otherwise. Liquidation (LIQ) is a dummy variable that takes the value 1 for companies de-listed due to liquidation or bankruptcy and 0 otherwise. In Receivership (RECEIV) is a dummy variable that takes the value 1 for companies de-listed due to being in receivership and 0 otherwise. Exchanged Into (EXCHANGE) is a dummy variable that takes the value 1 for companies de-listed due to being exchanged into another name and 0 otherwise. No Longer Meeting Listing Requirements (NMLR) is a dummy variable that takes the value 1 for companies de-listed due to their inability to meet the listing requirements and 0 otherwise. Merger (MERGE) is a dummy variable that takes the value 1 for companies de-listed due to being merged with another entity and 0 otherwise. Private Company (PRIV) is a dummy variable that takes the value 1 for companies de-listed due to being privatized and 0 otherwise.

The above results indicate that cause of de-listing does not have a significant impact on the dividend payout ratio in the five-year period before de-listing occurs. This result holds for all causes except for MERGER, whose coefficient is negative and significant. This shows that companies that go through a merger exhibit a decrease in dividend payout ratio during the five year prior to their de-listing.

N.B. Goodness-of-fit tests were carried out for the de-listed sample but are omitted for space reasons. The results are available upon request.

5.4 Chapter Summary

This chapter of the study is an extension of the empirical work published on corporate dividend policy. The chapter investigates the determinants of the dividend payout ratio for a sample of 1340 UK non-financial firms in the period 1991-2014. It also examines some of the theories on dividend policy, such as the life cycle theory, the agency theory,the free cash flow hypothesis, transaction cost theory and residual theory. The study utilizes a panel data methodology and goodness-of-fit tests are carried out to ensure the proper treatment of the data. The results represent an extension to the previous literature through the empirical examination of the determinants of the dividend payout ratio and the interaction between those determinants and each of systematic and unsystematic risk, as presented in Model (1). This chapter also focuses on the impact of the global financial crisis on dividend payouts in the UK, as presented in Model (2). The impact of cause of de-listing on the dividend payout ratios of de-listed firms is presented in Model (3). The dynamic nature of panel data, coupled with the issue of endogeneity proved through the Hausman test for endogeneity,necessitated the use of an instrumental variable technique,namely GMM. The robustness of the results is verified through the use of different proxies for some of the explanatory variables and by means of controlling for the dividend payout ratio, firm size and sector.

The findings robustly prove that systematic and unsystematic risks, corporate earnings, earned capital and firm size are determinants of the dividend payout ratio across all groupings. Concerning dividend policy theories, UK firms appear to abide by the transaction cost theory, the agency theory and the free cash flow hypothesis, while only technology firms align to the residual theory of dividends. The significant associations between the dividend payout ratio and each of profitability, systematic and unsystematic risk reflect the tendency of firms to use dividends as a signalling mechanism. The results also show that firm risks influence the relationship between the dividend payout ratio and its determinants. The interaction variables examined in the study,on top of the use of different proxies for dividend policy drivers, provides robustness to the results of the study.

The impact of the global financial crisis appears confined to utilities,which are more susceptible to demand shocks. Consequently, they increased their dividend payout ratios as a means of mitigating agency problems. On the other hand, large-sized and industrial firms appear to have decreased their payouts to preserve their cash flows, in response to credit supply shocks.

Appendix 5-1: Determinants of Dividend Payout Ratio with Cash Flow Measured by Cash Flow per Share (CFPS)

Table 1: Determinants of Dividend Payout Ratio, UK Non-Financial Firms, Entire Sample, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Coefficient
Constant	-0.001
Profitability (NOPATTA)	0.555 (37.961)***
Cash Flow(CFPS)	***0.002*** ***(0.191)***
Liquidity(CASHTA)	-0.016 (-1.974) **
Earned Capital/Equity(REE)	-0.698 (-45.193) ***
Leverage (LTDTA)	0.039 (3.608) ***
Firm Growth (g TA)	2.081 (1.113)
Corporate Tax (TAX)	0.306 (30.965) ***
Institutional Ownership (ISOWN)	-0.024 (-1.929) *
Insider Ownership (INSIDE)	-0.068 (-4.383) ***
Firm Size (log TA)	0.164 (14.292) ***
Systematic Risk (SYS)	-0.036 (-3.906) ***
Unsystematic Risk (UNSYS)	-0.114 (-11.241) ***
Systematic Risk* Profitability (SYS*NOPATTA)	-0.075 (-4.345) ***
Systematic Risk* Cash Flow (SYS*CFPS)	0.095 (7.199) ***
Systematic Risk* Liquidity (SYS*CASHTA)	-0.028 (-3.212) ***
Systematic Risk* Firm Growth (SYS*g TA)	-0.005 (-0.546)

Variable	Coefficient
Systematic Risk* Earned Capital (SYS*REE)	0.059 (3.123) ***
Systematic Risk* Leverage (SYS*LTDTA)	0.021 (1.818) *
Systematic Risk* Firm Size (SYS*log TA)	-0.060 (-5.021) ***
Systematic Risk* Corporate Taxation (SYS*TAX)	-0.013 (-1.266)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.016 (-1.231)
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.036 (-2.463) **
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	-0.066 (-3.709) ***
Unsystematic Risk* Cash Flow (UNSYS*CFPS)	0.184 (13.625) ***
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.020 (-2.234) **
Unsystematic Risk* Firm Growth (UNSYS*g TA)	0.006 (0.739)
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.123 (6.412) ***
Unsystematic Risk* Leverage (UNSYS*LTDTA)	0.002 (0.133)
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.099 (-8.969) ***
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.005 (0.432)
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.009 (-0.723)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.033 (-2.195) **
$\overline{R}^2$	37.55%
N	12,292
J-STATISTIC	34.813
SARGAN P-VALUE	0.2108

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, CFPS, CASHTA, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 2: Determinants of Dividend Payout Ratio, UK Firms Grouped by Dividend Payout Ratio, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Above Average DPR	Below Average DPR
Constant	0.003	0.001
Profitability (NOPATTA)	0.013 (0.306)	0.115 (1.442)
Cash Flow(CFPS)	***1.578*** ***(3.391)****	***0.271*** ***(1.653)****
Liquidity(CASHTA)	0.129 (0.736)	-0.160 (-1.014)
Earned Capital/Equity(REE)	-0.635 (-8.199) ***	-0.488 (-4.451)***
Leverage (LTDTA)	-0.001 (-0.012)	0.139 (2.450) **
Firm Growth (gTA)	0.039 (0.791)	-0.009 (-0.139)
Corporate Tax (TAX)	0.077 (3.798) ***	0.138 (10.304) ***
Institutional Ownership (ISOWN)	0.246 (0.388)	-0.053 (-1.098)
Insider Ownership (INSIDE)	-0.009 (-0.200)	-0.098 (-2.623) ***
Firm Size (log TA)	0.177 (3.032) ***	0.031 (0.492)
Systematic Risk (SYS)	0.044 (1.011)	-0.054 (-2.191) **
Unsystematic Risk (UNSYS)	1.395 (3.988) ***	-0.243 (-3.318) ***
Systematic Risk* Profitability (SYS*NOPATTA)	0.027 (1.549)	-0.186 (-2.667) ***
Systematic Risk* Cash Flow (SYS*CFPS)	-0.009 (-0.176)	-0.027 (-1.213)
Systematic Risk* Liquidity (SYS*CASHTA)	0.006 (0.197)	0.025 (0.882)
Systematic Risk* Firm Growth (SYS*g TA)	-0.016 (-0.839)	0.020 (1.269)

Variable	Above Average DPR	Below Average DPR
Systematic Risk* Earned Capital (SYS*REE)	-0.031 (-1.119)	0.268 (3.668) ***
Systematic Risk* Leverage (SYS*LTDTA)	0.047 (2.238) **	0.004 (0.252)
Systematic Risk* Firm Size (SYS*log TA)	0.013 (0.747)	-0.036 (-2.956) ***
Systematic Risk* Corporate Tax (SYS*TAX)	0.013 (0.956)	-0.032 (-3.669) ***
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.029 (-1.429)	-0.019 (-1.224)
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.026 (-1.068)	0.003 (0.219)
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.055 (2.604) ***	0.274 (2.693) ***
Unsystematic Risk* Cash Flow (UNSYS*CFPS)	-1.787 (-3.811) ***	-0.134 (-0.891)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.169 (-0.927)	0.168 (1.024)
Unsystematic Risk* Firm Growth (UNSYS*g TA)	-0.019 (-0.431)	-0.012 (-0.204)
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.255 (-4.097) ***	0.093 (0.868)
Unsystematic Risk* Leverage (UNSYS*LTDTA)	0.003 (0.045)	-0.068 (-1.336)
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.043 (1.902) *	-0.025 (-1.683) *
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.003 (0.171)	-0.042 (-2.943) ***
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.044 (-0.692)	-0.046 (-0.821)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.026 (-0.955)	-0.016 (-0.902)
$\bar{R}^2$	57.14%	11.16%
N	12,292	6650
J-STATISTIC	34.23	34.49
SARGAN P-VALUE	0.2721	0.2221

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, CFPS, CASHTA, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 3: Model (1): Determinants of Dividend Payout Ratio, UK Firms Grouped by Firm Size, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Above Average MC	Below Average MC
Constant	-0.005	0.001
Profitability (NOPATTA)	-0.143 (-2.262)**	0.396 (12.403)***
Cash Flow(CFPS)	***-0.410*** ***(-2.955)* *****	***0.174*** ***(6.141)* *****
Liquidity(CASHTA)	0.161 (1.451)	-0.009 (-0.591)
Earned Capital/Equity(REE)	-0.295 (-3.684)***	-0.681 (-19.702)***
Leverage (LTDTA)	0.274 (4.916)***	0.019 (0.498)
Firm Growth (gTA)	-0.018 (-0.665)	0.049 (4.952)***
Corporate Tax (TAX)	0.186 (10.459)***	0.225 (13.802)***
Institutional Ownership (ISOWN)	0.049 (1.103)	-0.061 (-2.385)**
Insider Ownership (INSIDE)	0.012 (0.509)	-0.035 (-1.165)
Firm Size (Log TA)	0.114 (2.687)***	0.112 (3.544)***
Systematic Risk (SYS)	-0.079 (-2.879)***	0.009 (0.885)
Unsystematic Risk (UNSYS)	-0.210 (-3.143)***	-0.026 (-1.699)*
Systematic Risk* Profitability (SYS*NOPATTA)	0.022 (0.311)	0.013 (0.697)
Systematic Risk* Cash Flow (SYS*CFPS)	0.539 (2.421)**	0.032 (2.418)**
Systematic Risk* Liquidity (SYS*CASHTA)	-0.137 (-2.912)***	-0.002 (-0.186)
Systematic Risk* Firm Growth (SYS*g TA)	0.054 (2.641)***	0.004 (0.444)
Systematic Risk* Earned Capital (SYS*REE)	-0.189	0.022

Variable	Above Average MC	Below Average MC
	(-3.102) ***	(1.048)
Systematic Risk* Leverage (SYS*LTDTA)	-0.109 (-2.418) **	-0.001 (-0.068)
Systematic Risk* Firm Size (SYS*log TA)	-0.098 (-2.904) ***	0.002 (0.155)
Systematic Risk* Corporate Tax (SYS*TAX)	-0.007 (-0.464)	-0.015 (-1.131)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.029 (-1.342)	0.006 (0.324)
Systematic Risk*Insider Ownership (SYS*INSIDE)	0.012 (0.736)	-0.054 (-2.682) ***
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.570 (6.911) ***	0.048 (2.471) **
Unsystematic Risk* Cash Flow (UNSYS*CFPS)	0.188 (2.299) **	0.063 (4.133) ***
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.167 (-1.472)	0.007 (0.600)
Unsystematic Risk* Firm Growth (UNSYS*g TA)	-0.020 (-0.817)	-0.003 (-0.321)
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.279 (-3.413) ***	0.014 (0.688)
Unsystematic Risk* Leverage (UNSYS*LTDTA)	-0.190 (-4.687) ***	-0.004 (-0.279)
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.003 (0.175)	0.005 (0.383)
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	-0.016 (-1.245)	-0.026 (-1.932) *
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.008 (-0.179)	-0.019 (-1.222)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.001 (-0.067)	-0.024 (-0.975)
$\overline{R}^2$	26.67%	23.82%
N	5516	6179
J-STATISTIC	33.70	35.64
SARGAN P-VALUE	0.2929	0.301

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, CFPS, CASHTA, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 4: Model (1): Determinants of Dividend Payout Ratio, Firms Grouped by Sector, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014, classified by sector. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	**Industrial**	**Technology**	**Service**	**Utility**	**Other Industries**
Constant	0.002	0.009	-0.008	0.009	0.001
Profitability (NOPATTA)	0.408 (16.759) ***	0.449 (4.417)***	-0.022 (-0.701)	-0.058 (-0.983)	0.692 (22.368) ***
Cash Flow(CFPS)	***0.090*** ***(4.244) ******	***0.296*** ***(1.525)***	***0.156*** ***(4.715)******	***0.155*** ***(2.878) ******	***0.085*** ***(5.194) ******
Liquidity(CASHTA)	-0.049 (-3.609) ***	-0.088 (-3.267) ***	-0.147 (-6.509) ***	-0.138 (-3.857) ***	-0.001 (-0.109)
Earned Capital/Equity(REE)	-0.618 (-24.131) ***	-0.638 (-5.175) ***	-0.736 (-15.953) ***	-0.307 (-4.534) ***	-0.852 (-24.117) ***
Leverage (LTDTA)	0.015 (0.787)	-0.001 (-0.022)	-0.028 (-0.904)	0.427 (4.445) ***	0.029 (1.415)
Firm Growth (g TA)	-0.069 (-0.514) ***	-0.087 (-3.498) ***	-0.003 (-0.133)	0.209 (3.476) ***	-0.007 (-0.452)
Corporate Tax (TAX)	0.259 (16.821) ***	0.247 (5.536) ***	0.402 (14.855) ***	0.076 (1.317)	0.291 (16.381) ***
Institutional Ownership (ISOWN)	0.115 (4.976) ***	-0.022 (-0.629)	-0.158 (-3.398) ***	0.519 (4.655) ***	-0.066 (-2.612) ***
Insider Ownership (INSIDE)	-0.027 (-1.362)	-0.136 (-3.692) ***	-0.144 (-2.791) ***	-15.432 (-4.003) ***	-0.106 (-3.980) ***

Variable	Industrial	Technology	Service	Utility	Other Industries
Firm Size (log TA)	-0.049 (-2.284) **	-0.158 (-1.305)	-0.073 (-2.059) **	-0.229 (-3.058) ***	0.149 (6.621) ***
Systematic Risk (SYS)	-0.092 (-5.378) ***	-0.047 (-1.664) *	-0.022 (-0.701)	-1.905 (-4.099) ***	-0.044 (-2.035) **
Unsystematic Risk (UNSYS)	-0.118 (-6.431) ***	0.127 (1.413)	-0.022 (-0.639)	23.242 (4.176) ***	-0.121 (-5.174) ***
Systematic Risk* Profitability (SYS*NOPATTA)	-0.053 (-2.260) **	-0.245 (-2.993) ***	-0.058 (-1.654) *	0.015 (0.184)	-0.017 (-0.665)
Systematic Risk* Cash Flow (SYS*CFPS)	0.093 (4.182) ***	0.141 (0.672)	0.097 (2.898) ***	0.244 (4.556) ***	0.021 (1.136)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.029 (-2.001) **	-0.020 (-0.744)	0.033 (1.534)	-0.072 (-1.538)	-0.011 (-0.603)
Systematic Risk* Firm Growth (SYS*g TA)	-0.015 (-1.063)	-0.032 (-1.089)	-0.007 (-0.304)	-0.011 (-0.216)	-0.006 (-0.386)
Systematic Risk* Earned Capital (SYS*REE)	0.068 (2.618) ***	0.194 (2.523) **	0.003 (0.834)	0.227 (3.263) ***	0.051 (1.692) *
Systematic Risk* Leverage (SYS*LTDTA)	0.021 (1.097)	0.051 (1.532)	-0.042 (-1.187)	0.255 (3.679) ***	0.047 (2.176) **
Systematic Risk* Firm Size (SYS*log TA)	-0.031 (-1.595)	-0.092 (-0.856)	0.008 (0.322)	-0.147 (-2.237) **	-0.025 (-1.280)
Systematic Risk* Corporate Tax (SYS*TAX)	0.016 (0.937)	-0.009 (-0.249)	-0.042 (-1.570)	-0.005 (-0.081)	0.009 (0.469)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.029 (-1.806) *	0.036 (0.998)	0.016 (0.456)	0.025 (0.278)	-0.038 (-1.959) *
Systematic Risk*Insider Ownership (SYS*INSIDE)	0.003 (0.141)	-0.099 (-2.373) **	-0.053 (-1.497)	-19.755 (-4.066) ***	-0.035 (-1.776) *
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	-0.037 (-1.745) *	-0.177 (-3.472) ***	0.055 (1.482)	0.196 (2.632) ***	0.042 (1.495)

Variable	Industrial	Technology	Service	Utility	Other Industries
Unsystematic Risk* Cash Flow (UNSYS*CFPS)	0.184 (8.746) ***	-0.262 (-1.598)	0.108 (3.475) ***	0.322 (5.907) ***	0.021 (1.043)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.022 (-1.560)	-0.002 (-0.055)	0.003 (0.146)	-0.071 (-1.745) *	0.008 (0.492)
Unsystematic Risk* Firm Growth (UNSYS*g TA)	0.041 (2.933) ***	-0.021 (-0.866)	-0.032 (-1.332)	0.260 (3.603) ***	0.020 (1.162)
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.116 (5.082) ***	0.084 (1.334)	0.019 (0.509)	-0.015 (-0.239)	0.059 (1.941) *
Unsystematic Risk* Leverage (UNSYS*LTDTA)	0.012 (0.702)	-0.071 (-1.867) *	-0.006 (-0.183)	0.042 (0.668)	0.011 (0.593)
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.099 (-5.565) ***	0.050 (1.354)	0.042 (2.028) **	-0.062 (-0.933)	0.034 (2.042) **
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.052 (3.109) ***	0.191 (1.921) *	-0.043 (-1.551)	0.039 (0.604)	0.026 (1.377)
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.039 (-2.564) **	0.045 (1.562)	0.006 (0.161)	0.317 (3.232) ***	-0.068 (-3.402) ***
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	0.015 (0.669)	-0.023 (-0.541)	0.054 (1.343)	23.127 (4.147) ***	-0.0002 (-0.016)
$\overline{R}^2$	35.09%	20.37%	37.64%	40.15%	40.22%
N	4803	1395	1378	267	3391
J-STATISTIC	35.95	34.90	34.74	34.75	36.18
SARGAN P-VALUE	0.2481	0.2877	0.2946	0.2519	0.2796

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (CFPS) is measured by cash flow per share. Liquidity (Cash/TA) is measured as the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, CFPS, CASHTA, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Appendix 5-2: Determinants of Dividend Payout Ratio with Liquidity Measured by Current Ratio

Table 1: Determinants of Dividend Payout Ratio, UK Non-Financial Firms, Entire Sample, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Coefficient
Constant	-0.002
Profitability (NOPATTA)	0.554 (34.763) ***
Cash Flow(FCFTA)	0.081 (9.782) ***
Liquidity(CR)	***-0.055 (-5.943) ******
Earned Capital/Equity(REE)	-0.707 (-44.216) ***
Leverage (LTDTA)	0.033 (2.943) ***
Firm Growth (g TA)	4.172 (1.226)
Corporate Tax (TAX)	0.307 (31.233) ***
Institutional Ownership (ISOWN)	-0.016 (-1.332)
Insider Ownership (INSIDE)	-0.068 (-4.803) ***
Firm Size (log TA)	0.143 (14.544) ***
Systematic Risk (SYS)	-0.034 (-3.791) ***
Unsystematic Risk (UNSYS)	-0.114 (-11.559) ***
Systematic Risk* Profitability (SYS*NOPATTA)	-0.051 (-2.972) ***
Systematic Risk* Cash Flow (SYS*FCFTA)	0.005 (0.522)
Systematic Risk* Liquidity (SYS*CR)	-0.024 (-1.898) *
Systematic Risk* Firm Growth (SYS*g TA)	-0.007 (-0.788)
Systematic Risk* Earned Capital (SYS*REE)	0.077

Variable	Coefficient
	(4.268) ***
Systematic Risk* Leverage (SYS*LTDTA)	0.022 (1.872) *
Systematic Risk* Firm Size (SYS*log TA)	-0.011 (-1.098)
Systematic Risk* Corporate Taxation (SYS*TAX)	-0.001 (-0.083)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.029 (-2.224) **
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.033 (-2.305) **
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	-0.026 (-1.347)
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	-0.004 (-0.365)
Unsystematic Risk* Liquidity (UNSYS*CR)	-0.042 (-1.486)
Unsystematic Risk* Firm Growth (UNSYS*g TA)	-0.004 (-0.427)
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.165 (8.757) ***
Unsystematic Risk* Leverage (UNSYS*LTDTA)	0.001 (0.069)
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.015 (-1.455)
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.022 (2.007) **
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.013 (-1.037)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.035 (-2.353) **
$\overline{R}^2$	36.95%
N	12,292
J-STATISTIC	34.909
SARGAN P-VALUE	0.2878

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CR) is measured by current ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, CFPS, CR, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 2: Determinants of Dividend Payout Ratio, UK Firms Grouped by Dividend Payout Ratio, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square.The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	**Above Average DPR**	**Below Average DPR**
Constant	0.001	-0.0002
Profitability (NOPATTA)	0.001	0.104 (1.266)
Cash Flow(FCFTA)	0.038 (3.661)***	0.031 (3.078)***
Liquidity(CR)	***0.051 (0.463)***	***0.081 (0.396)***
Earned Capital/Equity(REE)	-0.698 (-8.865)***	-0.434 (-4.117)***
Leverage (LTDTA)	0.065 (1.107)	0.154 (2.793)***
Firm Growth (gTA)	0.031 (0.653)	-0.017 (-0.263)
Corporate Tax (TAX)	0.096 (4.848)***	0.149 (10.945)***
Institutional Ownership (ISOWN)	0.022 (0.362)	-0.069 (-1.423)
Insider Ownership (INSIDE)	0.016 (0.372)	-0.093 (-2.398)**
Firm Size (log TA)	0.081 (1.978)**	0.095 (1.491)
Systematic Risk (SYS)	0.032 (0.559)	-0.073 (-1.302)
Unsystematic Risk (UNSYS)	0.295 (2.168)**	-0.163 (-0.895)
Systematic Risk* Profitability (SYS*NOPATTA)	0.016 (0.950)	-0.174 (-2.586)***
Systematic Risk* Cash Flow (SYS*FCFTA)	0.033 (2.783)***	0.002 (0.108)
Systematic Risk* Liquidity (SYS*CR)	-0.004 (-0.072)	0.023 (0.340)
Systematic Risk* Firm Growth (SYS*g TA)	-0.009 (-0.517)	0.023 (1.429)
Systematic Risk* Earned Capital (SYS*REE)	-0.033 (-1.214)	0.249 (3.672)***

Variable	**Above Average DPR**	**Below Average DPR**
Systematic Risk* Leverage (SYS*LTDTA)	0.036 (1.840) *	-0.083 (-1.648) *
Systematic Risk* Firm Size (SYS*log TA)	-0.007 (-0.513)	-0.044 (-3.452) ***
Systematic Risk* Corporate Taxation (SYS*TAX)	0.016 (1.331)	-0.047 (-3.676) ***
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.019 (-0.960)	-0.013 (-0.812)
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.054 (-2.192) **	0.002 (0.172)
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.037 (1.957) *	0.305 (3.139) ***
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.001 (0.059)	-0.024 (-2.578) **
Unsystematic Risk* Liquidity (UNSYS*CR)	-0.174 (-1.038)	-0.096 (-0.361)
Unsystematic Risk* Firm Growth (UNSYS*g TA)	-0.006 (-0.148)	-0.008 (-0.132)
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.318 (-5.153)***	0.061 (0.537)
Unsystematic Risk* Leverage (UNSYS*LTDTA)	-0.047 (-0.864)	-0.083 (-1.649) ***
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.007 (-0.458)	-0.044 (-3.407) ***
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	-0.008 (-0.574)	-0.047 (-3.676) ***
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.036 (-0.604)	-0.027 (-0.465)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.037 (-1.41)	-0.014 (-0.749)
$\overline{R}^2$	59.64%	10.98%
N	12,292	6650
J-STATISTIC	33.36	33.97
SARGAN P-VALUE	0.3075	0.2407

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CR) is measured by current ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, CFPS, CR, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 3: Determinants of Dividend Payout Ratio, UK Firms Grouped by Firm Size, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	**Above Average MC**	**Below Average MC**
Constant	-0.008	0.0001
Profitability (NOPATTA)	-0.191 (-3.048)***	0.444 (14.052)***
Cash Flow(FCFTA)	-0.001 (-0.018)	0.049 (4.996)***
Liquidity(CR)	***-0.043*** ***(-0.792)***	***0.032*** ***(1.567)***
Earned Capital/Equity(REE)	-0.317 (-4.300)***	-0.645 (-19.342)***
Leverage (LTDTA)	0.161 (4.106)***	0.044 (1.157)
Firm Growth (gTA)	-0.022 (-0.838)	0.059 (5.628)***
Corporate Tax (TAX)	0.191 (11.466)***	0.245 (15.109)***
Institutional Ownership (ISOWN)	0.032 (0.795)	-0.059 (-2.291)**
Insider Ownership (INSIDE)	0.006 (0.227)	-0.030 (-0.999)
Firm Size (log TA)	0.116 (2.473)**	0.201 (6.738)***
Systematic Risk (SYS)	-0.061 (-2.186)**	-0.001 (-0.066)
Unsystematic Risk (UNSYS)	-0.202 (-3.274)***	-0.030 (-1.692)*
Systematic Risk* Profitability (SYS*NOPATTA)	0.151 (3.756)***	0.022 (1.102)
Systematic Risk* Cash Flow (SYS*FCFTA)	0.004 (0.366)	-0.013 (-1.021)
Systematic Risk* Liquidity (SYS*CR)	0.022 (0.862)	0.008 (0.679)
Systematic Risk* Firm Growth (SYS*g TA)	0.019 (1.574)	0.007 (0.749)
Systematic Risk* Earned Capital (SYS*REE)	-0.097	0.032

Variable	Above Average MC	Below Average MC
	(-2.405) **	(1.522)
Systematic Risk* Leverage (SYS*LTDTA)	-0.007 (-0.525)	0.007 (0.466)
Systematic Risk* Firm Size (SYS*log TA)	-0.010 (-0.836)	0.013 (1.148)
Systematic Risk* Corporate Taxation (SYS*TAX)	0.014 (1.354)	-0.008 (-0.649)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.018 (-1.086)	0.013 (0.679)
Systematic Risk*Insider Ownership (SYS*INSIDE)	0.007 (0.499)	-0.061 (-2.795) ***
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.584 (7.918) ***	0.064 (3.312) ***
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.021 (0.679)	-0.012 (-1.079)
Unsystematic Risk* Liquidity (UNSYS*CR)	-0.054 (-0.651)	0.086 (2.196) **
Unsystematic Risk* Firm Growth (UNSYS*g TA)	0.011 (0.507)	-0.011 (-1.033)
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.291 (-3.723)***	0.019 (0.966)
Unsystematic Risk* Leverage (UNSYS*LTDTA)	-0.125 (-3.685) ***	0.009 (0.551)
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.005 (-0.410)	0.038 (2.887) ***
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.001 (0.094)	-0.019 (-1.496)
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.027 (-0.615)	-0.022 (-1.432)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.005 (-0.281)	-0.040 (-1.548)
$\overline{R}^2$	36.32%	21.95%
N	5516	6179
J-STATISTIC	35.203	37.72
Sargan Test	0.2461	0.2243

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CR) is measured by current ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, CFPS, CR, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 4: Determinants of Dividend Payout Ratio, Firms Grouped by Sector, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014 classified by sector. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Industrial	Technology	Service	Utility	Other Industries
Constant	0.001	-0.002	-0.001	0.033	0.0004
Profitability (NOPATTA)	0.456 (18.141)***	0.538 (10.916) ***	0.564 (12.310) ***	-0.049 (-0.549)	0.710 (22.985) ***
Cash Flow(FCFTA)	0.064 (4.549)***	0.038 (1.574)	0.053 (2.026) **	-0.054 (-2.001)	0.066 (3.977) ***
Liquidity(CR)	***-0.109 (-7.539) ****	***-0.093 (-3.216) ****	***0.008 (0.316)***	***-0.005 (-0.046)***	***-0.065 (-3.942)****
Earned Capital/Equity(REE)	-0.628 (-24.502) ***	-0.486 (-9.406) ***	-0.709 (-15.453) ***	-0.427 (-5.266)***	-0.865 (-23.918) ***
Leverage (LTDTA)	0.014 (0.757)	-0.006 (-0.187)	0.009 (0.299)	0.374 (2.634) ***	0.018 (0.872)
Firm Growth (g TA)	-0.061 (-4.447) ***	-0.099 (-4.726) ***	0.005 (0.216)	0.053 (0.638)	-0.005 (-0.296)
Corporate Tax (TAX)	0.281 (18.355) ***	0.269 (9.252) ***	0.418 (15.689) ***	0.090 (1.289)	0.290 (16.427) ***
Institutional Ownership (ISOWN)	-0.046 (-2.321) **	-0.031 (-1.094)	-0.172 (-3.519) ***	0.553 (4.693) ***	-0.070 (-2.838) ***

Variable	Industrial	Technology	Service	Utility	Other Industries
Insider Ownership (INSIDE)	-0.043 (-1.958) *	-0.090 (-2.964) ***	-0.149 (-2.730) ***	-3.164 (-0.433)	-0.106 (-3.971) ***
Firm Size (log TA)	0.129 (6.438) ***	0.050 (1.536)	-0.041 (3.765) ***	-0.201 (-2.357) **	0.132 (5.917) ***
Systematic Risk (SYS)	-0.098 (-5.838) ***	0.002 (0.066)	-0.077 (-1.964) **	-0.291 (-0.332)	-0.043 (-2.039) **
Unsystematic Risk (UNSYS)	-0.141 (-7.566) ***	0.196 (2.528) **	-0.101 (-2.464) **	2.449 (0.228)	-0.128 (-5.621) ***
Systematic Risk* Profitability (SYS*NOPATTA)	-0.023 (-0.944)	-0.204 (-4.046) ***	-0.020 (-0.575)	-0.214 (-2.069) **	-0.024 (-0.914)
Systematic Risk* Cash Flow (SYS*FCFTA)	0.006 (0.378)	0.077 (2.758) ***	-0.022 (-0.727)	0.022 (0.083)	0.017 (0.902)
Systematic Risk* Liquidity (SYS*CR)	-0.007 (-0.454)	0.030 (1.201)	-0.046 (-1.739) *	-0.092 (-1.244)	-0.001 (-0.051)
Systematic Risk* Firm Growth (SYS*g TA)	-0.017 (-1.175)	-0.036 (-1.560)	-0.018 (-0.722)	-0.119 (-2.410) **	-0.013 (-0.776)
Systematic Risk* Earned Capital (SYS*REE)	0.083 (3.287) ***	0.178 (3.375) ***	0.035 (0.903)	0.245 (3.248) ***	0.059 (1.996) **
Systematic Risk* Leverage (SYS*LTDTA)	0.033 (1.742) *	0.061 (2.018) **	-0.033 (-0.872)	0.064 (0.806)	0.046 (2.175)**
Systematic Risk* Firm Size (SYS*log TA)	0.013 (0.772)	-0.039 (-1.529)	0.007 (0.308)	-0.189 (-2.747) ***	-0.019 (-0.956)
Systematic Risk* Corporate Tax (SYS*TAX)	0.029 (1.739) *	0.018 (0.762)	-0.014 (-0.529)	-0.158 (-1.415)	0.011 (0.608)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.026 (-1.632)	0.025 (0.802)	0.039 (1.111)	-0.009 (-0.086)	-0.033 (-1.735) *

Variable	Industrial	Technology	Service	Utility	Other Industries
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.008 (-0.361)	-0.073 (-2.139) **	-0.072 (-2.011) **	-32.885 (-0.356)	-0.039 (-2.006) **
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	-0.007 (-0.306)	-0.115 (-2.230) **	0.128 (3.492) ***	0.142 (1.309)	0.032 (1.149)
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.019 (1.216)	0.012 (0.535)	-0.077 (-2.431) **	-0.265 (-0.776)	0.028 (1.456)
Unsystematic Risk* Liquidity (UNSYS*CR)	0.023 (1.655) *	-0.010 (-0.377)	-0.034 (-1.530)	0.020 (0.205)	0.053 (3.365) ***
Unsystematic Risk* Firm Growth (UNSYS*g TA)	0.026 (1.819) *	-0.012 (-0.545)	-0.026 (-1.015)	-0.026 (-0.318)	0.016 (1.003)
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.154 (6.531) ***	0.032 (0.564)	0.023 (-1.015)	0.039 (0.588)	0.075 (2.474) **
Unsystematic Risk* Leverage (UNSYS*LTDTA)	0.020 (1.125)	-0.033 (-1.216)	0.012 (0.392)	0.019 (0.221)	0.011 (0.613)
Unsystematic Risk* Firm Size (UNSYS*log TA)	-0.006 (-0.392)	0.001 (0.027)	0.031 (1.586)	0.003 (0.036)	0.041 (2.567) **
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.069 (4.175) ***	0.036 (1.382)	0.012 (0.462)	-0.070 (-0.844)	0.038 (2.125) **
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.056 (-3.554) ***	0.049 (1.914) *	0.028 (0.757)	0.219 (1.948) *	-0.071 (-3.569) ***
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	0.018 (0.813)	0.002 (0.055)	0.042 (1.043)	2.309 (0.215)	-0.006 (-0.314)
$\bar{R}^2$	34.96%	26.17%	34.60%	17.87%	40.79%
N	4803	1395	1378	267	3390
J-STATISTIC	36.95	36.92	36.81	35.077	37.22
SARGAN P-VALUE	0.2135	0.2140	0.2178	0.2389	0.2413

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CR) is measured by current ratio. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (LTDTA) is the ratio of long-term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CR, gTA, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Appendix 5-3: Determinants of Dividend Payout Ratio – Leverage measured by Debt to Equity (DE)

Table 1: Determinants of Dividend Payout Ratio, UK Non-financial Firms, Entire Sample, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Coefficient
Constant	-0.002
Profitability (NOPATTA)	0.581 (27.309) ***
Cash Flow(FCFTA)	0.092 (11.3430***
Liquidity(CASHTA)	0.018 (1.442) ***
Earned Capital/Equity(REE)	-0.729 (-29.381) ***
Leverage (DE)	***0.102*** ***(5.854) ******
Firm Growth (g TA)	3.733 (1.193)
Corporate Tax (TAX)	0.312 (28.298) ***
Institutional Ownership (ISOWN)	-0.024 (-0.440)
Insider Ownership (INSIDE)	-0.067 (-3.498) ***
Firm Size (log TA)	0.117 (4.100) ***
Systematic Risk (SYS)	-0.040 (-3.375) ***
Unsystematic Risk (UNSYS)	-0.119 (-12.244) ***
Systematic Risk* Profitability (SYS*NOPATTA)	-0.039 (-1.539)
Systematic Risk* Cash Flow (SYS*FCFTA)	0.003 (0.262)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.005

Variable	Coefficient
	(-0.292)
Systematic Risk* Firm Growth (SYS*gTA)	-0.008 (-0.860)
Systematic Risk* Earned Capital (SYS*REE)	0.076 (3.522) ***
Systematic Risk* Leverage (SYS*DE)	0.072 (1.057)
Systematic Risk* Firm Size (SYS*log TA)	-0.026 (-1.214)
Systematic Risk* Corporate Taxation (SYS*TAX)	0.003 (0.283)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.009 (-0.572)
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.026 (-1.704) *
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	-0.078 (-4.274) ***
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.008 (0.830)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.036 (-3.479) ***
Unsystematic Risk* Firm Growth (UNSYS*gTA)	-0.008 (-0.808)
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.207 (10.541)***
Unsystematic Risk* Leverage (UNSYS*DE)	-0.065 (-2.445) **
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.009 (0.807)
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.012 (0.782)
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.018 (-0.774)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.038 (-2.516) **
$\overline{R}^2$	37.71%
N	12,292
J-STATISTIC	31.38
SARGAN P-VALUE	0.3475

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CASHTA) is measured by the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, gTA, REE, DE, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 2: Determinants of Dividend Payout Ratio, UK Firms Grouped by Dividend Payout Ratio, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio versus dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Above Average DPR	Below Average DPR
Constant	-0.004	0.001
Profitability (NOPATTA)	-0.087 (-2.034)**	0.147 (1.984)**
Cash Flow(FCFTA)	0.048 (4.672)***	0.021 (2.226)**
Liquidity(CASHTA)	1.109 (3.276)***	-1.006 (-1.446)
Earned Capital/Equity(REE)	-0.640 (-8.159)***	-0.438 (-4.429)***
Leverage (DE)	***0.083 (3.126)****	***-0.001 (-0.059)***
Firm Growth (g TA)	0.025 (0.518)	-0.015 (-0.223)
Corporate Tax (TAX)	0.036 (1.960)*	0.159 (10.005)***
Institutional Ownership (ISOWN)	-0.013 (-0.215)	0.011 (0.184)
Insider Ownership (INSIDE)	-0.009 (-0.197)	-0.083 (-2.148)**
Firm Size (log TA)	0.085 (1.859)*	0.088 (1.275)
Systematic Risk (SYS)	0.086 (2.569)***	-0.109 (-2.313)**
Unsystematic Risk (UNSYS)	0.578 (3.945)***	-0.639 (-2.284)**
Systematic Risk* Profitability (SYS*NOPATTA)	0.026 (1.526)	-0.245 (-3.456)***
Systematic Risk* Cash Flow (SYS*FCFTA)	0.034 (2.764)***	0.004 (0.445)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.094 (-2.065)**	0.069 (1.056)
Systematic Risk* Firm Growth (SYS*gTA)	-0.003 (-0.182)	0.018 (1.027)
Systematic Risk* Earned Capital (SYS*REE)	-0.012 (-0.430)	0.306 (4.367)***

Variable	Above Average DPR	Below Average DPR
Systematic Risk* Leverage (SYS*DE)	-0.009 (-0.637)	0.100 (1.441)
Systematic Risk* Firm Size (SYS*log TA)	-0.003 (-0.204)	-0.028 (-1.782) *
Systematic Risk* Corporate Taxation (SYS*TAX)	0.016 (1.235)	-0.024 (-3.861) ***
Systematic Risk*Institutional Ownership (SYS*ISOWN)	0.006 (0.256)	-0.059 (-1.983) **
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.049 (-2.037) **	0.006 (0.515)
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.056 (2.715) ***	0.323 (3.543) ***
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	-0.007 (-0.501)	-0.013 (-1.149)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-1.112 (-3.189) ***	1.079 (1.466)
Unsystematic Risk* Firm Growth (UNSYS*gTA)	0.001 (0.030)	-0.003 (-0.044)
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.257 (-3.949) ***	0.018 (0.167)
Unsystematic Risk* Leverage (UNSYS*DE)	-0.021 (-1.078)	0.025 (0.899)
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.009 (0.555)	-0.021 (-1.097)
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	-0.005 (-0.359)	-0.054 (-3.540) ***
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.029 (-0.483)	-0.056 (-0.966)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.0001 (-0.026)	-0.023 (-1.136)
$\overline{R}^2$	58.42%	5.37%
N	12,292	6650
J-STATISTIC	33.47	33.35
SARGAN P-VALUE	0.3483	0.2638

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CASHTA) is measured by the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, gTA, REE, DE, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 3: Determinants of Dividend Payout Ratio, UK Firms Grouped by Firm Size, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio against dividend policy determinants for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	**Above Average MC**	**Below Average MC**
Constant	-0.005	-0.001
Profitability (NOPATTA)	-0.153 (-1.849)*	0.468 (10.273)***
Cash Flow(FCFTA)	-0.013 (-0.259)	0.026 (1.823) *
Liquidity(CASHTA)	0.123 (0.624)	0.012 (0.517)
Earned Capital/Equity(REE)	-0.369 (-3.119)***	-0.644 (-13.649) ***
Leverage (DE)	***0.129 (3.591) ****	***0.093 (1.159)***
Firm Growth (g TA)	-0.033 (-0.815)	0.051 (3.203) ***
Corporate Tax (TAX)	0.169 (3.478) ***	0.234 (12.566) ***
Institutional Ownership (ISOWN)	0.219 (0.512)	-0.059 (-2.129) **
Insider Ownership (INSIDE)	-0.065 (-0.826)	-0.039 (-1.170) ***
Firm Size (log TA)	0.048 (0.827)	0.149 (3.736) ***
Systematic Risk (SYS)	-0.043 (-1.000)	0.056 (1.457)
Unsystematic Risk (UNSYS)	-0.178 (-1.111)	0.155 (1.776)*
Systematic Risk* Profitability (SYS*NOPATTA)	0.175 (3.162) ***	0.033 (1.362)
Systematic Risk* Cash Flow (SYS*FCFTA)	0.003 (0.206)	0.068 (1.714) *
Systematic Risk* Liquidity (SYS*CASHTA)	-0.128 (-1.135)	0.023 (1.377)
Systematic Risk* Firm Growth (SYS*gTA)	-0.002 (-0.102)	0.056 (0.804)
Systematic Risk* Earned Capital (SYS*REE)	-0.065 (-1.001)	-0.015 (-0.468)

Variable	Above Average MC	Below Average MC
Systematic Risk* Leverage (SYS*DE)	-0.012 (-0.568)	-0.006 (-0.422)
Systematic Risk* Firm Size (SYS*log TA)	0.051 (1.111)	0.004 (0.239)
Systematic Risk* Corporate Taxation (SYS*TAX)	-0.051 (-0.405)	0.0002 (0.021)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	0.033 (0.132)	0.007 (0.308)
Systematic Risk*Insider Ownership (SYS*INSIDE)	0.342 (1.261)	-0.052 (-2.194) **
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.510 (5.044) ***	-0.052 (-1.259)
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.025 (0.523)	0.314 (2.192) **
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.097 (-0.537)	-0.006 (-0.241)
Unsystematic Risk* Firm Growth (UNSYS*gTA)	0.032 (0.801)	0.063 (2.198) **
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.262 (-2.335) **	0.060 (2.083) **
Unsystematic Risk* Leverage (UNSYS*DE)	-0.079 (-3.503) ***	-0.172 (-3.105) ***
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.064 (1.464)	0.058 (2.526) **
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.046 (0.413)	-0.028 (-1.768) *
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.318 (-0.623)	-0.022 (1.215)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	0.296 (1.252)	-0.033 (-1.183)
$\overline{R}^2$	15.47%	3.783%
N	12,292	6179
J-STATISTIC	26.83	38.15
SARGAN P-VALUE	0.3130	0.2099

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CASHTA) is measured by the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, gTA, REE, DE, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 4: Determinants of Dividend Payout Ratio, Firms Grouped by Sector, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio against dividend policy determinants, for 1340 UK firms in the period 1991-2014 classified by sector. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Industrial	Technology	Service	Utility	Other Industries
Constant	0.003	-0.0003	-0.002	0.004	0.0007
Profitability (NOPATTA)	0.455 (18.500)***	0.504 (6.561)***	0.582 (12.544)***	0.176 (1.007)	0.719 (15.318)***
Cash Flow(FCFTA)	0.082 (6.004)***	-0.057 (-1.728)*	0.027 (1.041)	-0.117 (-0.436)	0.059 (3.372)***
Liquidity(CASHTA)	-0.022 (-1.558)	-0.057 (-1.728)*	-0.149 (-6.313)***	-0.154 (-3.572)***	0.014 (0.669)
Earned Capital/Equity(REE)	-0.621 (-24.289)***	-0.450 (-5.698)***	-0.692 (-14.661)***	-0.345 (-2.976)***	-0.878 (-20.816)***
Leverage (DE)	***0.119 (7.319)****	***0.016 (0.202)***	***-0.025 (-0.932)***	***0.348 (2.122)*** **	***0.101 (2.178)*** **
Firm Growth (g TA)	-0.064 (-4.694)***	-0.103 (-4.806)***	0.006 (0.238)	0.145 (2.127)**	-0.010 (-0.626)
Corporate Tax (TAX)	0.287 (18.787)***	0.272 (9.023)***	0.432 (16.616)***	0.072 (1.056)	0.299 (16.059)***
Institutional Ownership (ISOWN)	-0.037 (-1.850)*	-0.102 (-0.329)	-0.163 (-3.547)***	0.226 (1.362)	-0.084 (-3.384)***
Insider Ownership (INSIDE)	-0.035 (-1.589)	-0.075 (-2.302)**	-0.138 (-2.691)***	-13.668 (-1.881)*	-0.107 (-3.857)***

Variable	Industrial	Technology	Service	Utility	Other Industries
Firm Size (Log TA)	0.093 (4.449) ***	0.045 (1.062)	-0.007 (-0.239)	-0.454 (-5.705) ***	0.082 (2.420) **
Systematic Risk (SYS)	-0.098 (-5.610) ***	0.033 (1.019)	-0.039 (-1.028)	-1.630 (-1.889) *	-0.049 (-2.170) **
Unsystematic Risk (UNSYS)	-0.148 (-7.889) ***	0.221 (1.000)	-0.078 (-1.923) *	18.422 (1.683) *	-0.142 (5.465) ***
Systematic Risk* Profitability (SYS*NOPATTA)	-0.029 (-1.224)	-0.171 (-3.015) ***	-0.029 (-0.814)	-0.011 (-0.106)	0.022 (0.469)
Systematic Risk* Cash Flow (SYS*FCFTA)	0.012 (0.826)	0.089 (3.056) ***	0.003 (0.117)	-0.096 (-0.348)	0.006 (0.313)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.026 (-1.724) *	-0.002 (-0.017)	0.325 (1.387)	-0.167 (-2.759) ***	0.027 (0.696)
Systematic Risk* Firm Growth (SYS*gTA)	-0.013 (-0.954)	-0.031 (-1.252)	-0.009 (-0.390)	-0.134 (-3.191) ***	-0.033 (-0.310)
Systematic Risk* Earned Capital (SYS*REE)	0.086 (3.372) ***	0.149 (2.769) ***	0.019 (0.493)	0.409 (5.540) ***	0.027 (0.752)
Systematic Risk* Leverage (SYS*DE)	-0.003 (-0.209)	0.004 (0.097)	0.005 (0.177)	0.517 (2.272) **	0.139 (1.741) *
Systematic Risk* Firm Size (SYS*log TA)	0.018 (1.130) *	-0.042 (-1.053)	0.034 (1.458)	-0.189 (-2.520) **	-0.062 (-1.576)
Systematic Risk* Corporate Taxation (SYS*TAX)	0.027 (1.662) *	0.022 (0.861)	-0.029 (-1.099)	-0.137 (-1.367)	0.009 (0.472)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.031 (-1.932) *	0.027 (0.767)	0.015 (0.447)	-0.331 (-2.056) **	-0.001 (-0.049)
Systematic Risk*Insider Ownership (SYS*INSIDE)	0.003 (0.115)	-0.064 (-1867) *	-0.054 (-1.546)	-167.246 (-1.812) *	-0.044 (-1.917) *
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	-0.019 (-0.871)	-0.134 (-0.951)	0.104 (2.863) ***	0.164 (1.143)	0.024 (0.764)

Variable	Industrial	Technology	Service	Utility	Other Industries
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.015 (0.3998)	0.007 (0.294)	-0.059 (-1.916) *	-0.302 (-0.965)	0.008 (0.385)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.035 (-2.374) **	-0.008 (-0.219)	-0.011 (-0.467)	-0.061 (-1.487)	0.019 (0.843)
Unsystematic Risk* Firm Growth (UNSYS*gTA)	0.033 (2.325) **	-0.017 (-0.719)	-0.025 (-0.959)	0.048 (0.674)	-0.027 (-0.663)
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.162 (7.074) ***	0.040 (0.547)	0.032 (0.831)	0.218 (2.514) **	0.089 (3.036) ***
Unsystematic Risk* Leverage (UNSYS*DE)	-0.062 (-4.131) ***	-0.031 (-0.244)	-0.025 (-0.889)	0.403 (2.456) **	-0.023 (-0.586)
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.016 (1.065)	-0.019 (-0.506)	0.062 (3.113) ***	-0.088 (-1.048)	0.044 (1.933) *
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.064 (3.876) ***	0.031 (0.852)	-0.032 (-1.150)	-0.096 (-1.192)	0.026 (1.443)
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.061 (-3.869) ***	0.051 (1.694) *	0.011 (0.292)	-0.169 (-1.164)	-0.083 (-4.232) ***
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	0.013 (0.567)	0.006 (0.146)	0.057 (1.445)	18.607 (1.698) *	-0.005 (-0.243)
$\overline{R}^2$	35.26%	25.37%	36.87%	36.58%	41.44%
N	4803	1395	1378	267	3390
J-STATISTIC	35.37	36.43	35.45	35.84	37.06
SARGAN P-VALUE	0.2698	0.2307	0.2667	0.2137	0.2469

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CASHTA) is measured by the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth is the growth of total assets (g TA). Leverage (DE) is the ratio of total debt to shareholders' equity. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, gTA, REE, DE, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Appendix 5-4: Determinants of Dividend Payout Ratio with Firm Growth Measured by Market-to-Book Ratio (MB)

Table 1: Determinants of Dividend Payout Ratio, UK Non-financial Firms, Entire Sample, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio against dividend policy determinants, for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Coefficient
Constant	0.0001
Profitability (NOPATTA)	0.496 (34.354)***
Cash Flow (FCFTA)	0.083 (10.906)***
Liquidity(CASHTA)	-0.030 (-3.681)***
Earned Capital/Equity(REE)	-0.732 (-49.369)***
Leverage (LTDTA)	0.038 (3.548)***
Firm Growth (MB)	***0.198*** ***(22.065)*** ***
Corporate Tax (TAX)	0.294 (30.610)***
Institutional Ownership (ISOWN)	-0.049 (-4.081)***
Insider Ownership (INSIDE)	-0.057 (-4.146)***
Firm Size (log TA)	0.159 (16.773)***
Systematic Risk (SYS)	-0.038 (-4.369)***
Unsystematic Risk (UNSYS)	-0.112 (-11.754)***
Systematic Risk* Profitability (SYS*NOPATTA)	-0.047 (-2.939)***
Systematic Risk* Cash Flow (SYS*FCFTA)	0.015 (1.709)*
Systematic Risk* Liquidity (SYS*CASHTA)	-0.022 (-2.547)**
Systematic Risk* Firm Growth (SYS*MB)	-0.038 (-4.275)***

Variable	Coefficient
Systematic Risk* Earned Capital (SYS*REE)	0.096 (5.491) ***
Systematic Risk* Leverage (SYS*LTDTA)	0.026 (2.446) **
Systematic Risk* Firm Size (SYS*log TA)	-0.014 (-1.418)
Systematic Risk* Corporate Taxation (SYS*TAX)	-0.002 (-0.232)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.011 (-0.927)
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.039 (-2.740) ***
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.002 (0.122)
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.016 (1.909) *
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.016 (-1.739) *
Unsystematic Risk* Firm Growth (UNSYS*MB)	-0.083 (-9.594) ***
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.178 (9.985) ***
Unsystematic Risk* Leverage (UNSYS*LTDTA)	0.012 (1.123)
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.001 (0.103)
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.029 (2.760) ***
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	0.0002 (0.014)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.029 (-1.992) **
$\overline{R}^2$	40.66%
N	12,292
J-STATISTIC	24.99
SARGAN P-VALUE	0.2480

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CASHTA) is measured by the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth (MB) is the market-to-book ratio. Leverage (LTDTA) is the ratio of long total debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, MB, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 2: Determinants of Dividend Payout Ratio, UK Firms Grouped by Dividend Payout Ratio, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio against dividend policy determinants, for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	**Above Average DPR**	**Below Average DPR**
Coefficient	0.002	-0.001
Profitability (NOPATTA)	-0.078 (-0.548)	0.178 (2.094) **
Cash Flow(FCFTA)	0.042 (4.118)***	0.016 (1.393)
Liquidity(CASHTA)	0.899 (2.827)***	-1.372 (-1.550)
Earned Capital/Equity(REE)	-0.693 (-7.750) ***	-0.506 (-4.497) ***
Leverage (LTDTA)	0.083 (1.277)	0.112 (1.537)
Firm Growth (MB)	***0.232*** ***(0.789)***	***0.171*** ***(0.251)***
Corporate Tax (TAX)	0.069 (3.371) ***	0.165 (9.692) ***
Institutional Ownership (ISOWN)	0.023 (0.369)	-0.001 (-0.009)
Insider Ownership (INSIDE)	-0.115 (-0.256)	-0.086 (-2.035) **
Firm Size (log TA)	0.117 (2.606) ***	0.073 (0.978)
Systematic Risk (SYS)	-0.078 (-0.549)	-0.184 (-2.151) **
Unsystematic Risk (UNSYS)	0.744 (2.451) **	-0.717 (-1.336)

Variable	**Above Average DPR**	**Below Average DPR**
Systematic Risk* Profitability (SYS*NOPATTA)	-0.015 (-0.454)	-0.203 (-2.426) **
Systematic Risk* Cash Flow (SYS*FCFTA)	0.033 (2.802) ***	0.005 (0.471)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.179 (-2.311) **	0.103 (0.929)
Systematic Risk* Firm Growth (SYS*MB)	0.341 (1.219)	0.131 (0.717)
Systematic Risk* Earned Capital (SYS*REE)	-0.046 (-1.024)	0.261 (2.755) ***
Systematic Risk* Leverage (SYS*LTDTA)	0.025 (0.905)	-0.030 (-1.287)
Systematic Risk* Firm Size (SYS*log TA)	-0.002 (-0.142)	-0.008 (-0.319)
Systematic Risk* Corporate Taxation (SYS*TAX)	-0.004 (-0.197)	-0.039 (-2.729) ***
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.031 (-1.033)	-0.040 (-1.748) *
Systematic Risk*Insider Ownership (SYS*INSIDE)	-0.031 (-1.222)	0.012 (0.596)
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.049 (2.463) **	0.268 (2.608) ***
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	-0.004 (-0.291)	-0.005 (-0.362)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.867 (-2.638) ***	1.452 (1.559)
Unsystematic Risk* Firm Growth (UNSYS*MB)	-0.272 (-0.852)	-0.121 (-0.154)
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.293 (-4.504) ***	0.089 (0.679)
Unsystematic Risk* Leverage (UNSYS*LTDTA)	-0.057 (-1.017)	-0.038 (0.679)
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.029 (1.417)	-0.001 (-0.029)
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	-0.005 (-0.347)	-0.059 (-3.194) ***
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.056 (-0.907)	-0.086 (-1.100)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	-0.001 (-0.038)	-0.030 (-1.264)
$\overline{R}^2$	59.34%	1.56%
N	12,292	6650
J-STATISTIC	35.18	33.16
SARGAN P-VALUE	0.2365	0.2713

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CASHTA) is measured by the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth (MB) is the market-to-book ratio. Leverage (LTDTA) is the ratio of long total debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, MB, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 3: Determinants of Dividend Payout Ratio, UK Firms Grouped by Dividend Payout Ratio, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio against dividend policy determinants, for 1340 UK firms in the period 1991-2014. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	Above Average MC	Below Average MC
Coefficient	-0.008	0.001
Profitability (NOPATTA)	-0.229 (-3.274)***	0.432 (13.421)***
Cash Flow(FCFTA)	-0.028 (-0.809)	0.033 (3.372)***
Liquidity(CASHTA)	-0.013 (-0.118)	-0.002 (-0.109)
Earned Capital/Equity(REE)	-0.354 (-4.752) ***	-0.671 (-18.501) ***
Leverage (LTDTA)	0.114 (2.456) **	0.043 (1.126)
Firm Growth (MB)	***0.807 (1.279)***	***0.192 (7.069)****
Corporate Tax (TAX)	0.197 (11.401) ***	0.233 (14.036) ***
Institutional Ownership (ISOWN)	0.012 (0.249)	-0.078 (-2.989) ***
Insider Ownership (INSIDE)	-0.008 (-0.306)	-0.020 (-0.654)
Firm Size (log TA)	0.161 (3.218) ***	0.255 (8.968) ***
Systematic Risk (SYS)	-0.015 (-0.181)	-0.007 (-0.399)
Unsystematic Risk (UNSYS)	0.170 (0.413)	-0.044 (-1.028)
Systematic Risk* Profitability (SYS*NOPATTA)	0.139 (3.592) ***	0.035 (1.719) *
Systematic Risk* Cash Flow (SYS*FCFTA)	-0.0004 (-0.027)	-0.024 (-1.087)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.053 (-0.756)	-0.006 (-0.486)
Systematic Risk* Firm Growth (SYS*MB)	0.041 (0.205)	-0.023 (-1.078)
Systematic Risk* Earned Capital (SYS*REE)	-0.086 (-1.910) *	0.027 (1.222)

Variable	Above Average MC	Below Average MC
Systematic Risk* Leverage (SYS*LTDTA)	-0.007 (-0.262)	0.009 (0.573)
Systematic Risk* Firm Size (SYS*log TA)	-0.0002 (-0.012)	0.026 (2.168) **
Systematic Risk* Corporate Taxation (SYS*TAX)	0.009 (0.820)	-0.003 (-0.249)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.013 (-0.688)	0.023 (1.210)
Systematic Risk*Insider Ownership (SYS*INSIDE)	0.014 (0.821)	-0.065 (-3.051) ***
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	0.597 (7.320) ***	0.094 (3.242) ***
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.047 (1.493)	-0.054 (-0.742)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.014 (-0.131)	0.009 (0.701)
Unsystematic Risk* Firm Growth (UNSYS*MB)	-0.665 (-0.932)	-0.136 (-2.639)
Unsystematic Risk* Earned Capital (UNSYS*REE)	-0.276 (-3.513) ***	0.056 (2.382) **
Unsystematic Risk* Leverage (UNSYS*LTDTA)	-0.102 (-2.555) **	-0.005 (-0.299) **
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.027 (0.876)	0.018 (1.219)
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.006 (0.473)	0.003 (0.212)
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.021 (-0.433)	-0.002 (-0.149)
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	0.006 (0.292)	-0.032 (-1.289)
$\overline{R}^2$	32.71%	21.28%
N	12,292	6179
J-STATISTIC	35.27	37.33
SARGAN P-VALUE	0.2333	0.2373

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash Flow (FCFTA) is measured by free cash flow to total assets. Liquidity (CASHTA) is measured by the ratio of cash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders' equity. Firm Growth (MB) is the market-to-book ratio. Leverage (LTDTA) is the ratio of long total debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and major shareholders. Firm Size (log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of the stock return minus the stock systematic risk.SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, MB, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression.

Table 4: Determinants of Dividend Payout Ratio, Firms Grouped by Sector, Risk Interaction Variables

This table presents GMM-in-system regression results for the dividend payout ratio against dividend policy determinants, for 1340 UK firms in the period 1991-2014 classified by sector. Outliers outside of 3 standard deviations are detected and excluded. The t-statistics are shown in brackets. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Standard errors are robust to heteroscedasticity. Variables are expressed in first differences in a linear system of first-differenced and level equations. The Sargan test is a test of over-identifying restrictions asymptotically distributed as chi-square. The J-statistic is an asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions.

Variable	**Industrial**	**Technology**	**Service**	**Utility**	**Other Industries**
Coefficient	-0.00001	0.005	-0.004	-0.007	-0.003
Profitability (NOPATTA)	0.422 (13.591)***	0.559 (11.441)***	0.583 (12.906)***	0.161 (2.671)***	0.640 (21.546)***
Cash Flow(FCFTA)	0.095 (6.617)***	0.061 (2.659)***	0.030 (1.239)	-0.177 (-2.752)***	0.052 (3.305)***
Liquidity(CASHTA)	-0.065 (-4.021)***	-0.069 (-2.758)***	-0.153 (-6.805)***	-0.146 (-4.457)***	-0.887 (-26.539)***
Earned Capital/Equity(REE)	-0.658 (-23.861)***	-0.540 (-10.053)***	-0.691 (-13.790)***	-0.454 (-6.309)***	-0.886 (-26.539)***
Leverage (LTDTA)	0.097 (4.117)***	0.041 (1.112)	-0.024 (-0.819)	0.225 (2.541)**	0.052 (2.632)***
Firm Growth (MB)	***0.202 (11.695)****	***-0.102 (-2.682)****	***0.027 (0.781)***	***0.402 (7.259)****	***0.263 (13.854)****
Corporate Tax (TAX)	0.268 (15.969)***	0.285 (10.005)***	0.428 (16.654)***	0.036 (0.675)	0.281 (16.190)***
Institutional Ownership (ISOWN)	-0.047 (-2.180)**	-0.009 (-0.298)	-0.142 (-3.046)***	0.396 (4.803)***	-0.086 (-3.451)***
Insider Ownership (INSIDE)	-0.043 (-1.811)*	-0.060 (-1.808)*	-0.153 (-2.999)***	-7.736 (-1.984)**	-0.114 (-4.389)***

Variable	Industrial	Technology	Service	Utility	Other Industries
Firm Size (log TA)	0.189 (6.735) ***	0.076 (1.998) **	-0.0003 (-0.008)	-0.235 (-2.835) ***	0.232 (10.2810***
Systematic Risk (SYS)	-0.106 (-4.075) ***	0.002 (0.069)	-0.032 (-0.973)	-0.983 (-2.167) **	-0.052 (-2.511) **
Unsystematic Risk (UNSYS)	-0.094 (-3.167) ***	0.305 (4.143)***	-0.059 (-1.599)	10.339 (1.802) *	-0.121 (-5.472) ***
Systematic Risk* Profitability (SYS*NOPATTA)	-0.029 (-1.012)	-0.153 (-3.098) ***	-0.037 (-1.079)	0.039 (0.549)	-0.023 (-0.841)
Systematic Risk* Cash Flow (SYS*FCFTA)	-0.004 (-0.147)	0.083 (3.076) ***	0.012 (0.443)	0.037 (0.518)	0.013 (0.717)
Systematic Risk* Liquidity (SYS*CASHTA)	-0.013 (-0.404)	0.009 (0.354)	0.024 (1.089)	-0.048 (-1.131)	-0.026 (-1.398)
Systematic Risk* Firm Growth (SYS*MB)	-0.135 (-0.865)	-0.113 (-0.917)	0.005 (0.212)	-0.234 (-5.509) ***	-0.009 (-0.547)
Systematic Risk* Earned Capital (SYS*REE)	0.089 (3.151) ***	0.179 (2.987) ***	0.023 (0.601)	0.379 (5.723) ***	0.082 (2.899) ***
Systematic Risk* Leverage (SYS*LTDTA)	0.022 (0.262)	0.060 (1.775) *	-0.016 (-0.438)	0.202 (3.375) ***	0.041 (1.969) **
Systematic Risk* Firm Size (SYS*log TA)	0.049 (1.525)	-0.093 (-1.946) *	0.032 (1.332)	-0.074 (-1.523)	-0.018 (-0.919)
Systematic Risk* Corporate Taxation (SYS*TAX)	0.033 (1.860) *	0.036 (1.493)	-0.025 (-0.983)	0.077 (1.316)	0.011 (0.574)
Systematic Risk*Institutional Ownership (SYS*ISOWN)	-0.018 (-0.685)	0.042 (1.228)	0.012 (0.347)	0.020 (0.349)	-0.034 (-1.815) *
Systematic Risk*Insider Ownership (SYS*INSIDE)	0.001 (0.029)	-0.105 (-2.474) **	-0.053 (-1.543)	-94.188 (-1.911) *	-0.039 (-1.979) **
Unsystematic Risk* Profitability (UNSYS*NOPATTA)	-0.021 (-0.759)	-0.156 (-3.039) ***	0.116 (3.533) ***	0.077 (1.173)	0.082 (2.816) ***

Variable	Industrial	Technology	Service	Utility	Other Industries
Unsystematic Risk* Cash Flow (UNSYS*FCFTA)	0.065 (2.489) **	0.004 (0.166)	-0.056 (-1.931) *	-0.201 (-2.183) **	0.013 (0.718)
Unsystematic Risk* Liquidity (UNSYS*CASHTA)	-0.064 (-2.752) ***	-0.023 (-0.885)	-0.089 (-0.386)	-0.004 (-0.118)	0.015 (0.873)
Unsystematic Risk* Firm Growth (UNSYS*MB)	0.210 (1.973) **	-0.073 (-2.917) ***	0.019 (0.937)	0.198 (3.364) ***	-0.054 (-3.357)
Unsystematic Risk* Earned Capital (UNSYS*REE)	0.164 (6.264) ***	-0.003 (-0.058)	0.006 (0.154)	0.270 (5.125) ***	0.067 (2.296) **
Unsystematic Risk* Leverage (UNSYS*LTDTA)	-0.137 (-2.107) **	-0.039 (-1.371)	0.016 (0.495)	0.152 (2.922) ***	0.015 (0.876)
Unsystematic Risk* Firm Size (UNSYS*log TA)	0.003 (0.094)	-0.020 (-0.765)	0.059 (2.979) ***	0.066 (1.521)	0.057 (3.494) ***
Unsystematic Risk* Corporate Taxation (UNSYS*TAX)	0.071 (3.861) ***	0.032 (1.767)	-0.0005 (-0.019)	-0.003 (-0.054)	0.048 (2.697) ***
Unsystematic Risk*Institutional Ownership (UNSYS*ISOWN)	-0.062 (-2.959) ***	0.052 (2.037) **	0.017 (0.459)	0.135 (2.018) **	-0.069 (-3.519) ***
Unsystematic Risk*Insider Ownership (UNSYS*INSIDE)	0.004 (0.139)	0.010 (0.258)	0.061 (1.529)	10.419 (1.089) *	-0.003 (-0.163)
$\overline{R}^2$	29.58%	24.37%	36.85%	54.17%	44.56%
N	4803	1395	1378	267	3390
J-STATISTIC	36.50	35.194	37.04	34.46	36.67
SARGAN P-VALUE	0.2281	0.2763	0.2105	0.2628	0.2611

The dependent variable is the dividend payout ratio. Profitability (NOPATTA) is measured by net operating profit after tax divided by total assets. Cash flow (FCF) is measured by free cash flow to total assets. Liquidity (CASHTA) is measured by the ratio ofcash to total assets. Earned Capital/Equity (REE) is the ratio of retained earnings to stockholders equity. Firm Growth (MB) is measured by the ratio of market to book. Leverage (LTDTA) is the ratio of long term debt to total assets. Corporate Tax (TAX) is the effective corporate tax rate. Institutional Ownership (ISOWN) is the percentage of firms owned by institutional investors. Insider Ownership (INSIDE) is the percentage of firms owned by Insiders and those with substantial position in the company. Firm Size (Log TA) is measured by the natural log of total assets. Systematic Risk (SYS) is the stock systematic risk measured as the beta of the stock multiplied by the standard deviation of the market return. Unsystematic risk (UNSYS) is the stock unsystematic risk measured as the standard deviation of stock return minus the stock systematic risk. SYS*X and UNSYS*X are interaction variables between SYS or UNSYS and each variable X respectively (where X is NOPATTA, FCFTA, CASHTA, MB, REE, LTDTA, log TA, TAX, ISOWN and INSIDE). A dummy variable for Time is used in the regression. A dummy Variable for Time is used in the regression.

CHAPTER 6

SUMMARY AND CONCLUSIONS

This thesis primarily aims to contribute to the literature on corporate dividend decisions by offering a study of the determinants of the dividend payout ratio in the UK. The empirical study incorporates a wide set of dividend policy determinants and offers new insights into the relationship between the dividend payout ratio and firm risks. The study also provides coverage of a number of dividend theories, including the life cycle theory, agency theory, and the free cash flow hypothesis, and sheds light on the transaction cost, residual, and signalling theories. The interrelationships between firm risks and the dividend theories are examined through the introduction of risk interaction variables measuring the potential interactions between determinants of the dividend payout ratio and each of systematic and unsystematic risk.

In addition, the researcher examines the impact of the global financial crisis on the dividend policies of UK firms. This impact is likely to result from the escalation in firm risk due to shocks to the supply of credit and the subsequent increase in the cost of external financing. An alternative explanation of the effect of the crisis on the dividend payout ratio relates to the possible shrinkage in firms' investment opportunities, caused by a demand shock. Given these two types of shock, the dividend payout ratio is likely to be a function of the abundance of internal cash flows and the severity of agency-related problems.

The sample consists of all UK non-financial firms with a minimum of five years of observations over a twenty-four year period from 1991 to 2014. The study covers both listed and de-listed companies to avoid survivorship bias. The final sample includes 1340 firms and 12296 firm-year observations. The dynamic nature of panel data necessitates the use of an instrumental variable method, namely the GMM

The results strongly confirm the role of systematic and unsystematic risks in shaping the dividend payout ratios of firms in the UK. Although systematic risk has been examined more often than unsystematic risk as a determinant of dividend policy in the UK, in the results of this thesis the coefficients of the former appear consistently larger and more significant than those of the latter. Both systematic and unsystematic risks appear to interact significantly with the determinants of the dividend payout ratio. In some cases, the two types of risk appear to moderate the impact of some of the dividend policy determinants. For instance, they moderate the effect of profitability in both the entire sample and for technology firms. Meanwhile, unsystematic risk moderates the impact of both leverage and firm size on the dividend payout ratio for large-sized firms. On the other hand, the interaction effect between liquidity and determinants of the dividend payout ratio persistently proves the tendency of UK firms to preserve their cash holdings, and provides further support to the flexibility hypothesis. The interplay between each of systematic and unsystematic risk and the two proxies for agency theory (institutional and insider ownership) provides further support for the role of institutions and insiders as dividend substitutes minimizing agency-related problems. The interaction between the firm risks and firm growth appears to have limited impact on the dividend payout ratio. This provides further support for the limited role of the lifecycle and residual theories in shaping the dividend policies of firms, across all groupings except for the technology sector.

The impact of the global financial crisis per se on the dividend payout ratios of UK firms appears confined to the industrial and utilities sectors, whose firms appear to have reduced their payout ratios during the crisis period. The results of the interaction between the crisis dummy variable and determinants of the payout ratio provide support to the argument concerning the demand shock caused by the crisis. In this respect, companies with excess free cash flows and of a large size appear to have increased their payout ratios to minimize agency-related problems and signal a stable financial condition. The above result appears relevant in the case of utility companies that due to regulation appear to pay out a high percentage of their earnings to force themselves to seek external capital as a means of monitoring and a substitute for insider control mechanisms. On the contrary, the impact of the credit supply shock materializes for companies with high payout ratios and for technology firms. In this scenario, companies with high financial leverage appear to have lowered their dividend payout ratios to preserve their funds, as an alternative source of financing.

Concerning the determinants of the dividend payout ratio, the overall results show that, in the UK, corporate earnings are a major determinant. This relationship strongly supports previous empirical work. One line of argument is that managers view past and current levels of earnings as two of the main determinants of dividend policy (Baker & Powell, 2000; Brav et al., 2005; Kuo et al., 2013). Furthermore, companies with large dividend payouts might be using dividends to demonstrate their earnings potential and financial stability, in line with the signalling theory (Ho, 2003; Consler et al., 2011).

The researcher finds strong evidence in support of the free cash flow hypothesis. This finding indicates that firms attempt to disgorge their excess cash flows in the form of dividends rather than investing them in suboptimal projects that would increase unsystematic risk (Blau and Fuller, 2008). The positive association between free cash flow and the dividend payout ratio can be explained as firms with low dividend payouts wishing to signal that they have efficient performance. In addition, the presence of small percentages of institutional and insider ownership does not provide sufficient monitoring to overcome information asymmetry problems. Consequently, companies increase their dividend payout ratios in an attempt to minimize agency problems, in line with Eckbo and Verma (1994), Chay and Suh (2007), and Florackis et al. (2015). The negative association between liquidity measures and the dividend payout ratio proves that low-cash-holding firms make high dividend payouts because they consider dividends a pre-commitment device crucial in solving agency-related problems. In this respect, the researcher concludes that the agency theory strongly dictates the dividend payout ratios of UK firms, especially across the full sample, among small-sized companies, among firms with low dividend payouts, and within each sector.

The results lend support to the idea that UK firms might set their dividend payout ratios based on the flexibility hypothesis presented by Blau and Fuller (2008). This can be from the fact that firms with high liquidity have lower dividend payout ratios. The argument goes that firms lower their payout ratios at high levels of liquidity so as to be capable of responding to investment opportunities. Therefore, precautionary motives for holding cash explain firms' tendency to increase their cash holdings by minimizing their payout ratios, as seen with technology firms.

Consistent with the transaction cost theory, large-sized profitable firms have higher dividend payout ratios. This finding especially holds true for companies, at all levels of payout and across all sectors except for services. This line of argument states that large-sized profitable firms are renowned ones. Therefore, they can pay high dividends and raise required funds externally at a low cost. This result confirms the findings of Crutchley and Hansen (1989) and Basiddiq and Hussainey (2010). The negative association between liquidity and the dividend payout ratio indicates that firms honour their dividend payments at the expense of liquidity since they are capable of raising the necessary funds at low transaction costs due to their large size and profitability providing further support to the transaction cost theory. Furthermore, the positive association between leverage and the dividend payout ratio also supports the transaction cost theory. In this instance, leverage acts as an indicator of a firm's ability to raise external capital. Consequently, a highly leveraged company does not need to hold cash and can pay large dividends and rely on debt to finance its investments, consistent with Al-Najjar and Belghitar (2011) and Florackis et al. (2015).

This research finds solid evidence to support the hypothesis that firms with higher tax rates have higher dividend payout ratios. This indicates that a rise in corporate tax rates could increase companies' reliance on debt financing as a means of increasing their tax shields. This evidence is supported by the reported positive and significant relationship between leverage and dividend policy. In addition, the increase in companies' cost of equity capital, by historical standards and in absolute terms, is caused by their increased reliance on debt financing (Kay, 2012).

With regards to the impact of industry on dividend policy, the results reveal that technology firms show the strongest firm growth rates yet have the lowest payout ratios. This points to companies from this sector refraining from paying large dividends so as to preserve their cash flows for growth purposes. The high payout ratios could also indicate the abundance of investment opportunities for this group of firms. On the contrary, utilities report the highest payout ratios among all the sectors. Being heavily regulated, utilities force themselves to payout their cash in the form of dividends and seek external capital as a monitoring device (DeAngelo et al., 2004; Denis & Osobov, 2008). In contrast to all other sectors, for utilities, a strong presence of institutional investors is associated with a high dividend payout. This implies that the types of institutions that invest in utilities belong to the “value style” classification. This group favours firms with low growth rates that pay a large percentage of their earnings as dividends. Service sector firms appear to set their dividend payout ratios irrespective of either their systematic or unsystematic risk or their firm growth. It appears, though, that this group of firms pays dividends mainly to reduce agency-related conflicts.

The findings reject the notion that UK firms set their payout ratios based on the life cycle theory of dividends, since firms with high reserves of earned capital have low dividend payout ratios. This result implies that dividend retention is not considered a main source of financing for new investments in the UK. An alternative explanation is the tendency of UK firms to increase or stabilize their payout ratios by paying dividends out of accumulated retained earnings. This justifies the negative association between earned capital and the dividend payout ratio. The association between dividend payout ratios and measures of firm growth appears mixed and insignificant for a number of groupings. For large-sized firms, the positive association shows that such firms tend to be highly profitable, allowing them to honour their dividend payments and finance their investment needs in parallel. This evidence appears sensible in the case of utilities, which appear to be the largest in size, the most profitable, and the lowest in terms of firm growth, yet have the highest payout ratios, as mentioned earlier. On the other hand, technology firms with high firm growth have low dividend payout ratios. The researcher argues that firms in this group could be using dividends to signal their growth potential, especially given that they have the highest market-to-book ratios of all the sectors. Therefore, the residual theory of dividends does explain the dividend policies of technology firms. Firms that belong to this sector increase their payout ratios after satisfying their investment needs.

Recommendations for Further Research

This thesis sheds light on a number of interesting areas for future research. The researcher used annual data from Datastream. Unbalanced panel data was used to increase the number of observations. However, the researcher surmises that using semi-annual or quarterly data would increase the number of observations and make the results more comprehensive.

Among the contributions of the study is the use of interaction terms between firm risks and determinants of the dividend payout ratio. The results offer insights into the role risk plays in moderating the impacts of some dividend policy drivers. A potentially promising avenue would be to explore the impact of those interaction variables on the dividend payout ratios of financial companies, and to use multinational data to test the concept across different markets.

Despite the fact that cash dividends are the most prevalent form of distribution, researchers could retest the model using the same methodology for other forms of distribution, such as stock dividends and share repurchases. This could help determine the importance of systematic and unsystematic risk for managers' decisions about stock dividends and repurchases.

The methodology of this study can be extended to multinational firms. In this case major risks can be taken into consideration, such as country, inflation and foreign exchange risks.

Comparing the impact of the global financial crisis on different forms of dividend payouts, such as stock dividends and stock repurchases, in the UK could offer a further contribution. The reported impact on cash dividend payouts due to shocks to the supply of credit and demand caused by the crisis, appears confined to certain sectors, such as utilities and industrial firms. However, the researcher believes that looking at the impact of those shocks on stock dividends and repurchases could yield different results.

In terms of policymaking, if stock market authorities were able to enact and maintain trading policies that rapidly stabilize prices, then systematic and unsystematic risks would be stabilized as well.

Concerning investors, it is recommended that they keep well-balanced portfolios. The majority of UK companies are paying decreasing dividends. Consequently, investors face two challenges: namely, dealing with the changes in dividends and reinvestment of dividend income. When dividends are used for consumption purposes, stable dividends in terms of real pounds (i.e., dividend per share) should be preferred. If the amount of dividends received exceeds the required consumption, the surplus should be reinvested, such as in dividend reinvestment plans (DRIPs).

REFERENCES

Abarbanell, J., Bushee, B. & Ready, J. (2003). Institutional Investor Preferences and Price Pressure: the Case of Corporate Spin-Offs, *Journal of Business*, *76* (2), 233-261.

Abor, J.,& Bopkin, G.A. (2010). Investment opportunities, corporate finance and dividend payout policy: Evidence from emerging markets. *Studies in Economics and Finance*, *27*(3), 180-194.

Aggarwal, R.,& Dow, S.M. (2012). Dividends and strength of Japanese business group affiliation. *Journal of Economics and Business, 64*(3), 214-230.

Aharoney, J., and Swary, I. (1980). Quarterly Dividend, Earnings Announcement and Stockholders' Returns: An Empirical Analysis, *Journal of Finance*, *31(1)*, 1-12.

Aivazian, V., Booth L., &Cleary, S. (1999). Signaling, dividends and financial structure: Implications from cross country comparisons. Rotman School of Management, University of Toronto.

Aivazian, V., Booth, L., &Cleary, S. (2003). Do emerging market firms follow different dividend policies from U.S. firms? *Journal of Financial Research*, *26*(3), 371-387.

Akbar, S., Rehman, S.,& Ormrod, P. (2013). The impact of recent financial shocks on the financing and investment policies of UK private firms. *International Review of Financial Analysis, 26*, 59-70.

Allen, F., Bernardo, A., &Welch, I.W. (2000). A Theory of Dividends Based on Tax Clientele. *Journal of Finance, 55(6),* 2499-2536.

Allen, F.,& Michaely, R. (2003). Payout policy. *Handbook of the economics of finance*, *1A* (pp. 337-429). Amsterdam: North Holland.

Alli, K., Khan, A.Q., & Ramirez, G. (1993). Determinants of corporate dividend policy: A factoral analysis. *The Financial Review,* 28(4), 523-547.

Almeida, H., Campello, M., & Weisbach, M.S. (2004). The cash flow sensitivity of cash. *Journal of Finance, 59*(4), 1777-1804.

Alzahrani, M.,& Lasfer, M. (2012). Investor protection, taxation, and dividends. *Journal of Corporate Finance*, *18*(4), 745-762.

Al-Malakawi, H.A.N. (2007). Determinants of corporate dividend policy in Jordan: An application of the Tobit model. *Journal of Economic & Administrative Sciences, 23*(2), 44-70.

Al-Najjar, B., & Hussainey, K. (2009). The association between dividend payout and outside directorships. *Journal of Applied Accounting Research, 10*(1), 4-19.

Al-Najjar, B., & Belghitar, Y. (2011). Corporate cash holdings and dividend payments: Evidence from simultaneous analysis. *Managerial and Decision Economics, 32*(4), 231-241.

Amidu, M.,& Abor, J. (2010). Determinants of dividend payout ratios in Ghana. *The Journal of Risk Finance, 7*(2), 136-145.

Anderson, T.W.,& Darling, D.A. (1952). Asymptotic theory of certain "goodness-of-fit" criteria based on stochastic processes. *Annals of Mathematical Statistics*, *23*(2), 193-212.

Anderson, T.W., & Darling, D.A. (1954). A test of goodness of fit. *Journal of the American Statistical Association, 49*(268), 765-769.

Andres, C., Betzer, A., Goergen, M., &Renneboog, L. (2009). Dividend policy of German firms: A panel data analysis of partial adjustment models. *Journal of Empirical Finance, 16*(2), 175-187.

Anil, K., &Kapoor, S. (2008). Determinants of dividend payout ratios: A study of Indian information technology sector. *International Research Journal of Finance and Economics, 1*(1), 63-71.

Ang, A., & Liu, J. (2007). Risk, return and dividends. *Journal of Financial Economics, 85*(1),1-8.

Arellanno, M.,& Bond S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equation. *The Review of Economic Studies, 58*(2), 277-297.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error components models. *Journal of Econometrics, 68*(1), 29-51.

Arnott, R.D., & Asness, C.S. (2003).Surprise! Higher dividends=higher earnings growth. *Financial Analysts Journal, 59*(1), 70-87.

Asteriou, D., & Hall, S. (2011).*Applied econometrics: A Modern approach using eviews and microfit* (2nded.). London: Palgrave Macmillan.

Atieh, A. & Hussain, S. (2012). Accounting data and UK dividends. *Journal of Applied Accounting Research*, 13(1), 56-70.

Baker, H.K., Farrelly, G.E., & Edelman, R.B. (1985). A survey of management views on dividend policy. *Financial Management,14*(3), 78-84.

Baker, H.K., & Powell, G.E. (2000). Determinants of corporate dividend policy: A survey of NYSE firms. *Financial Practice and Education, Spring/Summer*, 29-40.

Baker, H.K., & Smith, D.M. (2006). In search of a residual dividend policy. *Review of Financial Economics, 15*(1), 1-18.

Baker, H.K., Chang, B., Dutta, S., & Saadi, S. (2013). Canadian corporate payout policy. *International Journal of Managerial Finance, 9*(3), 164-184.

Banyi, M., & Kahle, K. (2014). Declining propensity to pay: A re-examination of the life cycle theory. *Journal of Corporate Finance, 27,* 345-366.

Bali, R. (2003). An empirical analysis of stock returns around dividend changes. *Applied Economics, 35*(1), 51-61.

Baltagi, B.H. (2002). *Econometric analysis of panel data* (2nd ed.). Chichester: John Wiley and Sons, Ltd..

Bassidiq, H., & Hussainey, K. (2010). Does asymmetric information drive UK dividends propensity? *Journal of Applied Accounting Research*, *13*(3), 2-31.

Bates, T., Kahle, K., & Stulz, R. (2009). Why do U.S. firms hold so much more cash than they used to? *Journal of Finance*. *64*(5), 1985-2021.

Bathala, C.T., & Rao, R.P. (1995). The determinants of board composition: An agency theory perspective. *Managerial and Decision Economics, 16*(1), 59-69.

Baum, C.F., Caglayan, M., Ozkan, N., & Talavera, O. (2006). The impact of macroeconomic uncertainty on non-financial firms' demand for liquidity. *Review of Financial Economics*, *15*(4), 289-304.

Bell, L., & Jenkinson, T. (2002). New evidence of the impact of dividend taxation and on the identity of the marginal investor. *Journal of Finance*, *57*, 1321-1346.

Benito, A., &Young, G. (2003). Hard Times or great expectations? Dividend omissions and dividend cuts by UK firms. *Oxford Bulletin of Economics and Statistics, 65*(5), 531-555.

Berenson, M.L., Levine, D., & Krehbiel, T.C. (2009). *Basic business statistics: Concepts and applications* (12th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Berry, W.D., & Feldman, S. (1985). Multiple regression in practice. Sage University Paper Series on Quantitative Applications in the Social Sciences, series no. 07-050. Newbury Park, CA: Sage Publications, Inc.

Bildiq, R., Fatemi, A., & Fooladi, I. (2015).Global dividend payout patterns: The US and the rest of the world and the effect of financial crisis. *Global Finance Journal*, *28*, 38-67.

Bhattacharya, N. (1979). Imperfect information, dividend policy, and the bird in the hand fallacy. *Bell Journal of Economics*, *10*(1), 259-270.

Bhattacharya, S. (1980). Non-dissipative signaling structures and dividend policy. *Quarterly Journal of Economics, 95(1),* 1-24.

Bhattacharya, D., Li, W.H.,& Rhee, S.G. (2015). Does Better Corporate Governance Encourage Higher Payout? Risk, Agency Cost, and Dividend Policy. Working Paper. “Retrieved From” http://sfm.finance.nsysu.edu.tw/php/Papers/CompletePaper/056-2134404062.pdf.

Black, F.(1976). The dividend puzzle. *Journal of Portfolio Management, 2,* 5-84.

Black, F.,& Scholes, M. (1974). The effects of dividend yield and dividend policy on common stock prices and returns. *Journal of Financial Economics,1*(1), 11-22.

Blau, B.,& Fuller, K.P. (2008). Dividends and flexibility. *Journal of Corporate Finance, 14* (2), 133-152.

Bliss, B.A., Cheng, Y., &Denis, D.J. (2015). Corporate payout, cash retention and the supply of credit: Evidence from the 2008-2009 credit crisis. *Journal of Financial Economics, 115*(3), 521-540.

Blundell, R., &Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115-143.

Bond, S., Devereux, M., &Klemm, A. (2005). Dissecting dividend decisions: some clues about the effects of dividend taxation from recent UK reforms. IFS Working Papers, Institute for Fiscal Studies. “Retrieved From” http://www.ifs.org.UK/publications/3422.

Brandt, M., Brav, A., & Graham, J. (2005). The Idiosyncratic volatility puzzle: Time trend or speculative episodes? Unpublished working paper, Fuqua School of Business, DUKe University. “Retrieved From” https://faculty.fuqua.dUKe.edu/~mbrandt/papers/published/lowprice.pdf.

Brav, A., Graham, J.R., Harvey, C.R., & Michaely, R. (2005). Payout policy in the 21st century. *Journal of Financial Economics, 77,* 483-257.

Brealey, R.A., & Myers, S.C. (2006).*Principles of corporate finance* (8th ed.). Boston: Irwin/McGraw-Hill.

Brennan, M.J. (1970). Taxes, market valuation and financial policy. *National Tax Journal*, *23*(4), 417-429.

Brigham, E.F.,& Gapenski, L.C. (2002). *Financial management: Theory and practice* (10th ed.). Farmington Hills, MI: Thomson Learning, Inc.

Brittain, J. (1964).The tax structure and corporate dividend policy. *American Economic Review, 54*(3), 272-287.

Brockman, P., & Unlu, E. (2011). Earned/contributed capital, dividend policy, and disclosure quality: An international study. *Journal of Banking and Finance, 35*(7), 1610-1625.

Brooks, C. (2009). *Introductory econometrics for finance* (2nded.). Cambridge: Cambridge University Press.

Bun, C. (2005). Use dividends to signal or not: An examination of the UK payout pattern. *Managerial Finance, 31*(4), 12-33.

Bushee, B.J.,& Goodman, T.H. (2007). Which institutional investors trade based on private information about earnings and returns? *Journal of Accounting Research*, *45*(2), 289–321.

Cao, C., Simin, T., & Zhao, J. (2008). Can growth options explain the trend in idiosyncratic risk? Review of Financial Studies, *21*(6), 2599–2633.

Campbell, J.Y, Lettau, M., & Malkiel, B. (2001). Have individual stocks become more volatile? An empirical exploration of idiosyncratic risk. *Journal of Finance, 56*(1), 1-44.

Campbell, J.Y.,& Vuolteenaho, T. (2004a). Inflation illusion and stock prices. National Bureau of Economic Research Working Paper No. 10263.

Campbell, J.Y., & Vuolteenaho, T. (2004b). Inflation illusion and stock prices. *American Economic Review*, *94*(2), 19-23.

Campello, M., Giambona, E., Graham, J., & Harvey, C. (2011). Liquidity management and corporate investment during a financial crisis. *Review of Financial Studies*, *24*(6), 1944-1979.

Campello, M., Graham, J., & Harvey, C. (2010). The real effects of financial constraints: Evidence from a financial crisis. *Journal of Financial Economics*, *97*(3), 470-487.

Chang, R.P., &Rhee, S.G. (1990). The impact of personal taxes on corporate dividend policy and capital structure decisions. *Financial Management, 19*(2): 21-31.

Charest, G. (1978). Dividend information, stock returns and market efficiency. *Journal of Financial Economics, 6*(3), 297-330.

Charitou, A. (2000).The impact of losses and cash flows on dividends: Evidence for Japan. Abacus, 36 (2), 198-225.

Chay, J.B., &Suh, J. (2009). Payout policy and cash flow uncertainty. *Journal of Financial Economics*, *93(1),* 88-107.

Chazi, A., Boubakri, N., & Zanella, F. (2011). Corporate dividend policy in practice: Evidence from an emerging market with a tax-free environment. *Pacific Basin Financial Journal*, *19*(2), 245-259.

Chen, G., Firth, M.,& Gao, N.(2002). The information content of concurrently announced earnings, cash dividends, and stock dividends: An investigation of the Chinese stock market. *Journal of International Financial Management & Accounting*,13(2), 101-124.

Chetty, R., &Saez, E. (2010). Dividend and corporate taxation in an agency model of the firm. *American Economic Journal*, *2*(3), 1-31.

Consler, J., Lepak, G., &Havranek, S.F. (2011).Earnings per share versus cash flow per share as predictor of dividends per share. *Managerial Finance, 37*(5): 482-488.

Conover, W.J. (1999). Practical non-parametric statistics (3rd ed.). Chichester: John Wiley and Sons, Ltd.

Crutchley, C.E., & Hansen, R.(1989). A test of agency theory of managerial ownership, corporate leverage and corporate dividends. *Financial Management, 18*(4), 36-46.

DeAngelo, H., DeAngelo, L.,& Skinner, D. J. (2004). Are dividends disappearing? Dividend concentration and the consolidation of earnings. *Journal of Financial Economics, 72*(3), 425-456.

DeAngelo, H., DeAngelo, L., & Stulz, R. (2006). Dividend policy and the earned/contributed capital mix: A test of the life cycle theory. *Journal of Financial Economics, 81*(2), 227-254.

DeAngelo, H., DeAngelo, L., & Skinner, D. J. (2008). Corporate payout policy. *Foundations and Trends in Finance, 3*(2-3), 95-287.

Dempsey, S.J., Laber,G., & Rozeff, M. (1993). Dividend policies in practice: Is there an industry effect? *Quarterly Journal of Business and Economics, 32*(4), 1-13.

Denis, D. (2011). Financial flexibility and corporate liquidity. *Journal of Corporate Finance, 17*(3), 667-674.

Desai, M.A., & Jin, L.(2011). Institutional tax clienteles and payout policy. *Journal of Financial Economics, 100*(1), 68-84.

Denis, D., & Osobov, I. (2008). Why do firms pay dividends? International evidence on the determinants of dividend policy. *Journal of Financial Economics, 89* (1), 62-82.

Dhanani, A. (2005). Corporate dividend policy: The views of British Financial managers. *Journal of Business and Accounting, 32*(7), 1625-1672.

Dong, M., Robinson, C., & Vels, C. (2005). Why Individual investors want dividends. *Journal of Corporate Finance, 12(1),* 121-158.

Driver, C., Grosman, A. & Scaramozzino, P. (2015). Dividend decisions of UK firms and effects of the financial crisis, *Conference Paper.*

D'Espallier, B., Vandemaele, S., & Peeters, L. (2008). Investment-cash flow sensitivities or cash-cash flow sensitivities? An evaluative framework for measures of financial constraints. *Journal of Business Finance & Accounting, 35*(7-8): 943- 968.

D'Souza, J., & Saxena, A. (1999). Agency cost, market risk, investment opportunities and dividend policy: An international perspective. *Managerial Finance, 25*(6), 35-43.

Eades, K. (1982). Dividends as empirical evidence of firm value. *Journal of Financial and Quantitative Analysis, 17*(4), 471-500.

Easterbrook, F.H. (1984). Two agency cost explanations of dividends. *American Economic Review, 74*(4), 650-659.

Eckbo, E., & Verma, S. (1994). Managerial shareownership, voting power, and cash dividend policy. *Journal of Corporate Finance, 1*(1), 33-62.

Eije, H., & Megginson, W. (2008). Dividends and share repurchases in the European Union. *Journal of Financial Economics, 89*(2), 347-374.

El-Domiaty, T. (2010). The contribution of sales revenue management to firm growth: A test of two competing models. *International Journal of Revenue Management, 4*(2),131-144.

Elton, E.J., & Gruber, M.J. (1970). Marginal Stockholder tax rates and the clientele effect. *Review of Economics and Statistics, 52*(1), 68-74.

Faccio, M., & M. Lasfer. (2000). Do occupational funds monitor the companies in which they hold large stakes, *Journal of Corporate Finance, 6*(1), 71-110.

Fairchild, R. (2010). Dividend policy, signalling and free cash flow. *Managerial Finance, 36*(5), 394-413.

Fairchild, R., Guney, Y.,& Thanatawee, Y. (2014). Corporate dividend policy in Thailand: theory and evidence. *International Review of Financial Analysis, 31*, 129-151.

Fama, E.F., & Babiak, H. (1968).Dividend policy of individual firms: An empirical analysis. *Journal of the American Statistical Association, 63*(324), 1132-1161.

Fama, E.F., & French, K. (2001). Disappearing dividends: Changing firm characteristics or lower propensity to pay? *Journal of Financial Economics, 60*(1), 3-43.

Fargher, N.L.,& Weigand, R.A. (2009). Cross-Sectional differences in the profits, returns and risk of firms initiating dividends. *Managerial Finance, 35*(6), 509-530.

Farinha, J. (2003). Dividend policy, corporate governance and the managerial entrenchment hypothesis: An Empirical analysis. *Journal of Business, Finance and Accounting. 30*(9-10), 1173-1209.

Fatemi, A., &Bildiq, R. (2011). Yes, dividends are disappearing: Worldwide evidence. *Journal of Banking and Finance, 36(*3), 662-677.

Ferreira, M.A., & Vilela, A.S. (2004). Why do firms hold cash? Evidence from EMU countries. *European Financial Management, 10*(2), 295-319.

Ferris, S.P.,Sen, N.,& Yui, H.P. (2006). Are fewer firms paying more dividends? The international evidence. *Journal of Multinational Financial Management, 16(4),* 333-362.

Field, A.P. (2009).*Discovering statistics using SPSS* (3rd ed.).London: Sage Publications Ltd.

Firth, M., Gao, J., Shen, J., & Zhang. Y. (2016). Institutional stock ownership and firms' cash dividend policies: Evidence from China. *Journal of Banking & Finance, 65,*91-107.

Florackis, C., Kanas, A., & Kostakis, A. (2015). Dividend policy, managerial ownership and debt financing: A non-parametric perspective. *European Journal of Operational Research, 241*(3), 783-795.

Frankfurter, G.M., &Wood, B.G. (1997). The evolution of corporate dividend policy. *Journal of Financial Education, 23*(1), 16-32.

Floyd, E., Li,N. & Skinner, D. (2015). Payout policy throughout the financial crisis: The growth of repurchases and the resilience of dividends. Journal of Financial Economics, *118* (2), 299-316.

Geiler, P., Renneboog, L.,(2015).Taxes, earnings payout, and payout channel choice. *Journal of International Financial Markets, Institutions and Money*, 37, 178-203.

Ghosh, C., &Woolridge, J.R. (1991). Dividend omissions and stock market rationality. *Journal of Business Finance and Accounting, 18*(3), 315-330.

Gill, A., Biger, N.,& Tibrewala, R. (2010). Determinants of dividend payout ratios: Evidence from United States. *Open Business Journal, 6,* 8-14.

Goergen, M., Rennenboog, L.,& Da Silva, L. (2005). When do German firms change their dividends? *Journal of Corporate Finance, 11*(1-2), 375-399.

Goldfeld, S.,& Quandt, R. (1965). Some tests for homoscedasticity. *Journal of the American Statistical Association*, 60, 539-547.

Gordon, M.J.(1962). The savings investment and valuation of a corporation. *Review of Economics and Statistics, 44*(1), 37-51.

Greene, W.H. (2000). Econometric analysis (4th ed). Upper Saddle River, NJ: Pearson Prentice Hall.

Grinstein, Y.,& Michaely, R. (2005). Institutional holdings and payout. *Journal of Finance, 60,* 1389-1426.

Grossman, S.J.,& Hart, O.D. (1982). Corporate Financial Structure and Managerial Incentives. Edited By John Mccall. Chicago: University Of Chicago Press,107-140.

Grullon, G., Michaely, R.,& Swaminathan, B. (2002). Are dividend changes a sign of firm maturity? *Journal of Business, 75*(3), 387-424.

Gujarati, D. (2003). *Basic econometrics* (4th ed.). New York: McGraw-Hill, Gul, F. (1999). Growth opportunities, capital structure and dividend policies in Japan. *Journal of Corporate Finance*, *5*, 141-168.

Hanlon, M., Myers, J. & Shevlin, T. (2006). The information content of dividends: Do dividends provide information about future earnings? Working Paper. “Retrieved From” www.ssrn.com.

Hansen, L. (1982). Large sample properties of generalized method of moments estimators. *Econometrica*, *50*(4), 1029-1054.

Harada, K.,& Nguyen, P. (2011). Ownership concentration and dividend policy in Japan. *Managerial Finance*, *37*(4), 362-379.

Hauser, R. (2013). Did dividend policy change during the financial crisis? *Managerial Finance, 39*(6), 584-606.

Hausman, J.A. (1978). Specification tests in econometrics. *Econometrica*, *46*(6), 1251-1271.

Healy, P.M., & Palepu, K.G. (1988). Earnings information conveyed by dividend initiations and omissions. *Journal of Financial Economics*, 21, 149–175

Hildreth, W.B.,& Richardson, J.A. (eds.). (1999). *Handbook on taxation.* New York: Marcel Dekker.

Ho, H. (2003). Dividend policies in Australia and Japan. *International Advances in Economic Research*, *9*(2), 91-100.

Hoberg, B.,& Prabhala, N. (2009). Dividend Policy, Risk, and Catering. *Review of Financial Studies*, *22*(1), 79-116.

Holder, M.E., Langrehr, F.W.,& Hexter, L. (1998). Dividend policy determinants: An investigation of the influences of stakeholder theory. *Financial Management*, *27*(3), 73-81.

Hsiao, C. (1986). *Analysis of panel data.* Cambridge MA: Cambridge University Press.

Huang, C.W., Ho, P.H., Lin, C.Y. & Yen, J.F. (2014). Firm age, idiosyncratic risk, and long-run SEO underperformance. International Review of Economics and Finance, 34, 246-266.

Huang, C.W. & Paul,D. (2016). Institutional holdings, investment opportunities and dividend policy. Quarterly Review of Economics and Finance, in press.

Hussainey, K. (2009). Do dividends signal information about future earnings? *Economic Letters*, *16*(12), 1285-1288.

Hussainey, K. & Al-Eisa, J. (2009). Disclosure and dividend signalling when sustained earnings growth declines. *Managerial Auditing Journal, 24*(5), 445-454.

Hussainey, K., Mgbame, C.O.,& Mgbame, A.M. (2011). Dividend policy and share price volatility: UK evidence. *The Journal of Risk Finance*, *12*(1), 57-68.

Hutchinson, M., Seamer, M. & Chapple, L. (2015). Institutional investors, risk/performance and corporate governance. The International Journal of Accounting, *50*(1), 31-52.

Ince,U. & Owers, J. (2012). The interaction of corporate dividend policy and capital structure decisions under differential tax regimes. *Journal of Economics and Finance*, *36*(1), 33-57.

Ivashina, V., & Scharfstein, D. (2010). Bank lending during the financial crisis of 2008. *Journal of Financial Economics*, *97*(3), 319–338.

Jain, R. (2007). Institutional and individual investor preferences for dividends and share repurchases. *Journal of Economics and Business, 59*(5), 406-429.

Javakhadze, D., Ferris, S.,& Sen, N. (2014). An international analysis of dividend smoothing. *Journal of Corporate Finance*, *29*, 200-220.

Jensen, G.R., Solberg, D.,& Zorn, T. (1992). Simultaneous determination of insider ownership, debt, and dividend policies. *Journal of Financial and Quantitative Analysis*, *27*(2), 247-263.

Jensen, M.C. (1986). Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review, 76*(2), 323-339.

John, K. & Williams, J. (1985). Dividends, dilution, and taxes: A signalling equilibrium. *Journal of Finance, 40*(4), 1053-1070.

Jordan, B., Liu, M. & Wu, Q. (2014). Corporate payout policy in dual class firms. *Journal of Corporate Finance*, 26, 1-19.

Kalay, A. (1980). Signaling, information content and the reluctance to cut dividends. *Journal of Financial and Quantitative Analysis, 15*(4), 855-869.

Kale. J., Kini, O.,&Payne, J. (2012). The dividend initiation decision of newly public firms: Some evidence on signaling with dividends. *Journal of Financial and Quantitative Analysis, 47*(2), 365-396.

Kay, J. (2012). The Kay review of UK equity markets and long-term decision making. London: UK Department for Business Innovation and Skills.

Khan, T. (2006). Company dividends and ownership structure: Evidence from UK panel data. *The Economic Journal, 116*(510), 172-189.

Kuo, J.M., Philip, D., & Zhang, Q. (2013). What drives the disappearing dividends phenomenon? *Journal of Banking and Finance, 37(9),* 3499-3514.

Lang, L., & Litzenberger, R. (1989). Dividend announcements: Cash Flow signalling vs. free cash flow hypothesis? *Journal of Financial Economics, 24(1),* 181-191.

Lasfer, M.A. (1996). Taxes and dividends: The UK evidence. *Journal of Banking and Finance*, 20(3), 455-472.

Lee, A. F., Gupta, M., Chen, H., & Lee, A.C. (2011). Optimal payout ratio under uncertainty and the flexibility hypothesis: Theory and empirical evidence. *Journal of Corporate Finance, 17,* 483-501.

Lee, Y.J. (2006). Diagnostic testing for dynamic panel data models. Working paper. Indiana

University. "Retrieved From" http://www.wise.xmu.edu.cn/panel2007/paper/LEE(Yoon-Jin).pdf.

Levin, A., Lin, C.,& Chu, C.J. (2002).Unit root tests in panel data: Asymptotic and finite sample properties. *Journal of Econometrics, 108*(1),1-24.

Lin, T.J, Chen, Y.P.,& Tsai, H.F. (2016). The relationship among information asymmetry, dividend policy and ownership structure. *Finance Research Letters*, in press.

Lintner, J. (1956). Distribution of incomes of corporations among dividends, retained earnings, and taxes. *American Economic Review, 46*(2), 97-113.

Litzenberger, R.H.,& Ramaswamy, K. (1979). The effect of personal taxes and dividends on capital asset prices: Theory and empirical evidence. *Journal of Financial Economics, 7*(2), 163-195.

Lloyd, P.,Jahera, J.,& Page, D. **(**1985). Agency costs and dividend payout ratios. *Quarterly Journal of Business and Economics, 3*(78), 19–29.

Ma, T. (2012). Corporate dividend decisions. (Unpublished Doctoral thesis, City University London)

Malkiel, B.,&Xu, Y. (2003). Investigating the behaviour of idiosyncratic volatility. *Journal of Business, 76*(4), 613-643.

Maffini, G. (2013).Corporate tax policy under the Labour government, 1997-2010. *Oxford Review of Economic Policy, 29*(1), 142-164.

Mian, A.,& Sufi, A. (2010). The Great Recession: Lessons from Microeconomic Data. *American Economic Review, 100*(2), 1-10.

Michel, A. (1979). Industry influence on dividend policy. *Financial Management, 8*(3), (Autumn), 22-26.

Miller, M.H., & Modigliani, F. (1961). Dividend policy, growth and the valuation ofshares. *Journal of Business 34*(4), 411-433.

Miller, M.H., & Scholes, M.S. (1978). Dividends and taxes. *Journal of Financial Economics*, *6*(4), 333-364.

Miller, M.H. & Scholes, M.S.(1982). Dividend and taxes: Some empirical evidence. *Journal of Political Economy, 90*(6), 1118-1141.

Miller, M.H., & Rock, K. (1985). Dividend policy under asymmetric information. *Journal of Finance*, *40*(4), 1031-1051.

Mollah, A., Keasey, K., & Short, H.(2000). The influence of agency costs on dividend policy in an emerging market: Evidence from Dhaka Stock Exchange. Working paper. "Retrieved From" http://www.bath.ac.UK/centres/CDS/enbs-papers/Mollahnew.htm.

Morck, R.,& Yeung, B. (2005). Dividend taxation and corporate governance. *Journal of Economic Perspectives*, *19*(3), 163-180.

Moyer, R.C., Rao, R.,& Tripathy, N. (1992). Dividend policy and regulatory risk: A test of the Smith hypothesis. *Journal of Economics and Business*, *44*(2), 127-134.

Mueller, D.C. (1972). A Life cycle theory of the firm. *Journal of Industrial Economics, 20*(3), 199-219.

Myers, S. (1984). The capital structure puzzle. *Journal of Finance, 39*(3), 572-592.

Myers, S.C., & Majluf, N.S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221.

Nadeau, S.J., & Strauss, J. (1993). Taxation, equity, and growth: Exploring the trade-off between shareholder dividend tax relief and higher corporate income tax. *National Tax Journal*, *46*(2), 161-175.

Neves, E., & Pindado, J. (2006). Dividends: new evidence on the catering theory. Working paper. University of Salamanca. "Retrieved From" http://gredos.usal.es/jspui/bitstream/10366/75241/1/DAEE_14_06_Dividens.pdf.

Officer, M. (2011). Overinvestment, corporate governance, and dividend initiations. *Journal of Corporate Finance, 17*(3), 710–724.

Opler,T.,Pinkowitz, L., Stulz, R., &Williamson, R.(1999). The determinants and implications of corporate cash holdings. *Journal of Financial Economics, 52*(1), 3-46.

Ozkan, A.,& Ozkan, N. (2004). Corporate cash holdings: An empirical investigation of UK companies. *Journal of Banking and Finance*, *28*(9), 2103-2134.

Panousi, V., & Papanikolaou, D. (2012). Investment, idiosyncratic risk, and ownership. *Journal of Finance,67*(3), 1113-1148.

Pastor, L., & Veronesi, P. (2003). Stock valuation and learning about profitability. *Journal of Finance, 58*(5), 1749-1789.

Paulo, S. (2010). Distributions, the UK Companies Act of 2006, and the Miller and Modigliani (1961) dividend irrelevance argument. *International Journal of Law and Management, 52*(5), 369-382.

Pettit, R.R. (1977). Dividend announcements, security performance, and capital market efficiency. *Journal of Finance, 27*(5), 993-1007.

Poterba, J.M.,& Summers, L.H. (1984). New evidence that taxes affect the valuation of dividends. *Journal of Finance, 39*(5), 1397-1415.

Pruitt, S.W., & Gitman, L.W. (1991). The interactions between the investment, financing and dividend decisions of major US firms, Financial Review, 26 (33), 409-30.

Ramsey, J.B. (1969). Tests for specification errors in classical linear least-squares regression analysis. *Journal of Royal Statistical Society, B31*(2), 350-371.

Rapp, M.S., Schmid, T.,& Urban, D. (2014).The value of financial flexibility and corporate financial policy. *Journal of Corporate Finance, 29,* 288-302.

Renneboog, L., & Trojanowski, G. (2011). Patterns in payout policy and payout channel choice, *Journal of Banking and Finance, 35*(6), 1477-1490.

Ross, S.A. (1977). The Determination of financial Structure: the Incentive-Signalling Approach, *Bell Journal of Economics,8*(1), 23-40.

Rozeff, M. (1982). Growth beta and agency costs as determinants of dividend payout ratios. *Journal of Financial Research, 5(3),* 249-259.

Rubin, A., & Smith, D. (2009). Institutional ownership, volatility and dividends. *Journal of Banking and Finance, 33*(4), 627-639.

Salih, A.A. (2010) The Effect of Dividend Policy on Market Value UK Empirical Study. Doctoral thesis, Durham University. Available at Durham E-Theses Online: http://etheses.dur.ac.UK/556/.

Santos, J.A.C. (2011). Bank corporate loan pricing following the subprime crisis. *The Review of Financial Studies*, 24(6), 1916-1943.

Sapra, S. (2005). A regression error specification test (RESET) for generalized linear models. *Economics Bulletin*, 3(1), 1-6.

Schmidheiny, K. (2011). Panel data: Fixed and random effects. *Short Guides to Microeconometrics*, 2-7.

Schooley, D.K., & Barney, L.D. (1994). Using Dividend Policy and Managerial Ownership to Reduce Agency Costs. *Journal of Financial Research, 17*(3), 363-373.

Sharon, K.,& Frank, B. (2005). What factors motivate the corporate dividend decision? *ASBBS E-Journal, 1*(1), 97-107.

Sharpe, W.F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance, 19,* 426-442.

Short, H., Zhang, H., & Keasey, K. (2002). The link between dividend policy and institutional ownership. *Journal of Corporate Finance, 8,* 105-122.

Singhania, M. (2006). Taxation and corporate payout policy. *Vikalpa, 31*(4), 47-64.

Smith, C.W. (1986). Investment banking and the capital acquisition process. *Journal of Financial Economics, 15,* 3-29.

Smits, R. (2012). Effect of a financial crisis on the dividend payout policy of a firm, (Unpublished Master Thesis, Tilburg University).

Stephens, M.A. (1974). EDF Statistics for goodness of fit and some comparisons. *Journal of the American Statistical Association*, *69*(347), 730-737.

Stephens, M.A. (1979). Test of fit for the logistic distribution based on the empirical distribution function. *Biometrika, 66*(3), 591-595.

Stephens, M.A. (1986). Tests based on EDF statistics. In R. B. D'Agostino & M. A Stephens (Eds.), *Goodness-of-fit techniques* (pp. 97-193). New York: Marcel Dekker.

Thanatawee, Y. (2011). Life-cycle theory and free cash flow hypothesis: Evidence from dividend policy in Thailand. *International Journal of Financial Research*, *2*(2), 52-60.

Thursby, J., &Schmidt, P. (1977). Some properties of tests for specification error in a linear regression model. *Journal of the American Statistical Association*, *72*(359), 635-641.

Uwuigbe, O., &Olusegun, O. (2013). The Effects of company income tax on dividend policy of firms in Nigeria. E*conomica*, *9*(1), 79-90.

Venkatesh, P.C.,& Chiang, R. (1986). Information asymmetry and the dealer's bid-ask spread: A case study of earnings and dividend announcements. *Journal of Finance, 41*(5): 1089-1102.

Vieira, E.S. and Raposo, C.C. (2007). Lower Propensity to Pay Dividends? New Evidence from Europe. Working paper. Universidade de Aveiro, www.ssrn.com.

Walter, J. (1963). Dividend policy: Its influence on the value of the enterprise. *Journal of Finance, 18*(2), 280-291.

Warther, V. (1993). Boards, dividends, and sleeping dogs. Ph.D. dissertation, University of Chicago.

White, H. (1980). A heteroscedasticity-consistent covariance matrix estimator and a direct test for heteroscedasticity. *Econometrica*, *48*(4), 817-838.

Wright, J. (2000). Alternative variance-ratio tests using ranks and signs. Journal of Business and Economic Statistics, 18, 1-9.

Wu, C. (1996). Taxes and dividend policy. *International Review of Economics and Finance, 5*(2), 291-305.

Yaffee, R.A. (2002). A Primer for panel data analysis. Working paper: New York University. "Retrieved From" http://nyu.edu/its/statistics/Docs/pda.pdf.

Yoon, P.S.,& Starks, L.T. (1995). Signaling, investment opportunities and dividend announcements. *Review of Financial Studies*, 8(4), 995-1018.

Zeckhauser, R., &Pound, J. (1990). Are large shareholders effective monitors? An investigation of share ownership and corporate performance. In: Hubbard, G. (Ed.), *Asymmetric information, corporate finance, and investment* (pp. 149-180).Chicago: University of Chicago Press.