PROFITABILITY CHANGE PERSISTENCE, MANAGERIAL OVERREACTION, AND DIVIDEND POLICY

XIEHUA JI

PROFITABILITY CHANGE PERSISTENCE, MANAGERIAL OVERREACTION, AND DIVIDEND POLICY

A thesis submitted by **Xiehua Ji**, BSc MSc in accordance with the requirements of Durham University for the degree of Doctor of Philosophy

Supervisors

Dr. Chi-hsiou Hung* and Dr. Anurag Narayan Banerjee

Department of Business School

Durham University

September 2015

*Adam Smith Business School, Glasgow University, UK

Profitability Change Persistence, Managerial Overreaction, and Dividend Policy

Xiehua Ji

Abstract

This thesis proposes a hypothesis that managerial overreaction of past earnings performance which can affect managers' dividend decisions. This proposition claims that managers can extrapolate earnings growth/decline over the past few years into the future, and then managers may make dividend decisions based on their expectation of such extrapolation. Managerial extrapolation is different from managerial overconfidence, although they both belong to managerial overreaction. To examine this hypothesis, we follow Fama and French (2001), Baker and Wurgler (2004a) and Hoberg and Prabhala (2009)'s methodology to test whether managerial extrapolation which is represented by firms' earnings persistent growth/decline over the past five or three years can affect managers' decisions to initiate/continue/increase/pay/omit/decrease dividends, given other conventional determinants including size, investment opportunities, profitability, and risks. We find robust evidence that indicators of managerial extrapolation have significant effects on firms' dividend decisions during the in-sample period from 1963 to 2000, the out-of-sample period from 2001 to 2013, and the whole sample period from 1963 to 2013 in the U.S. market before or after controlling for recession or financial crisis. Further, we find that firms who initiate/continue/increase/pay dividends after experiencing past growing earnings do not show future growth in profitability, while firms who omit/decrease dividends after experiencing past declining earnings do not show future decline in profitability. Our findings hold when we use alternative measurements to form proxies of managerial extrapolation by using positive EPS only, by using past sales growth/decline, or by using past free cash flow growth/decline. Importantly, we find that the significant impact of managerial extrapolation on firms' dividend decisions is not affected after considering other managerial behaviour factors including catering incentive to dividends (Baker and Wurgler, 2004a) and different measurements of managerial overconfidence based on option-holding activities, investment ratio, or managers' net-buying activities on their own firms' shares.

Table of Contents

List of Tables

List of Figures

Declaration and Statement of Copyright

Declaration

No material contained herein has been previously submitted for any other degree. Except where acknowledged, all material is the work of the author.

Statement of Copyright

Date:…………………………….

Signed:……………………………..

Acknowledgements

The old proverb "*Rome was not built in a day*" may have been used over-frequently, but I have not made myself fully understand of it until I finished spelling the last word of my thesis. This thesis was built by thousands of hours' programme coding as steel fine and hundreds of times' amendment as stones. It has cost five years in total and has been accomplished after untold hardship. It might be a trivial achievement for a successful academic career, but it can be the first step of a great academic career.

Being able to finish this thesis, I first want to give my special thanks to my supervisors: Dr. Chi-hsiou Hung and Dr. Anurag Narayan Banerjee, for their selfless guidance and help. I indeed feel grateful for Dr. Hung's professional help in writing skills, powerful recommendation on my research direction and unreserved supervision on SAS coding. I sincerely appreciate Dr. Banerjee's supervision in professional knowledge, suggestions in academic writing skill, and in pointing out mistakes in my model's constructing which is particularly important. I especially want to give my thanks to Dr. Hung who discussed with me and supervised me nearly every day in the last month before I finish this PhD thesis. Thanks to uncountable hours Dr. Hung and Dr. Banerjee have spent on me. It is their efforts which made my thesis better.

I want to thank my parents who are thousands of miles always but still care about my life during my PhD studies and discussed with me from a non-academic view on my research topics. They always stand by my side and support me without asking for any paying back. I also want to thank my lovely wife Yujie Hu who accompanies with me, always encourages me and makes me believe that I can be a better man. I give my last but not least thanks to all friends around me duringmy PhD studies. They are but not limited to PhD or PhD students: Junhong Yang, Ruirui Hu, Yukun Shi, Pei Liu, Jiayuan Xin, Lisa Luo, Zhenglong Li, Qingrui Meng, Zhuang Zhang, Qingjing Zhang, Yang Dai, Sheng Yang, Hongliang Wang, Xin Li, Meihong Dai, Jingyu Zhang, Yanjun Tan, Naixin Guo, Yang Zhang, He Li, Jiawei Wu, Lulu Wang, Jing Nie, Min Li, Yuyan Zheng, Xiaotong Zheng, Junqi Li, Yakun Zhang, Jieke Chen, Yi Gu, Hala, Eliud, Niza, Ocean, Hui Xi, Xinwei Shi, Yunhan Hu, Feifei Liu, Chaoqun Liu, Tao Xue, Yun Zhang, Miao Han, Jin Huang, Miao Liu, Anthea, Warda Jamal, Xing Huan, Li Xie, Si Zhou, Wei Song, Yutong Wang, Zhimin Xiao, Hui Yang, Yuchao Peng, Leilei Gu, and academia I know are ever in Durham University Business School: Zhichao Zhang, Frankie Chau, Rataporn Deesomsak, Zhiyun Li, Dennis Philips, Parantap Basu, Xiaogang Che, Michael Guo, Richard Harris, Nan Shi, Rebecca Stratling, Ian Whitfield, Hong II Yoo, Yizhe Dong, Jingming Kuo, Wenxuan Hou, Zhifeng Tong, Binghan Zheng, Jiankang Shi.

As I have described, this thesis may be only a trivial branch of the whole big behaviour finance tree, and it is not perfect. However, writing this thesis makes me understood how important the persistence is when doing academic research. We cannot reach to the top of a mountain without climbing and concurring difficulties on the half-way, and only keeping focus and open-minded can finally bring fruitful returns. I learned from my PhD thesis and will make my endeavour to develop it better. I strongly believe in the value of what I was doing and am going to do. I also believe that this thesis will open a door for a new potential research topic which deserves other researchers and me to dig into and further investigate. With faith and efforts, this new and trivial branch is bound to grow up and bear rich fruit.

CHAPTER 1 INTRODUCTION

1.1. Introduction

The behaviour of managers in corporate finance is becoming one of main streams in corporate finance textbooks and the investigation of managers' behaviour is one of its main branches. Managers' behaviour bias includes 'overconfidence' (overestimate, overplacement, and overprecision in psychology literature) and 'overextrapolation'; both belong to managerial overreaction. There have been widespread discussions about the impact of managers' overconfidence on corporate decisions like merger and acquisition, investment strategy, and payout policy, and there is also literature about investors' overextrapolation resulting in mispricing. However, the previous literature lacks discussion about the impact of managers' activities in extrapolating firms' future performance in making corporate decisions. A firm's dividend policy is one of main distribution methods the firm can use to pay back investors' profits. A firm's dividend decisions can be affected by varying factors including fundamental factors like the firm's profitability, size, and market to book ratio, and it can also be affected by managers' behavioral factors like extrapolation which we will discuss in this thesis.

1.2. Background

1.2.1. Investors' irrationality and managers' irrationality in behaviour finance

Before the rise of behaviour finance as one of main explanations for phenomena in the financial markets, the conventional finance paradigm assumed that agents are rational in updating their knowledge after correctly understanding new information, and then making decisions based on it (Baker and Wurgler, 2013). For the majority of conventional research on financial markets, managers and investors have fully rational expectations and preferences, and make decisions by following the rule of the Efficient Markets Hypothesis (EMH). Although conventional theory assumes that the market is efficient and both investors and managers are rational, the real market is inefficient because of limited arbitrage (Miller, 1977; De Long et al., 1990; Shleifer and Vishny, 1997; D'Avolio, 2002), and there are risks and costs to correct the mispricing caused by irrational investors under limited arbitrage (Pontiff, 1996; Wurgler and Zhuravskaya, 2002; Acharya and Pedersen, 2005).

Arguments based on irrationality of investors and managers were boosted around the mid-1990s when some phenomena in the financial markets could not be fully explained by conventional theories (Baker and Wurgler, 2012). On the one hand, investors may become irrational in making investment decisions under several explanations such as investors' category views about financial instruments (Barberis and Shleifer, 2003), investors' prospects based on reference points (Shefrin and Statman, 1985; Ferris et al., 1988; Huddart et al., 2009), and investors' biased beliefs caused by anchoring (Tversky and Kahneman, 1974). On the other hand, managers may become irrational in making corporate decisions under assumptions such as managerial hubris may lead to overly payment in acquirers to takeover target firms

(Roll, 1986), managers' overconfidence (Malmendier and Tate, 2005; Malmendier and Tate, 2008; Ben-David, 2013), managers' overextrapolation[1] (Tversky and Kahneman, 1974; Alti and Tellock, 2011), and managers' projection biases (Loewenstein et al., 2003; Conlin et al., 2007). Whether managers are smart enough to detect investors' irrationality and make rational decisions is another issue under discussion (Seyhun, 1992; Gao and Ritter, 2010; Baker and Stein, 2004; Greenwood et al., 2010). Besides, managers could make financial decisions based on the overreaction of the market, despite whether managers are rational or not (e.g. Shleifer and Vishny, 2003).

It is difficult to analyse biases caused by behavioral factors, because biases cannot be simply attributed to only one behavioral explanation. Investors' irrationality and managers' irrationality may operate at the same time, and there could still be managerial behavioral bias under the assumption of rationality and standard preference (Baker and Wurgler, 2012). A detailed analysis based on multiple-channels of rationality and irrationality can be a better choice than a model with only one possible explanation.

1.2.2. Managers' behavioral biases and dividend policy

We narrow down the discussion of behavioral biases to the topic of firms' dividend decisions. After considering fundamental factors' impacts on firms' dividend decisions (Fama and French, 2001), behavioral biases from investors (Baker and Wurgler, 2004a) and managers (Malmendier and Tate, 2005) also play an essential

[1] To the best of our knowledge, there is no extant research focusing on managers' 'overextrapolation'. The research of Tversky and Kahneman (1974) and Alti and Tellock (2011) are about extrapolation from individuals and agents, which can include both investors and managers.

role in affecting firms' final payout decisions. In terms of investors' behavioural biases, the catering theory (Baker and Wurgler, 2004a; Baker and Wurgler, 2004b) describes investors' demand on dividends and rational managers' concern on satisfying this demand. Bird-in-hand theory (Gordon, 1959), self-control purpose (Thaler and Shefrin, 1981), and mental accounting (Shefrin and Statman, 1984) are also investors' behavioral biases in showing possible irrational preference in dividends. In terms of managers' behavioral biases, managerial overconfidence can cause changes in dividend policy. Managers who are overconfident in expecting high future cash flow will increase dividends (Wu and Liu, 2011), while managers who are overconfident in predicting high future investment need and costly external finance will tend to decrease dividends (Deshmukh et al., 2013). In addition, the theoretical model of Baker and Wurgler (2013) with the setting of full rationality concludes that managers can use dividends as a signal of future performance.

Among previous literature of managers' biases on dividend policy, theoretical argument and empirical evidence about managers' overconfidence on payout policy have been better developed than that for argument and evidence about managers' extrapolation on payout policy. There is also plenty of discussion and practical evidence for the impact of investors' overextrapolation on the biases in the financial market (e.g. Lakonishok et al., 1994; La Porta, 1996; Barberis et al., 1998; Greenwood and Hanson, 2013), but there are few papers about managers' overextrapolation in affecting financial decisions.

1.3. Motivation of the research

The first motivation of this research is that the impact of behavioral bias can hardly be ruled out in analysing determinants of firms' dividend policy. DeAngelo et al.

(2008) summarize previous literature about behavioral influences on firms' payout policy. They conclude that managerial behavioral biases can be a powerful explanation for payout policy, as they "see no good reason to mandate an 'either/or' choice between conventional agency and behavioral influences on managerial decision-making". Compared with conventional theory and factors claimed to affect firms' payout policy, behavior-related arguments are newer and not discussed further. A 'horse race' with all fundamental factors and behavioral factors is required for better analysis in issues of corporate finance.

The second motivation is that proper proxy for behavioral factors in explaining payout policy are still under debate. The catering theory (Baker and Wurgler, 2004a) indicates that managers tend to cater for investors' demand on dividends, and Baker and Wurgler (2004b) find empirical evidence to support the argument that changes in propensity to pay is positively affected by investors' demand on dividends for each appearance or disappearance of dividend payers. Baker and Wurgler (2004b) conclude that the disappearance of dividend payers after the 1970s is explained by the dividend premium which is the proxy of investors' demand in dividends. Although Hoberg and Prabhala (2009) argue that the dividend premium (Baker and Wurgler, 2004a) is only a proxy for firms' risk and cannot directly explain the propensity to pay dividends, they also suggest that a more reliable proxy of behavioral factors should be developed to explain firms' dividend policy.

The third motivation of this research is the re-appearance of dividends. Dividend payers began to re-appear from 2002 (see Chapter 2 for details), after Fama and French (2001) came to the conclusion that dividend was disappearing. Several years later, researchers tried to investigate the cause of dividend fads in the U.S. market based on a sample period no later than 2004 (DeAngelo et al., 2004; Baker and

Wurgler, 2004b; Hoberg and Prabhala, 2009). Therefore, it is worthwhile to investigate the cause of re-appearances in dividends by jointly considering varying conventional factors and behavioural factors after 2002. We suggest that the lack of U.S. firm-year observation after 2004 is caused by the change in the format of WRDS' data set from FTP to XPF, when the FTP format of COMPUSTAT data has observations until 2004 and the XFP format of COMPUSTAT data has frequent updated observations. The FTP format of COMPUSTAT data uses data number as the name of items, while the XPF format of COMPUSTAT data uses data name in short as the name of items. This change in items' name may cause inconvenience in applying the data from previous research. We also find that firm-year observations in FTP format COMPUSTAT data and observations in XPF format COMPUSTAT data are slightly different. These differences may not affect the conclusions of most research, but a robustness check is recommended for later research related to this data set. This robustness check by using different formats of data set and time period can be a sub-motivation of the third motivation.

The fourth motivation is what has been mentioned in section *1.1.2* about the research gap in previous literature. There is still not paper focus on managerial overextrapolation in influencing dividend policy based on our knowledge. My research develops a proper proxy of managerial overextrapolation explanation for dividend policy through the dividend signalling theory. We hypothesize that managers may extrapolate future earnings performance after observing positive past performance, and then initiate/increase/pay dividends which are "sticky" or use dividends as the signal to attract investors. Although trivial practical supports have been found for the dividend signalling hypothesis by some researchers (e.g. Watt, 1973; DeAngelo et al., 1996; Benartzi et al., 1997), it does not indicate that managers will not use dividend as the signal to attract investors. In fact, when managers are overconfident or overextrapolated in estimating firms' future performance, it can directly lead to the result that current dividend paying cannot signal positive future earnings performance. Therefore, it is reasonable to assume that managers who overextrapolate firms' future growth tend to currently initiate/increase/pay dividends or use dividends as the tool to attract investors based on dividend signalling theory.

The last, but not least, motivation for this research is that there is limitation in the applicability of some previous managerial behavioral factors in explaining corporate finance based on a large size of sample. Most previous literature on managerial optimism (confidence) and information content of dividends have only limited size of observations. They mostly focus on large firms or firms with observable past long-term performance (e.g. Malmendier and Tate, 2005; Malmendier and Tate, 2008; DeAngelo et al., 1996; Koch and Sun, 2004), but other literature on dividend payers' characteristics have much larger sizes of observations (e.g. Fama and French, 2001; Baker and Wurgler, 2004a; Hoberg and Prabhala, 2009). A wide applicable proxy for managerial behavioral factor is valuable in connecting most conventional factors and behavioral factors together in one model.

1.4. Contribution to the literature

This research contributes to the literature in several ways. Compared with previous literature, this thesis is the first to argue that managers could extrapolate past earnings' patterns into the future, and this overextrapolation may lead to wrong dividend decisions of "pay too much" or "cut too early". Our hypothesis of managerial overreaction is related with Roll (1986)'s discussion on managerial hubris, Malmendier, Tate, and Yan (2011)'s examination on managers' traits. This thesis also links managerial overextrapolation with psychology theory that individuals may overestimate the representativeness of limited samples and then blindly believe that the limited samples they observed can represent other samples (also called "rule of thumb") ((Kahneman and Tversky, 1974), and psychology theory that individuals tend to make decisions based on their past experiences (Jullisson, Karlsson, and Garling, 2005). Based on the assumption that managers tend to extrapolate past growing earnings into the future, we link managerial overextrapolation with firms' dividend decisions.

This thesis also makes several contributions to the previous literature of empirical studies. The first empirical study in Chapter 3 discusses managers' extrapolation on firms' future earnings performances which lead to managers' uses of dividends as a signal to attract investors, and then finds supportive evidence from the U.S. market. Chapter 3 investigates whether firms' dividend policy can be affected by managers' extrapolation, after controlling for: (1) Fama and French (2001)' firms' characteristics variables; and (2) Baker and Wurgler (2004a)'s dividend premium. Based on the FTP format of COMPUSTAT data and the same sample period, which is from 1963 to 2000 as in the research of Baker and Wurgler (2004a), Chapter 3 uses the same Fama-Macbeth logistic regression method as both Fama and French (2001) and Baker and Wurgler (2004a) use for ruling out the impact of fundamental factors on firms' decisions of being dividend payers (Hoberg and Prabhala, 2009) or being new dividend payers (Baker and Wurgler, 2004a). It also allows a direct comparison between the results of this research and the results of previous most relevant research as well as a comparison between the impact of investor' behavioral biases (dividend premium of Baker and Wurgler (2004a)) and the impact of managerial behavioral biases (overextrapolation).

After bringing managerial behavioral biases into conventional models in investigating determinants of firms' payout policy, this research also discusses whether dividend payers or new-payers' extrapolation activity is 'overextrapolation' on the prospect of future earnings growth by using simple statistics methods. The research topic on whether firms' past earnings performance can predict future earnings performance is still under debate (see Finger, 1994; Chan et al., 2003; Bradshaw et al., 2012), so it is still new and necessary to examine whether dividend payers or new-payers, who are affected by extrapolation based on past earnings growth, overreact in making dividend decisions.

The second main contribution this research makes to the literature is that Chapter 4 examines determinants of firms' payout policy in the out-of-sample period from 2001 to 2013. Chapter 4 also tests the robustness of indicators for managerial extrapolation in the larger sample period from 1963 to 2013. Since Fama and French (2001) record a sharp decline in dividend payers from 1978, most recent relevant research focuses on the discussion of disappearing dividends' causes (see Baker and Wurgler, 2004a; Baker and Wurgler, 2004b; Hoberg and Prabhala, 2009; Kuo et al., 2013). However, Julio and Ikenberry (2004) find a reverse in this decline from 2000, and they attribute this rebound to: (1) needs of firms to announce to investors that they will not waste excess cash flow; (2) signalling theory that firms pay dividends to attract investors in showing their confidence in corporate governance; and (3) tax cuts before the rebound. Julio and Ikenberry (2004) also find trial evidence that the reappearance of dividends is caused by catering requirements (Baker and Wurgler, 2004a). We find empirical evidence in Chapter 4 that the percentage of dividend payers increased from 2002 to 2013 with moderate fluctuation. After investigating regressions' results based on the sample period 2001 to 2013, we find that the reappearance of dividends is caused by increases in the percentage of firms who experienced earnings growth over the past few years rather than the catering factor (dividend premium). This finding is partly consist with the argument of Julio and Ikenberry (2004) on determinants of reappearing dividends.

Compared with most previous literature which ends its testing period around 2004, Chapter 4 provides supportive evidence to this thesis' main hypothesis that firms' dividend policy can be affected by one form of managerial behaviour bias – managerial extrapolation – and finds that this behaviour bias is one of the key determinants for the reappearance of dividends around 2002. In addition, Chapter 4 also contributes to the literature by investigating determinants of different dividend policy including dividend initiation, continuation, increase, payment, omission, and decrease in a larger sample period from 1963 to 2013 as well as in the out-of-sample period from 2001 to 2013, and finds evidence that the explanatory power of indicators of managerial extrapolation is significant and robust.

This thesis makes the third main contribution to the literature by running a 'horse race' among varying definitions of managerial behaviour factors which are claimed to affect firms' dividend policy by previous literature. In previous literature, dividend premium (Bake and Wurgler, 2004a) reflects managers' catering incentive to investors' behaviour biases. It does not represent managers' behaviour biases, but it is a manager's rational behaviour after responding to investors' behaviour biases, and it can be one of the behaviour factors rather than a fundamental factor for managers to make dividend decisions. On the other hand, managerial overconfidence is also argued to play an essential role in affecting firms' payout policy (see

Ben-David et al., 2007; Cordeiro, 2009; Wu and Liu, 2011; Deshmukh et al., 2013). Compared with managerial overconfidence calculated by using varying methods (see Malmendier and Tate, 2005; Malmendier and Tate, 2008, Campbell et al., 2011), managerial extrapolation may have connection with but is different from managerial overconfidence, given that managerial overconfidence and managerial extrapolation both belong to the definition of managerial overreaction. However, previous literature does not compare among these factors representing different managerial behaviour activities in explaining firms' dividend policy. Therefore, Chapter 5 of this thesis contributes to the literature by comparing these factors representing different managerial behaviour activities, and finds that indicators of managerial extrapolation have consistent impact on varying firms' dividend decisions (dividend initiation, continuation, increase, payment, omission, and decrease). In addition, Chapter 5 tests two alternative measurements of managerial extrapolation – by using sales or free cash flow to replace earnings per share (EPS) informing indicators of managerial extrapolation, and finds sales or free cash flow show similar results as results by using EPS to form indicators of managerial extrapolation.

1.5. Research questions

Chapter 3 launches the main research question of whether a firms' growing/declining profitability over the past three to five years can affect managers' decision to pay dividends. Given other conventional determinants of dividend policy, Chapter 3 argues that managers tend to make dividend decisions by extrapolating future earnings performance based on past growing/declining profitability. Based on the main argument and main research question, this thesis also answers several detailed research questions.

1. After controlling for risk factors (Hoberg and Prabhala, 2009), does dividend premium still have significant impact on dividend decisions (including propensity to initiate dividends, propensity to continue dividends, propensity to increase dividends, changes in propensity to pay dividends, propensity to omit dividends, and propensity to decrease dividends)?

2. Are firms who initiate/continue/increase/pay dividends over optimistic in extrapolating their firms' future earnings performance (overextrapolation)?

3. Are firms who omit/decrease dividends over pessimistic in extrapolating their firms' future earnings performance (overextrapolation)?

4. Is the reappearance of dividends after 2000 affected by managerial overextrapolation?

5. Do the same factors have the same impact on firms' dividend policy within the extended period from 2003 to 2012? Could the same conclusion be made based on an extended sample period from 1963 to 2012? (robustness check)

6. Is the impact of managers' overextrapolation on dividend decisions robust after considering managers' overconfidence and using different alternative proxy to represent managers' activities of extrapolation (e.g. extrapolation based on sales and free cash flow)?

7. Can managers' overconfidence affect dividend decisions, when there is a 'horse race' among the impact of investors' behavioral biases, managers' extrapolation, and managers' overconfidence?

This thesis will only focus on dividend policy of all existing payout methods, but not discuss about share repurchase which is also one of methods to give money back to investors for two reason, because share repurchase has its unique motivations like changing firms' leverage ratio and takeover deterrence (see Dittmar, 2000) that dividend does not have. Compared with dividend policy that pay out cash flow which is expected to be ongoing, share repurchase is usually used to pay out cash flow which is temporary (Jagannathan, Stephens and Weisbach, 1999). Our hypothesis on managerial extrapolation represents managers' extrapolation of past long-term growing earnings into the future which is also a long-term expectation, so it can hardly to assume a reasonable relation between managerial extrapolation based on past long-term earnings and firms' decisions of share repurchase. In other words, it is not correct to jointly test determinants for both dividend policy and share repurchase in one regression function. Therefore, share repurchase will not be the topic we are going to discuss in this thesis.

1.6. Structure of this thesis

This thesis contains six chapters including three chapters of empirical studies. Followed by the introduction in chapter 1, Chapter 2 summarizes the literature review on both conventional fundamental determinants and behavioral determinants of payout policy. After finding the research gap in previous literature, Chapter 3 (the first empirical study) examines whether managers' extrapolation can affect firms' dividend decisions by applying the methodologies of Fama and French (2001), Baker and Wurgler (2004a), and Horberg and Probhala (2009). Chapter 3 also uses statistic tables to discuss whether payers who are extrapolating future earnings performance overestimate their future performance. With the motivation that dividends reappeared during the recent decade after a trend to disappear discussed by previous literature, Chapter 4 extends the sample period in Chapter 3 to 2013 by using out-of-sample's COMPUSTAT data (1963-2013), and then compares results from in-sample data (1963-2000) to test whether our conclusion based on in-sample data holds in the out-of-sample data. With a concern on arising issues about the impact of financial crisis on finance and economics, Chapter 4 also tries to find evidence on whether financial crisis or recession have impact on firms' dividend decisions, especially for the most recent financial crisis, and whether other determinants of dividends will be affected when financial crisis or recession are brought into the analysis. The whole of Chapter 5 plays an essential role of robustness check by using alternative proxy of managers' overextrapolation in models as well as bringing different measurements of managers' overconfidence in regressions. Chapter 6 concludes. .

CHAPTER 2 LITERATURE REVIEW

2.1. Introduction

Before the discussion about the influence of managerial overextrapolation on dividend policy, a literature review on possible determinants of dividend policy is necessary. Previous literature on payout policy's determinants includes fundamental factors like size, current profitability, and market to book ratio (M/B), as well as recent-developed determinants like life-cycle proxy, liquidity, and investors' demand on dividends (dividend premium of Baker and Wurgler, (2004a)). Some of the fundamental factors show robust significant impact on firms' dividend policy (e.g. size and profitability), while results for others are mixed in previous literature (e.g. Market-to-book ratio and dividend premium). If a new theory can be developed on the issue of dividend policy's determinants, it is necessary to control for these existing relevant factors when examining the impact of new-developed factors.

In terms of the empirical test for examining determinants of dividend policy, the Fama-Macbeth logistic regression is widely applied (see Fama and French, 2001; Baker and Wurgler, 2004a; Hoberg and Probhala, 2009; Kulchania, 2013; Kuo et al., 2013) in large size samples. Except for the dividend premium (Baker and Wurgler, 2004a), most other behavioral explanations for dividend policy focus on smaller samples (see Malmendier and Tate, 2005; Ben-David, 2007; Malmendier and Tate 2008; Deshmukh et al., 2013). Although it is still difficult to apply most explanatory variables in one empirical model about determinants of dividend policy because of data's avaliability, it is necessary to understand all main determinants of dividend decisions before this research moves to the empirical test.

This literature review chapter is divided into four parts. The first part (section 2.2) focuses on literature on conventional non-behavioral determinants of dividend policy. They not only include basic firm-specific factors like size, profitability, and M/B ratio which are discussed earlier, but also include later-developed factors like firms' life-cycle and firms' liquidity. The second part (section 2.3) introduces papers which investigate behavioral explanation of dividend policy. They include investors' behavioral biases and managers' behavioral biases. The third part (section 2.4) is a summary of models and samples used by previous relevant papers, and the last part (section 2.5) is a conclusion on the value of this research based on all literature listed in this chapter.

2.2. Fundamental determinants of dividend policy

2.2.1. Firm-specific characteristics as dividend decisions' determinants

Fama and French (2001) summarized that payers' characteristics including size, profitability, and investment opportunities could determine firms' dividend policy. After the empirical findings of Fama and French (2001) in the U.S. market, later literature finds more international evidence that firms' dividend policy is determined by fundamental factors. These main fundamental factors are listed as follows:

Size is the first determinants of firms' dividend policy. Dividend payers are found to be large firms in a wide range of literature. The impact of size on dividend decisions is widely found across different markets in varying countries (see e.g. DeAngelo et al., 2004; Eriotis, 2005; Reddy and Rath, 2006; Dennis and Osobov, 2008; Utomo, 2008; Ahmed and Javid, 2009). The size of a firm is usually calculated by using the firm's total assets, sales, or market capitalization (market equity).

Profitability is one of main fundamental factors significantly affecting firms' dividend policies. It is usually proxy by earnings before interests divided by total assets. Profitability is also a robust significant determinant of dividend decisions, as it can offer firms the necessary cash flow to pay dividends. According to Miller and Modigliani (1961), firms can barely pay dividends if there are not sufficient earnings to support firms' investment and distribution. The intense relation between profitability and dividend is supported by world-wide evidence that firms with high profitability tend to pay dividends (see e.g. Adaglu, 2000; DeAngelo et al., 2004; Omet, 2004; Reddy and Rath, 2006; Amidu and Abor, 2006; Dennis and Osobov, 2008; Ahmed and Javid, 2009).

A firm's **investment opportunity** is found to have a negative relation with the firm's dividend payment. A firm will tend to pay dividends if the external finance is costly (Myers, 1984) or agency cost exists (Jensen, 1986). Baker and Wurgler (2004a) use two measurements to proxy for firms' investment opportunity: asset growth rate and M/B ratio, when the asset growth has been discussed by Fama and French (2001) as a good proxy for firms' investment opportunities. Compared with ***size*** and ***profitability***, investment opportunities proxy by asset growth or M/B ratio cannot provide robust significant impact on managers' dividend decisions (see e.g. Fama and French, 2001; Baker and Wurgler, 2004a; DeAngelo et al., 2004; Amidu and Abor, 2006; Denis and Osobov, 2008; Ahmad and Wardani, 2014).

Leverage is also a conventional fundamental determinant of dividend policy. A firm's financial leverage exhibits the way the firm finances itself, and leverage can also reflect the ability that the firm has to meet its obligation. Leverage can be a proxy of a firm's financial risk. In previous literature, firms' financial leverage is usually evaluated as the ratio of total debt on total asset or the ratio of total liability to total book equity. Several previous papers have discussions on the relation between dividend policy and leverage, and find cross-country empirical evidence (see e.g. Baker et al., 2001; DeAngelo et al., 2006; Naceur et al., 2006; Ahmed and Javid, 2009; Ahmad and Wardani, 2014).

2.2.2. Life-cycle theory, and liquidity as dividend decisions' determinants

The life-cycle theory is developed later than early fundamental dividend-determining factors like size, profitability, and asset growth. Life-cycle theory claims that young firms can encounter more investment opportunities than can be covered by internal finance, and they tend to preserve free cash flow for future investment rather than paying out to investors. When firms become more mature and more competitors enter the market, they cannot find sufficient projects with positive NPV, and they tend to distribute profits for avoiding high cost of retention.

Life-cycle theory is widely supported by empirical studies. Fama and French (2001) find that dividend paying firms are usually large ones with low asset growth rate, and the sharp decrease in the number of dividend payers may be affected by the rise of young firms from 1978 in the U.S. market. Grullon et al. (2002) also find that firms with reducing capital expenditures tend to increase dividends. The slowdown of capital expenditures means that the firm moves into a stage with limited investment opportunities and becomes mature after fast growth. Julio and Ikenberry (2004) test the maturity hypothesis by averaging estimators from results of cross-section logistic regression for each quarter to get the model's forecast, and variables age is used in these regressions to proxy for firms' maturity. Firms' retained earnings on total equity (RE/TE) and retained earnings on total asset

(RE/TA) are used as the proxy for firms' maturity by DeAngelo et al. (2006). DeAngelo et al. (2006) find that these two life-cycle variables have significant impact on firms' propensity to pay dividends. In the work of DeAngelo et al. (2006), the life-cycle stage of firms (RE/TE or RE/TA) was also found to have the most significant impact on firms' decision of initiating and omitting dividends. Denis and Osobov (2008) extended the evidence of DeAngelo et al. (2006) of life-cycle theory in firms' dividend policy to world-wide level to include the Canadian, British, German, French, and Japanese markets. The explanatory power of firms' maturity (calculated as RE/BE) is even more significant in research at the international level. By re-defining dividend initiators as firms who pay dividends for the first time since its IPO, Bulan et al. (2007) find that capital expenditures to total asset ratio (a proxy of firms' maturity) is positively affecting firms' decisions of being initiators. Different from previous research, Bulan et al. (2007) comprehensively test the differenced or lagged/leading form of other factors like size, M/B ratio, and profitability (ROA), and find that the life-cycle factor's impact on initiation decisions is robust.

Liquidity is another factor found to affect firms' dividend policy. Banerjee et al. (2007) claim that firms' liquidity could have impacts on dividends decisions, because investors may have higher expectation of high-liquidity firms' value than low-liquidity firms' value in a market with fractions, and firms with low liquidities may also tend to pay dividends for the purpose of increasing their valuation. Kuo et al. (2013) summarize main liquidity ratios which can be used to proxy firms' liquidities, and then find international support from different countries. Four main liquidity ratios used by them (Kuo et al., 2013) are turnover ratio (TUN), illiquidity ratio (ILLIQ) introduced by Amihud (2002), relative bid-ask spread (PS) put forward by Amihud and Mendelson (1986), and liquidity measure (LM) by Liu (2006). Kuo et al. (2013) apply these liquidity ratios in the Fama-Macbeth logistic regression used by Baker and Wurgler (2004a) and Hoberg and Prabhala (2009), and find that TUN is the optimal proxy of liquidity from international level evidence.

2.2.3. Historical long-term earnings performance and firms' dividend decisions

It is interesting to find that prior literature mainly focuses on the current effects of factors on dividend decisions, and the impact from past value of determinants is only investigated within a short-term period (e.g. Daniel, Hirshleifer, and Subrahmanyam, 1998; DeAngelo et al., 2006; Bulan et al., 2007; Kulchania, 2013). It suggests that the long-term effect of factors on dividend decisions could be a gap which needs to be filled, although the historical long-term pattern of earnings and dividends has been considered in prior analysis on the topic of dividend changes' information content (e.g. DeAngelo et al., 1992; Charitou, 2000; Koch and Sun, 2004; and Charitou et al., 2010).

The reason why profitability may be more important than other determinants is not only argued by Miller and Modigliani (1961) – in that profitability is the only limitation in determining the trade-off between investment and distribution – but is also discussed by several previous studies in that earnings stability, persistence of earnings' growth rate, or expected future earnings are key determinants of firms' dividend decisions (see e.g. Pruitt and Gitman, 1991; Veit, and Powell, 2001; Brav et al., 2005). Therefore, profitability combined with its long-term performance, which reflects the stability, persistence, or future expectation of earnings, should be an important factor in affecting dividend decisions. However, no paper directly mentions forming a variable representing firms' long-term earnings performance. Long-term profitability is only used as a criterion to selecting samples in some previous literature (see e.g. DeAngelo et al., 1992; Charitou, 2000; Koch and Sun, 2004; Charitou et al., 2010).

The historical long-term earnings' effect on dividend is only mentioned by a few papers. The paper by Campbell and Shiller (1988) seems to be the earliest one. As an early study which uses the VAR model to investigate the impact of long-term historical earnings on expected future dividend affected by present stock market returns, it also uses long moving average of years' earnings to forecast the present dividends as well as the present dividend growth rate, and finds that past long-term earnings do play a dominating significant role in these relations. Campbell and Shiller (1988) introduce a theoretical framework that present stock returns should reflect discounted expected future dividend, and present dividend increases are affected by past long-term earnings. Their research has two specifications: (1) their empirical analysis is based on the aggregated market level data rather than firm-year level data; and (2) only the change of dividends is analysed. DeAngelo et al. (1992) focus on dividend deduction and omission caused by firms' past long-term earnings performance: a loss in earnings during 1980-1985. The cross-section logistic regression method is employed. The loss in firms' earnings is found to be the essential but not the only condition of dividend deduction, and unusual items as the component of earnings also play important roles in dividend deduction and omission. Based on the arguments of Campbell and Shiller (1998) and DeAngelo et al. (1992), it would be reasonable to expect that there could be a statistically significant relationship between earnings' performance (historical and/or present) and managers' decisions on issuing dividends, although the reason why this relationship may exist requires further discussion. It seems that managers can still make dividend decisions based on available information including past and present earnings performance, when future earnings may not be able to be forecast precisely (e.g. a random walk (Barberis et al., 1998)).

Several other papers also only concentrate on the investigation of payers and their dividend changes, when the earnings-dividends relation is discussed. Pruitt and Gitman (1991) surveyed 1000 of the largest firms as early as 1991 when they found that historical variability of earnings and the earnings' increase rates are important factors that affect managers' dividend decisions. Baker, Veit, and Powell (2001) summarize most previous research all based on Lintner's (1956) behavioral model and survey. They also conduct a new survey on 630 payers' managers and conclude with the similar conclusion to these earlier surveys that stability of earnings is one of dominating factors influencing firms' dividend policy. Following the papers by DeAngelo et al. (1992) and Koch and Sun (2004) about past earnings changes' impacts on information content of dividends, Charitou et al. (2010) use descriptive statistics and OLS regressions to show that firms' dividend decisions can tell a good story about future earnings performance when firms have current earning reduction after long-term past positive earning patterns. In addition, dividend decisions after longer patterns of earnings have more pronounced information content than those which have shorter patterns. As a summary of literature, it is reasonable to assume that: (1) managers can notice firms' past long-term earnings performance before they make dividend decisions; furthermore, (2) a long-term earnings pattern may bring more significant impact on dividend decisions than a short-term earnings pattern could bring.

2.3. Behavioral explanation of dividend policy

2.3.1. Investors' behavioral biases: Catering theory and its counterarguments

Following the similar data sample (Fama and French, 2001), Baker and Wurgler (2004a) construct four measurements of investor sentiment for dividends to represent the investors' will to receive dividends. In the U.S. market, past non-payers tend to become dividend payers when the investor sentiment on dividends increases. On the other hand, past payers tend to omit dividends when investors do not prefer receiving dividends. As a further discussion, Baker and Wurgler (2004a) find that investor sentiment on dividends only affects firms' decisions of paying dividends or not-paying dividends, but does not affect the changes in dividends' amount. Later, Baker and Wurgler (2004b) divided the analysing time period into four parts; disappearance and re-appearance of dividend paying are found to be driven by the catering incentive (dividend premium) which is the difference between log of total dividend payers' value-weighted market-to-book ratios and log of total dividend non-payers' value-weighted market-to-book ratios. The catering theory of Baker and Wurgler (2004a) is supported by Li and Lie (2006) with empirical findings that firms' dividend change decisions and the magnitude of dividend changes are significantly related to dividend premium, and the stock market rewards managers for their correct response to investors' dividend demand which is proxy by dividend premium.

The practical evidence for catering evidence is mixed. Inconsistent with the findings of Baker and Wurgler (2004a; 2004b), Julio and Ikenberry (2004) do not find supportive evidence for the catering theory[2]. Among the three explanatory variables of Julio and Ikenberry (2004), industry dummy is mentioned as the proxy for firms' investment opportunities instead of M/B ratio, while age variable is used to represent the maturity of firms. Beside testing the life-cycle theory, Julio and Ikenberry (2004) also tested catering theory by investigating the three-day window abnormal returns surrounding the day when the initiation decision is announced, and they found that the catering theory's explanatory power becomes weaker when firms' size and age are controlled. The catering theory developed by Baker and Wurgler (2004a) was also claimed to be less important in firms' dividend decision by Denis and Osoboy (2008) through some statistical evidence (i.e. the gap between real propensity to pay and expected propensity to pay does not fluctuate as much as the dividend premium), and the life-cycle theory is found to have the most significant explanatory power in explaining firms' decision on dividend policy.

In another counterargument to the catering theory, DeAngelo et al. (2008) gave a good literature review on the behavioral influence of investors on dividend policy, and they concluded that behavioral explanatory power is limited in explaining firms' dividend decisions. By following the methodology of Baker and Wurgler (2004a), Hoberand and Prabhala (2009) found an alternative way to explain firms' decisions in being dividend payers and new dividend payers. They also found that the significant impact of investor sentiment/dividend premium disappears after firms' idiosyncratic risk is controlled. Based on the empirical results of Hoberg and Prabhala (2009), they argue that the disappearance of dividend after 1978 is driven by risk factors, and the dividend premium of Baker and Wurgler (2004a) is in fact a good proxy of risk.

[2] Julio and Ikenberry (2004)'s methodology has been shortly introduced in section 2.2.2.

However, Bulan et al. (2007) defined initiators as firms who issue dividends for the first time from their IPOs, and this definition is different from the one in the paper by Baker and Wurgler (2004a) who defined dividend initiation as new payers who were not payer the previous year. By using a new definition of dividend initiation as the dependent variable and using different three-year averaged independent variables in their regression models, the significant impact of catering factor exists after controlling other firm-specific factors including the idiosyncratic risk (Bulan et al., 2007). The influence of market sentiment (dividend premium) on dividend is robust after controlling the time trend and the proxy of life-cycle. As another recent empirical support for catering theory, Jiang et al. (2013) test the substitution effect between dividends and share repurchases. Jiang et al. (2013) divide firms' distribution methods into eleven groups which represent different combinations of payout methods, and then use multinormial logistic regression to analyse the relation between these payout methods and their possible determinants. After controlling for systematic risk and idiosyncratic risk (Hoberg and Prabhala, 2009), dividend premium (Baker and Wurgler, 2004a) still has a positive effect on dividend initiations and dividend increases.

2.3.2. Managers' behavioral biases: Overconfidence

Malmendier and Tate (2005) define overconfidence as the overestimation of one's own ability. However, in psychology literature, overconfidence includes overestimation, overplacement, and overprecision (Moore and Healy, 2008). There are several papers which tell different stories about the cause of managers' overconfidence, but there are limited methods in estimating it. Finding a suitable and specific proxy for a certain category of overconfidence is challenging. After Malmendier and Tate (2005) enlightened the literature by constructing option-holding based proxy for managers' overconfidence, and developing a press-based index of confidence, some later papers extend their (Malmendier and Tate, 2005) main idea into larger sample size (see Campbell et al., 2011; Hirshleifer et al., 2012; Ahmed and Duellman, 2013). Hilary and Menzly (2006), and Hilary and Hsu (2011) also develop the psychology theory of "better-than-average" to form the proxy for managers' overconfidence based on managers' past excellent performance. Libby and Rennekamp (2011) design an experiment to collect participants' (MBA students') miscalibration (overprecision) and dispositional optimism (overplacement). Ben-David et al. (2013) use questionnaire to collect managers' expectation on future stock market performance, and develop it to be a proxy of managers' overconfidence based on the psychological theory of 'overprecision'.

Managers are overconfident in making financial decisions. CEOs are overconfident in corporate investments (Malmendier and Tate, 2005) and in making merger and acquisition decisions ((Malmendier and Tate, 2008). After the survey by Brav et al. (2005) on motives of managers' payout policies, recent research on CEO overconfidence has begun to investigate CEOs' decisions in issuing dividends (Deshmukh et al., 2013) and repurchasing (Banerjee et al., 2013). Managers who are overconfident also tend to issue overestimated management forecasts or a higher number of management forecasts (see Hribar and Yang, 2011; Hilary and Hsu, 2011; Libby and Rennekamp, 2012).

Only a few papers discuss the relation of managers' overconfidence and firms' dividend policy. Ben-David et al. (2007) use a theoretical model to argue that an overconfident CEO in underestimating discounted rate tends to reduce dividends, although their later working paper (Ben-David et al., 2009) finds no empirical support for this relation. Wu and Liu (2011) also construct a theoretical model to claim that a CEO who overestimates the firm's future cash flow from current investment tends to increase dividends. Based on our knowledge, Deshmukh et al. (2013) published the first paper which successfully connects a theoretical model with supportive market evidence in dividend policy and CEO overconfidence. Deshmukh et al. (2013) follow the methods of Malmendier and Tate (2005, 2008) of forming option-holding-based and press-based proxy for managers' overconfidence, and then testing the relationship between managers' overconfidence and firms' dividends. Their findings support their argument that managers who believe that the external finance is costly tend to reduce dividends. In summary, different definitions of managers' overconfidence (e.g. optimism in forecasting future cash flow; optimism in believing future returns of current project) can lead to opposite results of dividend payment. The research topic about managers' overconfidence on dividend decisions can be discussed further.

2.3.3. Managers' overextrapolation on corporate decisions: a research gap in dividend decisions.

Overextrapolation is different from overconfidence in several ways in terms of its definition and application: (1) In previous literature, the definition of overconfidence is applied as the overestimation of future from the current situation (Heaton, 2002), while the definition of overextrapolation is the applied as the overestimation of future from past situation (It is also one application of overestimated representativeness on limited samples (Tversky and Kahneman, 1974) in topics of financial and economics); (2)As an important distinguish, overconfidence is about over self-assessment (overestimation and overplacement), while overextrapolation is the overestimation of a few observations' representativeness (Tversky and Kahneman, 1974); (3) overconfidence can be the form of overprecision: the over belief in the precision of information (volatility), while overextrapolation is the over belief in the average performance (mean).

Despite the difference between overconfidence and overextrapolation, it is surprising to find that literature about extrapolation in finance only focuses on investors' extrapolation activities. There is not a systematic literature review on managerial overextrapolation that can be summarized. Tversky and Kahneman (1974) and Alti and Tellock (2011) discuss individuals and agents who can extrapolate the future from past information, and these 'individuals' or 'agents' should be able to be applied in the definition of both investors and managers. Therefore, when previous literature focuses on investors' activities of extrapolation, we discover a research gap in managerial extrapolation in corporate finance.

2.3.3.1. Investors' extrapolation

It is necessary to know about theories and empirical findings of investors' extrapolation before we move to the managerial extrapolation part because investors and managers usually partly share the same publically-available information from which they may extrapolate the future. The abnormal changes and phenomena in the financial market may be attributed to the interaction of investors' behavioral bias and managers' behavioural bias including the overextrapolation activities. The well-developed literature for investors' extrapolation may enlighten the literature for managers' extrapolation in the future.

The paper by Tversky and Kahneman (1974) is the first which propose the "heuristic representativeness" theory, and proves this theory by using experimental research. Tversky and Kahneman (1974) find evidence that individuals tend to overweight the representativeness of small number observations, and overbelieve that these small number observations can represent the whole population's characteristics. The "law of small numbers" theory by Tversky and Kahneman (1974) is discussed by Hirshleifer et al. (2015) as a theory which can be applied in various aspects of economics and finance. Hirshleifer et al. (2015) posit that a possible implication of this theory is that investors may inadequately believe that a firm is growing after observing realized growth in the firm's earnings, although they do not test or try to find empirical evidence for this assumed example.

Lakonishok et al. (1994) find that glamour stocks' performance is more persistent than expected, and they try to explain this finding by arguing that investors may extrapolate firms' past performance into future performance and avoid the strategy of investing in value stocks. In the empirical findings of Lakonishok et al. (1994), earnings, cash flow, and sales are all used to represent firms' 'performance'. La Porta (1996) supports the argument of Lakonishok et al. (1994) by finding that glamour stock overpricing is caused by investors' overextrapolation from firms' performance for the past five years.

Another interesting argument is that of Avery and Chevalier (1999). They find evidence that football game gamblers' betting activities follow the betting line, although the results may be random. Based on findings from the betting market, they argue that firms' future prices may also be affected by the movement of past prices, because the football betting market has similar characteristics with the financial market.

Previous literature on investors' extrapolation is not only limited in investigating the influence of investors' extrapolation on future returns of stocks. Greenwood and Hanson (2013) find that investors also extrapolate corporate bonds' past default rate into the current default rate as well as future default probability. This extrapolating activity is one of the reasons for corporate bonds' excess returns.

Investors' extrapolation activities are not only explained by practical evidence, but also theoretical models. Barberis et al. (1998) argue that investors pay more attention to a series of good or bad news rather than earnings announcements. They construct a theoretical model which assumes that investors overcare about the strength of evidence rather than the weight of this evidence, and then cause the overreaction of firms' prices to the similar pattern of news. In other words, investors' overextrapolation based on past news can lead to misprice. In the discussion by Barberis et al. (1998), investors may believe that a regime change in earnings is rare, so investors tend to update their attitude toward a company based on past information of a firm's earnings. However, movements of earnings are assumed to follow a random walk. Therefore, an occasional stable increase in earnings could lead to the overreaction of investors who believe that earnings growth will be stable, then leading to overprice. Specifically, they simplify the type of regimes into two categories: mean-reverting regime and trending regime, and they assume that investors will form their attitude about which regime a firm is in by observing past information on earnings. Barberis and Shleifer (2003) assume that investors' views on certain stocks can be affected by the past performance of the same style stocks, and they use a theoretical model on bubble information to explain investors' activities in extrapolating a stock's future returns by using same style stocks' past information on returns.

2.3.3.2. Managers' overextrapolation and overconfidence: implications of the research by Alti and Tellock (2014)

In a recent study which distinguishes agents' overconfidence and overextrapolation, Alti and Tellock (2014) establish a theoretical model which considers the impact of firms' behaviour bias on return anomalies, and test their model empirically in the U.S. market to argue that overconfidence and/or overextrapolation can affect managers' decisions which then affect future return anomalies. They also find empirical evidence that models with firms' behaviour bias (overconfidence and/or overextrapolation) fit better than models without behaviour bias. In their paper, Alti and Tellock (2014) find that overconfident managers overbelieve soft information but ignore fundamental factors, while overextrapolative managers overbelieve the persistence of firms' profitability. Overconfident managers tend to overfocus on soft information and underevaluate the importance of real profitability and then undervalue firms' short-term prices, and overextrapolative managers tend to overprice their firms based on current information of profitability.

Alti and Tellock (2014) form both their proxies for agents' overconfidence and overextrapolation from firms' profitability. The persistence of profitability represents agents' overextrapolation, while the degree of abnormal returns relay on profitability negatively reflects agents' overconfidence. This approach indicates that managers' overconfidence and overextrapolation may at least partly come from the same source of fundamental factors, and managers' behaviour can be affected both by overconfidence and overextrapolation at the same time.

A research gap for the literature of extrapolation is the impact of extrapolation on firms' dividend policies. There is still no paper which discusses and investigates the relation between managers' extrapolation and managers' dividend decisions. As a conclusion of previous literature in this section, managers may have similar extrapolating activities as investors can have by using same publically available information. Thus, the research question on managers' overextrapolation on dividend decisions remains unanswered and was worthwhile investigating.

2.4. The covering period, sample size, and models of relevant empirical research

As a summary of previous literature on determinants of dividend policy, different models and variables setting may lead to opposite conclusions. As has been discussed in section *2.3.1*, the dividend premium of Baker and Wurgler (2004a) loses its explanatory power in the research of Hoberg and Probhala (2009) which uses Fama-Macbeth's logistic regression model, but shows robust impact in the paper by Bulan et al. (2007) which uses moral hazard model and the multinormial regression model of Jiang et al. (2013). Results may also be sensitive to investigate time period, considering the fact that there are several drops and raise of dividends since 1963

(Baker and Wurgler, 2004b). It is meaningful to discover detailed differences in previous relevant papers' model choosing, variable setting, and investigated time period, and then choose proper model(s), variables, and extended/isolated time period in this research.

Table 2.1 Key empirical research (after 2000) on determinants of dividend policy: models and main results

Literature	Explanatory factors test	Regression model	Main results
Fama and French (2001)	profitability (E/A), asset growth rate (dA/A), market to book ratio(M/B), percent of NYSE firms with the same or lower market capitalization (NYP)	Logistic regression: $\Pr\left(newpayer_{it}=1\right)=\text{logit}(a_0+a_1 NYP_{it}+a_2\frac{M}{B_{it}}+a_3\frac{dA}{A_{it}}+a_4\frac{E}{A_{it}})+u_{it}$	Firms' profitability and size is positively related with the probability of paying dividends; firms' investment opportunities and asset growth rate is negatively related with the probability of paying dividends.
Baker, Veit, and Powell (2001)	22 factors including past dividends, stability of earnings, current earnings, and expected future earnings	Questionnaire	Stability of earnings, current earnings, and future earnings are three most important determinants of dividend decisions
Julio and Ikenberry (2004)	Size (Market-cap), age, industry dummies	Logistic regression $\Pr\left(payer_{it}=1\right)=\text{logit}(\alpha_0+\alpha_1 Size_{it}+\alpha_2 Age_{it}+\sum_{j=1}^{10}\alpha_{j+3} INDUSTRY_{it})+e_{it}$	Firms' size and age have significant impact on the likelihood of paying dividends; Firms in different industries have varying likelihood of paying dividends.

Baker and Wurgler (2004a; 2004b)	NYSE market capitalization percentile (NYP), market to book (M/B), asset growth (dA/A), profitability (E/A), catering variable (dividend premium: the logarithmic difference between the value-weighted M/B ratio of payers and nonpayers)	Logistic regression, and then OLS regression $\Pr(newpayer_{it}=1)=\text{logit}(a_0+a_1NYP_{it}+a_2\frac{M}{B_{it}}+a_3\frac{dA}{A_{it}}+a_4\frac{E}{A_{it}})+u_{it}$ $PTI_{i,t}=b_0+b_1VW\ \mathrm{P}_{t-1}^{D-ND}+v_{it}$ $\Delta PTI_{i,t}=c_0+c_1VW\ \mathrm{P}_{t-1}^{D-ND}+\theta_{it}$ Propensity to continue dividends and propensity to list-pay dividends are also test.	Firms' size and profitability have robust significant effect on propensity to initiate/continue/list-pay dividends, while investment opportunity and dividend premium have significant effect on propensity to initiate/list-pay dividends.
Hoberg and Probhala (2009)	Size (NYP), Market to book (M/B), asset growth (dA/A), profitability (E/A), Idiosyncratic risk (standard deviation of residuals from the CAPM), systematic factor (standard deviation of the predicted value from the CAPM)	Logistic regression, and then OLS regression $\Pr(payer_{it}=1)=\text{logit}(d_0+d_1NYP_{it}+d_2\frac{M}{B_{it}}+d_3\frac{dA}{A_{it}}+d_4\frac{E}{A_{it}}$ $+d_5INOSYNCRATIC_{it}+d_6SYSTEMATIC_{it})+\lambda_{it}$ $PTI_{i,t}=b_0+b_1VW\ \mathrm{P}_{t-1}^{D-ND}+v_{it}$ $\Delta PTI_{i,t}=c_0+c_1VW\ \mathrm{P}_{t-1}^{D-ND}+\theta_{it}$ Propensity to initiate dividend, and propensity to change dividends are also test.	Firms' size, investment opportunities, profitability, and risk factors have robust significant effect on firms' decisions of paying/initiating dividends. The dividend premium losses its significant impact on firms' decisions of paying dividends after controlling risk factors.

Brav, Graham, Harvey, and Michaely (2005)	23 financial executives' views about payout policy	Survey and Interview	Historical level of dividends, external funds, stable and positive earnings, institutions demand on dividends, and investment opportunities are important factors which affect executives' dividend decisions.
DeAngelo, DeAngelo, and Stulz (2006)	Life-cycle variable (RE/TE), Total equity to total assets (TE/TA), Profitability (ROA), Lagged profitability (ROA in prior year), Sales growth rate (SGR), Size (NYP), Cash holdings (Cash/TA), dividends in prior year (Indicator variable)	Logistic regression $\Pr(payer_{it}=1)=\text{logit}(f_0+f_1\frac{RE}{TE}_{it}+f_2\frac{TE}{TA_{it}}+f_3ROA_{it}$ $+f_4ROA_{it-1}+f_5SGR_{it}+f_6NYP_{it}+f_7\frac{CASH}{TA_{it}}+f_8DIVID_{it-1})+\rho_{it}$	earned/contributed capital mix, leverage proxy, profitability, sales growth, size, cash holdings, and whether firms pay dividends at prior year have robust significant impact on firms' decisions to pay dividends

Bulan, Subramanian, and Tanlu (2007)	Size (ln(total asset)), profitability (ROA), sales growth rate, market to book (M/B), life-cycle variable (capital expenditures/assets), cash-holding (cash/assets), risk (Fama-French three-factor betas), catering variable (dividend premium)	Cox-proportional hazard model $\Pr\left(Init_{it}=1 \mid Init_{ix}=0 \forall x<t\right)=\exp(g_1 Asset_{it}+g_2 L\_SalesGrowth_{it}+g_3 L\_\frac{Cash}{Asset_{it}}$ $+g_4 ROA_{it}+g_5 L\_\frac{M}{B_{it}}+g_6\frac{CapitalExpend}{Asset_{it}}+g_7 L\_MarketBeta_{it}+g_8 L\_SMBBeta_{it}$ $+g_9 L\_HMLBeta_{it}+g_{10} NASDAQDummy_{it}+g_{11} IPODummy1970s_{it}+g_{12} IPODummy1980s_{it})h_0(t)$ “L_” means average over the past 3 years; Bulan et al. (2007) also test “F_” which is the average over the headed 3 years.	Firms' size, life-cycle, cash-holdings, profitabilities, investment opportunities, and dividend premium have significant impact on firms' initiation (since IPO) decisions. Firms' risk factor (market beta) does not have robust significant effect on firms' decisions of initiation.
Banerjee, Gatchev, and Spindt (2007)	Size (NYP), market to book (M/B), asset growth (dA/A), profitability (E/A), turnover ratio (TURN), traded volume in the stock (DVOL), proportion of days with zero traded volume (NOTRD), illiquidity ratio (ILLIQ)	Logistic regression $\Pr\left(payer_{it}=1\right)=\operatorname{logit}(m_0+m_1 NYP_{it}+m_2\frac{M}{B_{it}}+m_3\frac{dA}{A_{it}}+m_4\frac{E}{A_{it}}+m_5 TURN_{it})+\phi_{it}$ DVOL, ILLIQ, and NOTRD are also separately test to replace TURN.	Firms' size, investment opportunities, profitability, and alternative measurements of liquidity (TURN, ILLIQ, NOTRD, and DVOL) have robust significant effect on firms' decisions of paying dividends.

Denis and Osobov (2008)	Size (NYP), Market to book (M/B), asset growth (dA/A), profitability (E/A), life-cycle variable (RE/BE)	Logistic regression $\Pr\left(payer_{it}=1\right)=\text{logit}(n_0+n_1NYP_{it}+n_2\frac{M}{B_{it}}+n_3\frac{dA}{A_{it}}+n_4\frac{E}{A_{it}}+n_5\frac{RE}{BE_{it}})+\omega_{it}$	Dividend decisions are affected by firm size, profitability, investment opportunities, and life-cycle proxy cross 6 countries.
Deshmukh, Goel, and Howe (2013)	Stock ownership, proxies of CEO's overconfidence (Vested options, longholder), market to book (M/B), cash flow (operating income before depreciaion/assets), Sales, Size (tangible assets), CEO tenure, leverage	Random-effect tobit regression $\frac{Divid}{MV_{it}}=tobit(p_0+p_1Ownership_{it}+p_2VestedOptions_{it}$ $+p_3Longholder_{it}+p_4\frac{M}{B_{it}}+p_5CashFlow_{it}+p_6Sales$ $+p_7Size+p_8CEOtenure+p_9Leverage)+u_{it}$ CEO’s detailed activities in holding vested but un-exercised options are also test as “post-longholder” and “pre-longholder”[3].	Firms' stock ownership, investment opportunities, size, and leverage have robust significant effect on firms' level of dividends.

3 According to Deshmukh et al. (2013): “Longholder is a binary variable that equals 1 if the CEO held an option package until the last year before expiration at least once during his/her tenure and the option package held was at least 40% in the money entering its final year. Post-Longholder is a binary variable that equals 1 for all CEO-years after the CEO, for the first time, holds the option package until expiration. Pre-Longholder is a binary variable that equals 1 for CEO-years where Post-Longholder equals 0 and Longholder equals 1.”

Table 2.1 introduces the explanatory variables, key models, and main findings of the main literature after the year 2000 on determinants of dividend policy. Most papers, which investigate firms' dividend decisions of paying or nonpaying dividends, follow the Fama and French (2001) format in regression function. Among them, Baker and Wurgler (2004a; 2004b), and Hoberg and Prabhala (2009) use the same Fama-Macbeth logistic regression technique as Fama and French (2001), while others use simple logistic regression except Bulan et al. (2007), who choose to use the Cox-proportional Hazard Model. As the research on dividend levels, Deshmukh et al. (2013) use the random-effect tobit regression technique instead of the logistic technique. Baker et al. (2001) and Brav et al. (2005) use questionnaire or interview to look deep into similar research questions. As a summary of Table 2.1, it is better to use logistic technique for research on dividend decisions of pay or nonpay, and Fama-Macbeth logistic regression is suggested for large data set, and for research on non-fundamental behavioral factors.

As a summary of Table 2.1, previous literature widely use logistic technique for research on decisions of paying dividends or non-paying dividends. Specificly, Fama-Macbeth logistic regression is suggested for large data set where large number of firms and long time length are included. As Goyal (2012) points out, Fama-Macbeth have its absolute advantage in dealing with unbalanced panel data. The use of Fama-Macbeth method in our selected data also allow us to use the technic of Neway-West correction and get standard errors robust to heteroskedasticity as mentioned by Baker and Wurgler (2004a). Therefore, Fama-Macbeth logistic method is the optimal method for this thesis in terms of characteristics of our data (thousands of firms with unbalanced number for each year and cross around fifty years).

Table 2.2 Key empirical research (after 2000) on determinants of dividend policy: sample size and sample period

Literature	Sample size	Sample period
Fama and French (2001)	3679 for CRSP firms; 2919 for COMPUSTAT firms	1963-1998
Baker, Veit, and Powell (2001)	188 usable responses from 630 firms	1999
Julio and Ikenberry (2004)	12073 nonutility and nonfinancial firms in total	1984-2003
Baker and Wurgler (2004a; 2004b)	All U.S. firms for nonfinancial and nonutility industries in CRSP and COMPUSTAT	1963-2000
Hoberg and Probhala (2009)	All U.S. firms for nonfinancial and nonutility industries in CRSP and COMPUSTAT	1962-2004
Brav, Graham, Harvey, and Michaely (2005)	384 for survey and 23 for interview	At the beginning of 21st century
DeAngelo, DeAngelo, and Stulz (2006)	All U.S. firms for nonfinancial and nonutility industries in CRSP and COMPUSTAT	1973-2002
Bulan, Subramanian, and Tanlu (2007)	2333 firms from IPO	1963-2001
Banerjee, Gatchev, and Spindt (2007)	All U.S. firms for nonfinancial and nonutility industries in CRSP and COMPUSTAT	1963-2003
Denis and Osobov (2008)	All U.S., Canadian, UK, Germany, French, and Japanese firms for nonfinancial and nonutility industries in Worldscope	1989-2002

Table 2.2 summarizes the research sample size and sample period for literature in Table 2.1. It is not hard to find that the methodology of questionnaire or interview limits the sample size to a smaller range than research with second-hand data. Besides, the sample periods for these literatures are all before 2004 when the COMPUSTAT changed its data format from FTP to XPF. It implies that a comparison between conclusion from FTP data format and XPF data format may be valuable, especially when the XPF format of COMPUSTAT data not only extends the time period to recent years, but also covers the time period of the FTP format of COMPUSTAT data.

2.5. Conclusion

This section summarizes relevant literature on determinants of dividend policy in an order from conventional fundamental factors to behavioral factors. After Fama and French (2001) launch a good example of discussing which factors can affect firms' payout policy, Baker and Wurgler (2004a; 2004b), and Hoberg and Prabhala (2009) follow regression modelling technique of Fama and French (2001) to bring in catering factor and risk factors separately. By using a simple logistic regression method, some other papers, such as Julio and Ikenberry (2004), DeAngelo et al. (2006), Banerjee et al. (2007), and Denis and Osobov (2008), also bring to this literature other explanatory factors for dividend decisions. In condition of giving up large sample size, several studies, such as Baker et al. (2001) and Brav et al. (2005), focus on a small number of firms, but have clearer and more detailed investigation on this research topic.

Although behavioral factors in explaining dividend decisions exhibit mixed results, we can hardly completely rule out the impact from behavioral factors on firms' dividend policy. It is necessary to discuss more than what can be found in current literature, because different design of variables, different modelling technique, and different time period may even lead to opposite conclusions (see Baker and Wurgler, 2004a; Hoberg and Prabhala, 2009; Bulan et al., 2007). However, it is also necessary to be more careful in discovering the world of dividend policy's determinants, because sometimes designed behavioral explanations can be "contaminated" by neo-classical factors as Hoberg and Prabhala (2009) have argued. The sensitivity of explanatory factors on the model design and sample selection is another good reason to dig into this topic further. Based on the analysis in previous literature, a ‘suit-your-case’ methodology is suggested in the model-using on this topic, and it seems better to cover as large a sample size as possible.

This literature review section opens the door on a previously undiscovered explanation for dividend decisions: managerial extrapolation. When investor-related behavioral factors like catering factor have been widely discussed and applied, and manager-related behavioural factors like managers’ overconfidence have been developed well, the seat for managerial extrapolation in the research topic of dividend policy’s determinants is still empty. Previous literature has built a solid foundation for explanatory power of extrapolation in corporate finance’s other aspects rather than distribution policy. It can be extended to the area of dividend policy as well..

CHAPTER 3 PROFITABILITY CHANGE PERSISTENCE, MANAGERIAL OVERREACTION, AND DIVIDEND POLICY

---- an in-sample test from 1963 to 2000

3.1. Introduction

Existing research argues that current profitability has impact on firms' dividend policy after controlling for firms' characteristics like size and market to book ratio (e.g. Fama and French, 2001). Managers whose firms have positive profits must decide how to use their firms' earnings: either distribute to investors or re-invest to capture investment opportunities. If a firm's positive profitability keeps growing, it can create high intensity for managers to pay part of the earnings to investors, because the firm's cash holdings are increasing with the growth of profits. Managers tend to initiate dividends when they are facing large cash holdings but few investment opportunities (Holder, Langrehr, and Hexter, 1998). In previous literature, rational managers tend to pay dividends when they expect excellent future earnings performance (Baker, Farrelly, and Edelman, 1972), because they may want to convey information to investors that their firms are going to perform well in the future (Miller and Rock, 1985). On the other hand, rational managers may also reckon investors' demand on dividends, and cater to such demand of investors (Baker and Wurgler, 2004a; Baker and Wurgler, 2004b). Previous literature also discusses the tax clientele effect and investors' behavioral factors on firms' dividend decisions (Shefrin and Statman, 1984). A firm's final dividend decision seems to be the result of a balance among fundamental factors like the firm's size and current profitability, investors' demand on dividends, and managers' prospects of firms' future profitability.

In this chapter, we discuss managers' rationality in making dividend decisions from a different view on managers' prospect of firms' future profitability. This chapter argues that managers tend to extrapolate firms' past earnings growth, which may have lasted for three or five years, into the future. Imagine the situation that managers have observed past growing earnings for their firms; their optimism in firms' future growth in profitability may also increase by overestimating the representativeness of this earnings growth. These managers may overextrapolate the past growing profitability into the future, given that future earnings growth is not certain[4]. Therefore, these overreacting managers may try to: (i) issue dividends because they believe that they will have sufficient earnings to support paying dividends, and also (ii) use dividend payouts as the signal to convince investors that they have strong belief to fulfil the commitment in bringing investors large payouts in the future according to the dividend signalling theory (Miller and Rock, 1985).

To address the question of whether managers can overreact in extrapolating past earnings growth into the future, and then make dividend decisions based on such beliefs, we ask two main research questions in this chapter:

(a) Does firms' earnings growth over the past three or five years affect the managers' decisions of initiating/continuing/increasing/paying dividends, or does firms' earnings decline over the past three or five years affect the managers' decisions of omitting/decreasing dividends?

[4] There is little support from previous literature for persistence in firm profitability. For example, Chan et al. (2003) find little evidence that firms' profitability growth rates are persistent. In terms of the earnings' levels, the conclusions on whether past earnings levels can predict future earnings levels are mixed at best (see, Kothari, 2001; Bradshaw et al., 2012).

(b) Do firms who experience growing earnings over the past three or five years and then initiate/continue/increase/pay dividends exhibit non-growing earnings in the future five years, or do firms who experience declining earnings over the past three or five years and then omit/decrease dividends exhibit non-decreasing earnings in the future five years?

By trying to answer these two questions we can also re-examine other determinants of dividend decisions. After jointly testing firms' growing profitability over the past three or five years with other conventional determinants, we can make an in-depth interpretation of significance and robustness of conventional factors and past growing/declining earnings' impact on managers' decisions in initiating/continuing/increasing/paying/omitting /decreasing dividends.

We propose this theory of managerial overreaction based on the theory of representativeness heuristic by Tversky and Kahneman (1974), which claims that people may overestimate their ability in predicting the possibility of an event. Overreaction is derived from the violation of Bayes' rule (De Bondt and Thale, 1985), and is examined by many empirical studies (see, e.g., Grether, 1980; Williams, 1938; Shiller, 1979). In addition, Psychology studies propose that people tend to make decisions based on past experience (Jullisson, Karlsson, and Gärling, 2005). We argue that overreacted managers may overestimate the likelihood of firms' future growing profitability by overestimating past growing profitability's representativeness, and then overextrapolate past earnings growth/decline into the future. If the pattern in a firm's past earnings growth/decline affects the manager's belief about future firm profitability, managers in firms with growing/declining past earnings patterns may overreact to the stream of past increasing/decreasing profitability and wrongly believe that increasing/decreasing profitability can last for a longer time in the future, and then make decisions to initiate/continue/increase/pay dividends or to omit/decrease dividends.

For connecting managers' extrapolation on future earnings with managers' current decisions on payout policy, we need to go back to the discussion of managers' incentives to pay dividends. There are severalconventional theories and hypothesis on the reason why managers pay dividends including dividend irrelevant theory (Modigliani and Miller, 1958, 1961), taxation (Brennan, 1970), signalling theory (Modigliani and Miller, 1961), agency theory (Easterbrook, 1984) Bird-in-Hand theory (Gordon, 1959), and clientele effect (Litzenberger and Ramasawmy, 1979). Among them, the dividend irrelevant theory, agency theory, and signalling theory could have direct relation with managers' expectation about firms' future growing earnings. Miller and Modigliani (1961) claim that dividend is only the residual of earnings after firms' investment through dividend irrelevant theory. However, Lintner (1956)'s paper finds empirical evidence that managers usually try to keep dividend payout ratio stable in the long-run after deciding to pay dividends, which means that real dividends are sticky and not only the residual after making investment decisions.Agency theory indicates that managers may use dividends as a tool to convert information to investors, when asymmetric information exists. Therefore, firms tend to pay dividends, if (1) managers believe that there will be good earnings performance (e.g. growing earnings) in the future, or (2) managers would like to use dividend as a signal to attract investors.

On the other hand, managers tend to believe that firms will also have growing profitability in the future, if they observe the past growing earnings and over-estimate the representativeness of the past growing earnings. If managers over-believe in future earnings' growth based on past growing earnings (overextrapolation), they may pay too much or initiate too early in dividends. It does not matter whether dividend-paying decisions are triggered by over-believing sufficient earnings given firms' investment opportunities (dividend irrelevant theory), or by the intensive of using dividends to convert information to investors and attract them. Managers who overextrapolate past growing earnings into the future could choose to initiate/continue/increase/pay dividends, and then suffer by maintaining dividends. On the opposite, managers who overextrapolate past declining earnings into the future may cut too early in dividends. In summary, the mechanism that overextrapolated managers tend to pay too much or cut too early can be explained by any dividend-paying theory that connects expected future earnings performance with current dividend decisions.

The main predictions of our theory are that firms with growing profitability over the past three or five years will: (i) initiate/continue/increase/pay dividends, and will (ii) not have continuous increasing profitability in the future. On the other hand, firms with declining profitability over the past three or five years will: (i) omit/decrease dividends, and will (ii) not have continuous decreasing profitability in the future. To test the predictions of our theory on managerial overreaction, we first focus on firms’ decisions of initiating dividends given the condition that firms were non-payers in the last fiscal year, or continuing dividends given the condition that firms were dividend payers in the last fiscal year (as Baker and Wurgler, 2004a). Then we test firms’ decisions of increasing dividend given that firms were dividend payers in the last fiscal year (as per Li and Lie, 2006). Next, we discuss firms’ decisions of paying dividends despite the condition of whether or not firms were dividend payers in the last fiscal year (as per Hoberg and Prabhala, 2009). We test determinants of these dividend decisions by running regressions of indicators for firms' dividend policy on conventional factors to get firms' propensity to initiate/continue/increase/pay dividends (see Fama and French (2001) as the example of regression models' constructing), then we test whether the proxy for managerial overreaction (overextrapolation) can explain firms' propensity to initiate/continue/increase/pay dividends, after controlling for catering factors developed by Baker and Wurgler (2004a). On the other hand, we use the same methodology to test whether managerial extrapolation of past declining earnings into the future can explain firms' propensity to omit/decrease dividends.

In detail, we use firms' growth in earnings per share (EPS) over the past three or five years to proxy for managers' overreaction reflected by managers' activities of extrapolating past earnings growth/decline into the future. Firms' patterns of past growing EPS are defined under two definitions: year-on-year (YoY) growth in EPS over the past three or five years; total (general) growth in EPS over the past three or five years. Before testing the explanatory power of firms' growing profitability over past three or five years on managers' dividend decisions, We first estimate firms' *propensity to initiate* dividends, *propensity to continue* dividends, *propensity to increase* dividends, and *propensity to pay* dividends, by regressing firms' status of initiating/continuing/increasing/paying dividends on conventional determinants as in Baker and Wurgler (2004a), Li and Lie (2006), and Hoberg and Prabhala (2009). We then jointly test impact of firms' past growing/declining EPS and catering factor on firms' propensity to initiate/continue/increase/pay dividends.

We find that managers' propensity to initiate/continue/increase dividends (as in Fama and French (2001) Baker and Wurgler (2004a), and Li and Lie (2006)) and changes in propensity to pay dividends (as in Hoberg and Prabhala, 2009) are positively related to their beliefs that positive past long-term earnings growth can last for longer in the future. In contrast, catering factor proxy by dividend premium does not have significant impact on changes in firms' *propensity to pay*. Risk, specifically the systematic risk factor (see Hoberg and Prabhala (2009)) does not have robust significant effect on firms' dividend decisions in the robustness check.

As a further finding, firms that decide to initiate/continue/increase/pay dividends do not have constant increasing earnings in the future five years. For firms who decide to pay/increase dividends, they even have decreasing profitability in the future five years. This finding provides further evidence that managers who extrapolate past growing/declining profitability into the future overreact.

We then analyse determinants of 'pessimistic' dividend decisions including dividend omission and dividend decrease as the opposite to decisions of initiating/continuing/increasing/paying dividends. If the theory of managerial overreaction holds, managerial overreaction may also be found among managers who extrapolate past decreasing profitability into the future, because managers may overestimate the representativeness of past decreasing profitability. We find that decreasing EPS over the past three or five years can affect managers' decisions of omitting dividends or reducing dividends, given other conventional determinants and catering factor, and firms who choose to omit/decrease dividends after observing past declining EPS do not have consistent decreasing profitability in the future five years.

Finally, we test the robustness of managerial overreaction's impact on dividend decisions by using alternative dependent variables and different time periods in regression functions. The robustness check provides evidence that significant impact of managerial overreaction on dividend decisions is robust compared with the impact of catering factor.

The theory of managerial overextrapolation provides a new view in understanding corporate finance. The empirical evidence in this chapter shows that indicators of managerial overextrapolation has significant effects on firms' payout policy, after controlling for other dividend-relevant factors. These findings are crucial for investors in the financial market, especially for institutional investors like pension funds that demand stable cash inflow from their investment projects. An overestimation on firms managed by overreacting managers may bring these investors declining future income, while an underestimation on firms managed by overreacting managers can imply missing potential profitable investment opportunities for investors. Theory and findings in this chapter can also help regulators formulate proper policy in regulating corporate payout as well as protecting investors.

The rest of Chapter 3 is organised as follows. Section 3.2 discusses the motivation and hypothesis of this chapter. We explain the data and variables in section 3.3. Section 3.4 introduces the logistic regression models we use to test relations between dividend decisions and their determinants. Section 3.5 discusses regression results, and then tests whether managers overreacted in extrapolating future earnings performance. Further robustness checks for the theory of managerial overextrapolation are also included in section 3.5. Finally, section 3.6 concludes.

3.2. Motivation and hypotheses

My theory of managerial extrapolation is different from other research related to managerial overconfidence on corporate financial decisions. For example, Malmendier and Tate (2005) develop a theory that managerial overconfidence is an important factor of corporate investment decisions. They analyse 477 large U.S. firms and find that CEOs who show their overconfidence either through the holding time to exercise options or through habitual acquisitions of company stocks tend to overestimate future returns of their investment projects, and tend to overinvest when their firms have sufficient funds. Malmendier and Tate (2008) extend their theory of overconfident CEOs to the area of mergers and acquisitions. They find that overconfident CEOs of acquirers tend to overestimate the value of target firms and invest in value-destroying M&A projects. Gervais, Heaton, and Odean (2011) find that overconfident CEOs are more attractive than conservative CEOs to firms, and overconfident CEOs are more willing to take risky projects because the flatter compensation offered by firms encourages them to do so. Deshmukh, Goel, and Howe (2013) find that CEOs who are overconfident tend to overbelieve that external finance is more costly than internal finance, so they tend to finance their firms' projects internally by lowering current dividends.

This research contributes to the literature in corporate payout policy by providing a new behavioral view to analyse determinants of dividend decisions, and shedding light on the behaviour of firm managers. In this chapter, we propose the theory that managers may systematically make wrong decisions by overestimating firms' future growth/decline in profitability. Different from the work of Baker and Wurgler (2004a;2004b), which investigates rational managers' catering activities in satisfying investors' demand on dividends, we relax the assumption of rational managers and discuss overreacted managers' activities in overextrapolating past growing/declining profitability into the future. Our study about managerial overextrapolation is also different from those studies which claim that managers are overconfident about their own abilities (see Billett and Qian, 2008).

The overreaction of managers in our setting is derived from managers extrapolating past success in earnings increases into the future. Thus, the first testable hypothesis in this chapter is:

Hypothesis 1 (H1): *Firms that experience past growing EPS over the past three or five years tend to initiate dividends, continue dividends, increase dividends, or pay dividends, while firms that experience past declining EPS over the past three or five years tend to omit dividends, or decrease dividends.*

If firms extrapolate past EPS growth/decline pattern into the future, even though the future earnings performance is uncertain, managers in these firms can overreact, and make wrong dividend decisions.

Hypothesis 2 (H2): *Dividend initiating/continuing/increasing/paying firms that experience EPS growth over the past three or five years will not show future EPS growth, while dividend omitting/decreasing firms that experience EPS decline over the past three or five years will not show future EPS decline.*

The extant research provides evidence on the relation between firms' current profitability (see Fama and French, 2001; Baker and Wurgler, 2004a; Hoberg and Prabhala, 2009) or firms' past profitability (see Benartzi et al., 1997; Bulan et al., 2007) and dividend policy. My research is the first to analyse whether firms extrapolate certain past long-term earnings pattern into the future and hence make decisions on dividend policy.

In terms of the motivation of dividends, dividends are usually paid to investors as permanent earnings when good future earnings are expected (Dittmar and Dittmar, 2004)). Managers tend to pay dividends when they are expecting excellent future earnings performance (Baker et al., 1972). The signalling theory posits that a firm may use dividends to convey optimistic information to investors on future profitability (e.g., Bhattacharya 1979). It is also well documented that firms prefer to keep their earnings stable (Mikhail et al., 2003) for benefits like rewards by the market in the form of excess returns (Benartzi et al., 1997; Barth et al., 1999). Thus, a continuing stable good earnings performance is expected to be followed by an established good past earnings pattern (Chan et al., 2003), although other previous literature finds limited support for this.

3.3. Data and sample

3.3.1. Data

Our sample covers all NYSE, AMEX, and NASDAQ firms in COMPUSTAT from fiscal year 1963 to 2000. This sample coverage allows us to compare with the findings of Fama and French (2001) and Baker and Wurgler (2004a). The data of the number of shares outstanding, monthly and daily returns and prices of common stocks are from the Center for Research in Security Price (CRSP). All firm-level financial data are from COMPUSTAT.

Following the sample constructions of Fama and French (2001), Baker and Wurgler (2004a), and Hoberg and Prabhala (2009), the sample includes firms that have the following Compustat data available: total assets (DATA6), stock price (DATA199) and shares outstanding (DATA25) at the end of the fiscal year, income before extraordinary items (DATA18), interest expense (DATA15), [cash] dividends per share by ex-date (DATA26), preferred dividends (DATA19), and (a) preferred stock liquidating value (DATA10), (b) preferred stock redemption value (DATA56), or (c) preferred stock carrying value (DATA130). Firms must also have (a) stockholders' equity (DATA216), (b) liabilities (DATA181), or (c) common equity (DATA60) and preferred stock par value (DATA130).

Total assets must be available at fiscal years t and $t-1$. The other items must be available at t. We exclude firms with book equity below \$250,000 or assets below \$500,000. The COMPUSTAT sample includes only firms with CRSP share codes of 10 or 11. In addition, we use only the fiscal year a firm is in the CRSP database at its fiscal year end. Utilities firms (SIC codes 4900 to 4949) and financial firms (SIC codes 6000 to 6999) are excluded from the sample.

There are total 603119 firm-year observations in the original FTP format COMPUSTAT file from 1963 to 2000. After the selection criteria introduced above, there are 110607 satisfied firm-year observations left and go into the regression analysis. Except our indicators of managerial overextrapolation, the summary statistics for other main variables used in regressions are present in Table 3.1

(change number of other tables). All definitions for these variables can be found at Appendix 3.1.

Table 3.1 Descriptive statistics, 1963-2000

Variables	N	Mean	Std Dev	Min	Max
NYP	110607	0.28	0.30	0.00	1.00
E/A	110607	0.02	0.23	-14.70	2.42
M/B	110607	1.74	2.11	0.12	137.18
ΔA/A	96431	0.07	0.28	-17.65	0.99
sys risk	93817	0.03	0.02	0.00	0.74
idi risk	93817	0.01	0.01	0.00	0.07

3.3.2. Firms' past growing earnings and dividend decisions

Fama and French (2001) record a decline of dividend payers from 1978 to 1999, and Julio and Ikenberry (2004) find that dividend payers re-appear after 2000. Panel A of Table 1 lists total numbers of *Payer*, Newpayer, and Divincrease. The number of *Payer* and *Newpayer* peaked in 1977 and 1976, respectively. Meanwhile, the number of *Payer* and *Newpayer* both reached a historical low in 2000. These patterns are consistent with Fama and French (2001), who document a decline of dividend payers from 1978 to 1999, and those reported by Julio and Ikenberry (2004). The number of firms who increased dividends also shows the same pattern of increase and decline. For firms with past EPS growth, their total number peaked around 1978, and dropped to a low around 2000, roughly corresponding to the peaks and troughs of Payer, Newpayer, and Divincrease.

Table 3.2 Measures of dividend payment and past earnings growth/decline, 1963 to 2000

Table 3.2's Panel A reports the numbers of *Payers*, *Newpayers*, *Nonpayers*, and firms with past earnings growth for past five years and three years. Panel B reports the numbers of firms who omit dividend (*Divomission*), firms who decrease dividends (*Divdecrease*), total number of firms, and firms with past earnings decline for past five years and three years. Appendix 3.1 contains detailed constructions of Payer, Newpayer, Divincrease, *Divomission* and *Divdecrease* Appendix 3.2 presents detailed constructions of *EPSG (1-5), EPSG (1-3), EPSG (1,5), EPSG (1,3), EPSD (1-5), EPSD (1-3), EPSD (1,5),* and *EPSD (1,3).*

Panel A							
Year	***Payer***	***Newpayer***	***Divincrease***	***EPSG(1-5)***	***EPSG(1-3)***	***EPSG(1,5)***	***EPSG(1,3)***
1963	531	0	345	2	2	97	108
1964	596	5	336	2	2	94	146
1965	657	10	393	1	2	150	203
1966	807	6	494	0	15	160	32
1967	936	7	519	0	218	204	411
1968	988	16	396	7	147	31	360
1969	1044	7	402	36	103	327	316
1970	1077	15	359	38	108	279	314
1971	1067	17	292	26	115	193	373
1972	1113	46	434	33	139	246	461
1973	1650	84	1087	42	200	452	671
1974	1896	112	1312	61	474	654	1046
1975	1951	131	1195	87	536	804	1027
1976	2051	177	1348	141	366	910	950
1977	2092	138	1523	138	431	1024	1424
1978	2069	92	1440	144	599	1054	1599
1979	2052	50	1411	176	793	1392	1646
1980	1977	46	1216	262	704	1544	1528
1981	1837	41	932	233	483	1378	1284
1982	1714	35	873	155	323	1122	1026
1983	1595	38	593	93	215	808	742
1984	1524	53	820	48	187	657	831
1985	1435	47	697	42	227	639	935
1986	1309	37	535	32	225	605	948
1987	1258	44	592	23	166	589	887
1988	1225	78	763	24	183	756	864
1989	1204	75	730	37	310	838	1147
1990	1194	65	670	45	361	818	1208
1991	1158	41	528	61	357	899	1254
1992	1171	54	487	62	279	900	1071
1993	1174	50	564	65	274	1008	1130
1994	1182	50	613	50	281	990	1188
1995	1195	56	666	66	442	1130	1481
1996	1159	41	584	73	434	1236	1542
1997	1113	38	514	94	429	1252	1602
1998	1063	31	485	78	405	1258	1498
1999	974	27	429	78	340	1153	1328
2000	886	26	376	64	326	1099	1309
Mean	***1314***	***50***	***709***	***69***	***295***	***757***	***944***
SD	***435***	***39***	***355***	***62***	***187***	***424***	***478***

Table 3.2 (continue)							
Panel B							
Year	***Divomission***	***Divdecrease***	***EPSD(1-5)***	***EPSD(1-3)***	***EPSD(1,5)***	***EPSD(1,3)***	***All firms***
1963	5	123	1	1	111	107	605
1964	3	104	0	0	126	78	678
1965	4	123	0	0	72	75	734
1966	5	186	0	3	64	16	923
1967	17	228	0	17	78	181	1221
1968	18	267	2	24	26	300	1320
1969	23	306	1	28	261	393	1461
1970	52	348	1	79	383	575	1596
1971	82	358	4	128	522	796	1707
1972	42	308	20	125	637	789	1806
1973	24	401	7	49	686	697	2605
1974	39	387	2	24	553	417	2953
1975	81	412	1	43	509	486	2997
1976	42	385	2	51	472	628	2954
1977	34	330	3	50	372	750	2882
1978	49	384	3	102	374	799	2792
1979	48	431	3	78	524	710	2897
1980	73	587	2	82	573	747	3055
1981	91	677	4	102	697	895	3098
1982	82	610	5	137	868	1085	3289
1983	105	702	14	292	1117	1431	3320
1984	50	493	20	240	1159	1351	3491
1985	62	491	27	167	1182	1190	3466
1986	71	511	23	180	1195	1192	3405
1987	69	472	26	152	1163	1195	3595
1988	63	266	12	168	1011	1312	3619
1989	55	287	4	103	870	989	3466
1990	59	280	11	88	1021	945	3421
1991	76	328	5	118	994	1112	3417
1992	66	380	10	219	1009	1413	3537
1993	69	349	11	198	1143	1396	3830
1994	72	301	17	186	1282	1343	4143
1995	39	264	11	112	1128	1062	4329
1996	56	300	8	110	1010	1071	4530
1997	46	327	10	116	934	1090	4754
1998	37	290	15	140	877	1234	4524
1999	36	236	13	153	959	1359	4198
2000	53	222	8	158	1057	1309	4028
Mean	**50**	**354**	**8**	**106**	**711**	**856**	***2912***
SD	**26**	**141**	**8**	**72**	**390**	**430**	***1166***

Panel B in Table 3.2 lists total numbers of *Divomission*, and *Divdecrease*. The number of firms that omit dividends and decrease dividends both peaked in 1983, and came to a historical low in 1999 and 2000, respectively. Meanwhile, for firms with previous EPS decline, their total number peaked around 1983, and dropped to a low around 1998, roughly corresponding to the peaks and troughs of *Divomission* and *Divdecrease*.

We create four type of dummy variables to capture firms' past growing/declining patterns in EPS. We use *EPSG(1-3)* and *EPSG(1-5)* to respectively represent firms' year-on-year (YoY) increase in EPS over the past three and five year; We use *EPSD(1-3)* and *EPSD(1-5)* to respectively represent firms' year-on-year (YoY) decline in EPS over the past three and five year; We use *EPSG(1,3)* and *EPSG(1,5)* to respectively represent firms' general increase in EPS over the past three and five year despite the possible fluctuation within the time period; We use *EPSD(1,3)* and *EPSD(1,5)* to respectively represent firms' general decline in EPS over the past three and five year.

There are four main reasons for use to choose dummy variables instead of continuous variables in this thesis. The first reason is that we can not create continuous variables to represent firms' past year-on-year increase/decrease in EPS; The second reason is that the amount of earnings itself can be affected by many other factors that go beyond the discussion in this thesis, but using dummy variables can at least partly skip the information of those factors in our analysis; Third, previous literature suggest the direct relation between amount of dividend and amount of earnings (e.g. Compbell and Shiller, 1988), but Baker and Wurgler (2004a) find that aggregated dividend amount is not affected by the behaviour factor which is dividend premium. It suggests an insignificant relation could be found between dividend level and the level of growing EPS, because the level of dividends and the level of earnings may both contents too many other information which are hardly to be analysed thoroughly. At last, as a robustness check which is not shown in this thesis, we test the relations between firms' dividend decisions and firms' changes in EPS, and found mixed results as we expected.

There is a positive relationship between firms' status of being payers and firms' status of experiencing past earnings growth in the U.S. market. Figure 3.1 contains four sub-figures which respectively show a strong positive relationship between (1) the proportion of dividend payers among all firms and the proportion of firms who experience year-on-year (YoY) increasing earnings over the past three years (*EPSG(1-3)*); (2) the proportion of dividend payers among all firms and the proportion of firms who experience YoY increasing earnings over the past five years (*EPSG(1-5)*); (3) the proportion of dividend payers among all firms and the proportion of firms who experience generally increasing earnings over the past three years (*EPSG(1,3)*); (4) the proportion of dividend payers among all firms and the proportion of firms who experience generally increasing earnings over the past five years (*EPSG(1,5)*). Although there is a lagged response of *EPSG(1-n)* on proportion of payers, proportion of firms with *EPSG(1-n)* and proportion of payers peak and reach sub-bottoms in many years such as 1971, 1987, 1991, and 1997. From Figure 1, we find that the proportion of *Payer* peaks around the late 1970s followed by sharp decreases. The graph for *EPSG(1-3)* shows similar trends, although *EPSG(1-3)* is more volatile than *Payer*. This less varied response from *Payers* to previous profitability growth can be explained by the theory that dividends are "sticky"

(Guttman et al., 2010). In addition, this difference in volatilities may suggest that dividend-paying decisions are affected by multiple factors, not by firms' past earnings growth only, but dividend decisions cannot escape from the influence of past earnings growth.

Partial plots are created between the detrended proportion of payers and the detrended proportion of EPSG among all firms. All variables that proxy for firms' past growing EPS patterns explain at least 48% of firms' decisions to be dividend payers. Besides, if the outlier at 1966 is deleted, the variation of *EPSG(1-3)* can explain 78% variation of dividend payers' proportion, and the variation of *EPSG(1,3)* can explain 77% of dividend payers' proportion.

Figure 3.3 contains four sub-figures which respectively show a strong positive relationship between the proportion of *Newpayer* among all firms and (1) the proportion of firms with *EPSG(1-3)*; (2) the proportion of firms with *EPSG(1-5)*; (3) the proportion of firms with *EPSG(1,3)*; (4) the proportion of firms with *EPSG(1,5)*. Compared with the proportion of dividend payers in Figure 3.2, Figure 3.3 shows that the proportion of new dividend payers sharply drops slightly earlier at 1976, and then keeps fluctuating after 1984 rather than continuing to decrease.

Figure 3.1 The relationship between the proportion of dividend payers and the proportion of firms with growing EPS over past three years or five years.

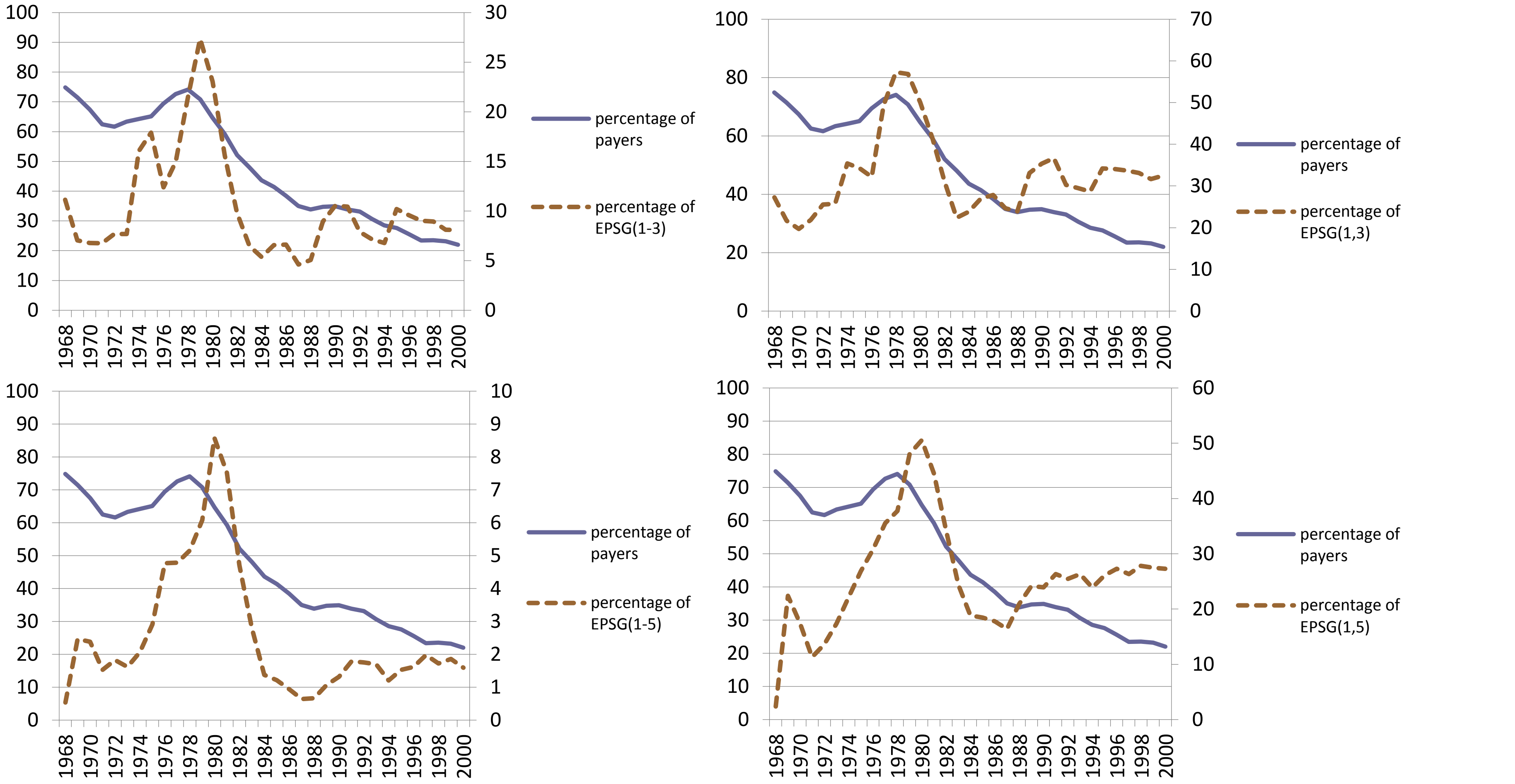


Figure 3.2 Partial relationship between the proportion of payers and the proportion of firms with increases in EPS over the past three to five years

First two regressions are run by using COMPUSTAT data from 1966 to 2000 for payer against *EPSG(1-3)* and *EPSG(1,3)*, with the first three years being used to construct *EPSG(1-3)* and *EPSG(1,3).* An outlier on the left hand side is an observation for the fiscal year 1966 of first two figures (top left and top right). When we run regressions based on sample period from 1967 to 2000 without the outlier, the R^2 increases to 0.78 for *EPSG(1-3)*, and 0.77 for *EPSG(1,3).* Last two regressions are run from 1968 to 2000 for payers against *EPSG(1-5)* and *EPSG(1,5),* with the first five years being used to construct *EPSG(1-5)* and *EPSG(1,5).*

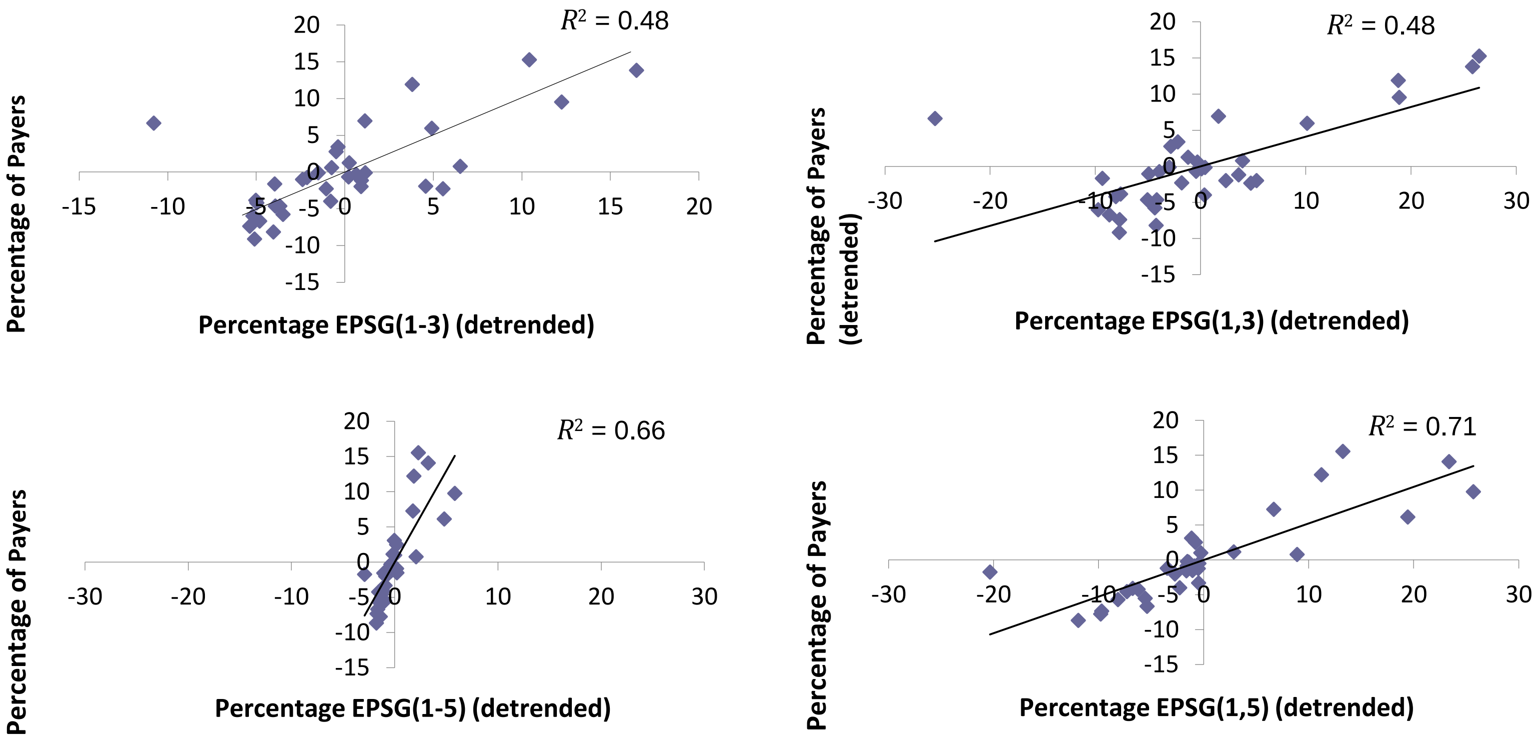
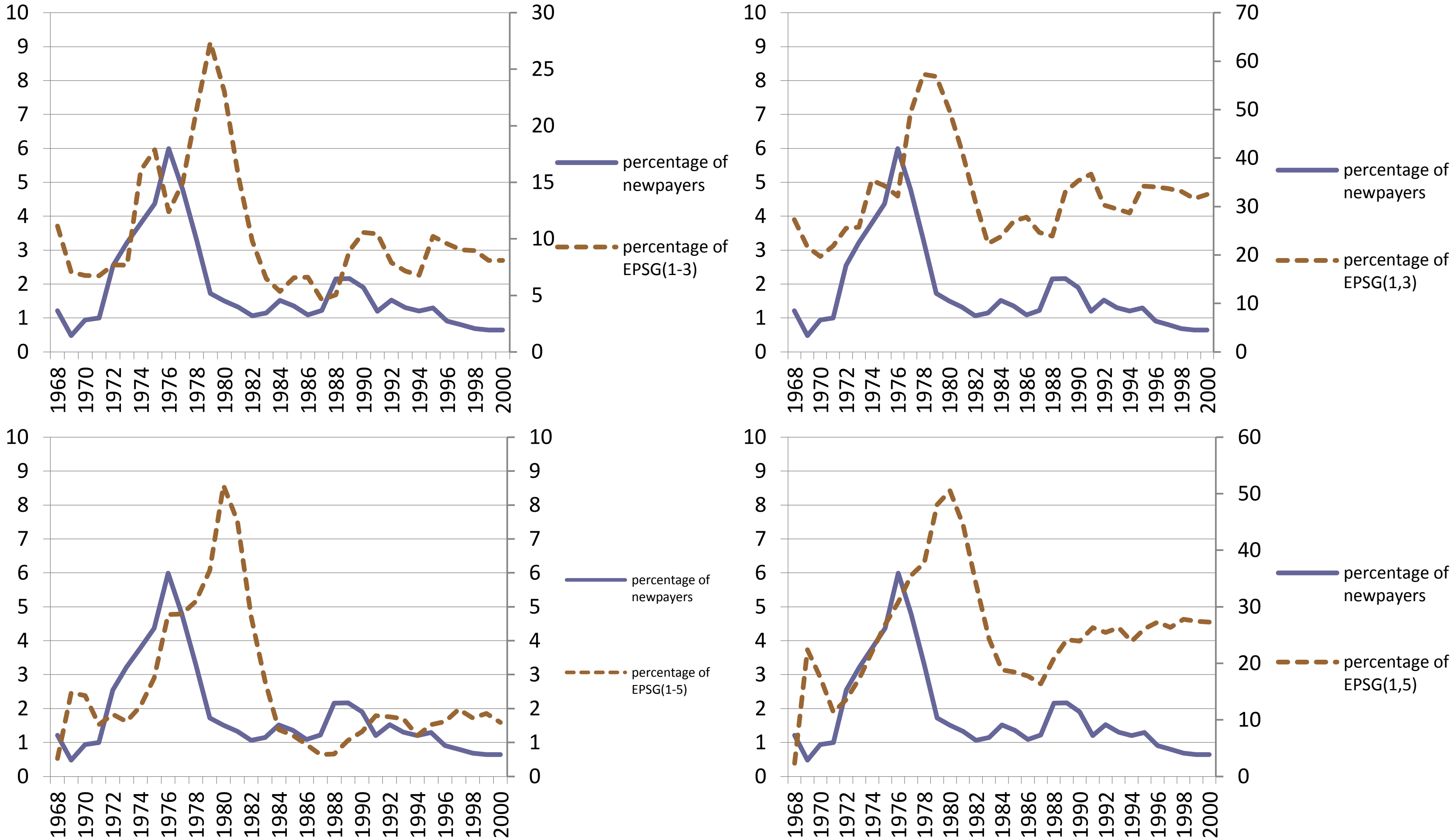


Figure 3.3 The relationship between the proportion of new dividend payers and the proportion of firms with growing EPS over past three years or five years.



As a summary, Figure 3.2 and Figure 3.3 provide empirical evidence that firms' dividend-paying decisions are positively related with firms' past experience of growing EPS. Although the changes in the proportion of firms with *EPSG(1-n)* or *EPSG(1,n)* can match or be one year ahead of the change in payers' proportion in most circumstances, there are still several exceptions that changes in proportion of *EPSG(1-n)* or *EPSG(1,n)* are lagged after changes in the proportion of payers. For example, in an early stage, payers' proportion begins to increase smoothly in 1972, and the proportion of *EPSG(1-3)* firms begins to sharply increase at 1973. Later, the proportion of payers reaches its peak at 1978, when the proportion of firms with *EPSG(1-3)* reaches its peak at 1979. This lag for proportion of *EPSG(1-3)* compared with proportion of payers may indicate that a shorter-term increase in EPS also affects firms' dividend decisions. In Figure 3.4, we compare the proportion of payers with the proportion of firms with one-year increase in EPS (defined as *EPSG(1)*) which represents firms' one-year increases in EPS. We find the evidence that the proportion of firms with one-year growth in EPS increases begin to increase at 1971, and drop from 1977 which are both one-year earlier than the movement of payers. However, there is not a general decreasing trend after 1978 which can be observed for firms with *EPSG(1)*, so the effect of a short-term increase in EPS on dividend decisions may be limited. Considering the fact that current profitability appears in Fama and French (2001), Baker and Wurgler (2004a), and Hoberg and Probhala (2009)'s logistic regression, the short-term impact of EPS on dividend decisions can be considered to be controlled[5].

[5] We also run extra tests for testing whether 2-year or 1-year increase/decline in EPS can affect firms' dividend decisions. We find the evidence that the firms' dividend decisions are also affected by increase/decline in EPS over past two years or one year.

Figure 3.4 Proportion of payers and proportion of firms with current increase in EPS (to the total number of all firms)

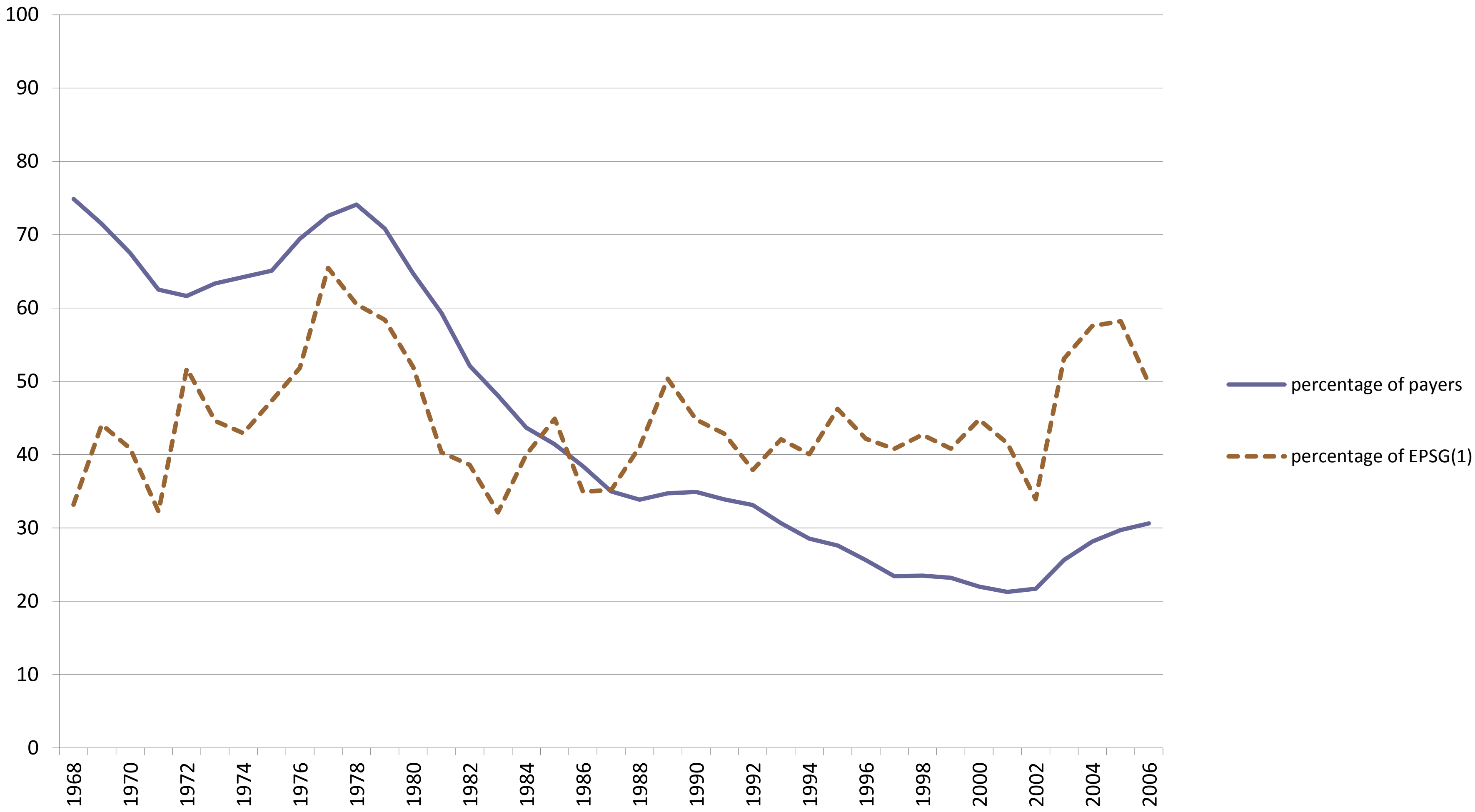


Figure 3.5 is a general summary of trends as well as comparisons for dividend payers among all firms and dividend payers among firms with past persistent growth in EPS. The proportion of payers is the number of payers to the total number of firms at fiscal year t, when the proportion of dividend payers among *EPSG(1-n)* is the conditional proportion of dividend payers among firms who have experienced YoY/stable increases in EPS over the previous three/five years.

Figure 3.5 shows that there is a predominantly higher proportion of payers among *EPSG(1-n)* firms than the proportion of payers among all firms within our sample period. As has been confirmed by Baker and Wurgler (2004a), the proportion of payers was kept at a high level before the 1980s, but drops in the late 1970s, and stability decreases for years, until recent years after 2004 which is out of Baker and Wurgler (2004a), and Hoberg and Prabhala (2009) sample periods. The similar trend can also be observed for sub-samples of firms with past stable EPS's increases for three years. Overall, Figure 3.5 suggests that past earnings growth is one factor that drives managers to pay dividends, and this influence is robust after controlling for the time effect and impacts of other possible dividend decisions' determinants.

Figure 3.6 reports co-movement of proportion for dividend continuation firms and proportion for firms with past growth in EPS, while Figure 3.7 reports movements of proportion for firms who increase dividends and proportion for firms with past growth in EPS. We find similar evidence that there are positive relations between firms' past growth in EPS and firms' decisions to continuing/increasing dividends.

Figure 3.5 The relationship between the proportions of dividend payers amount all firms and the proportion of dividend payers among firms with growing EPS over past three years or five years.

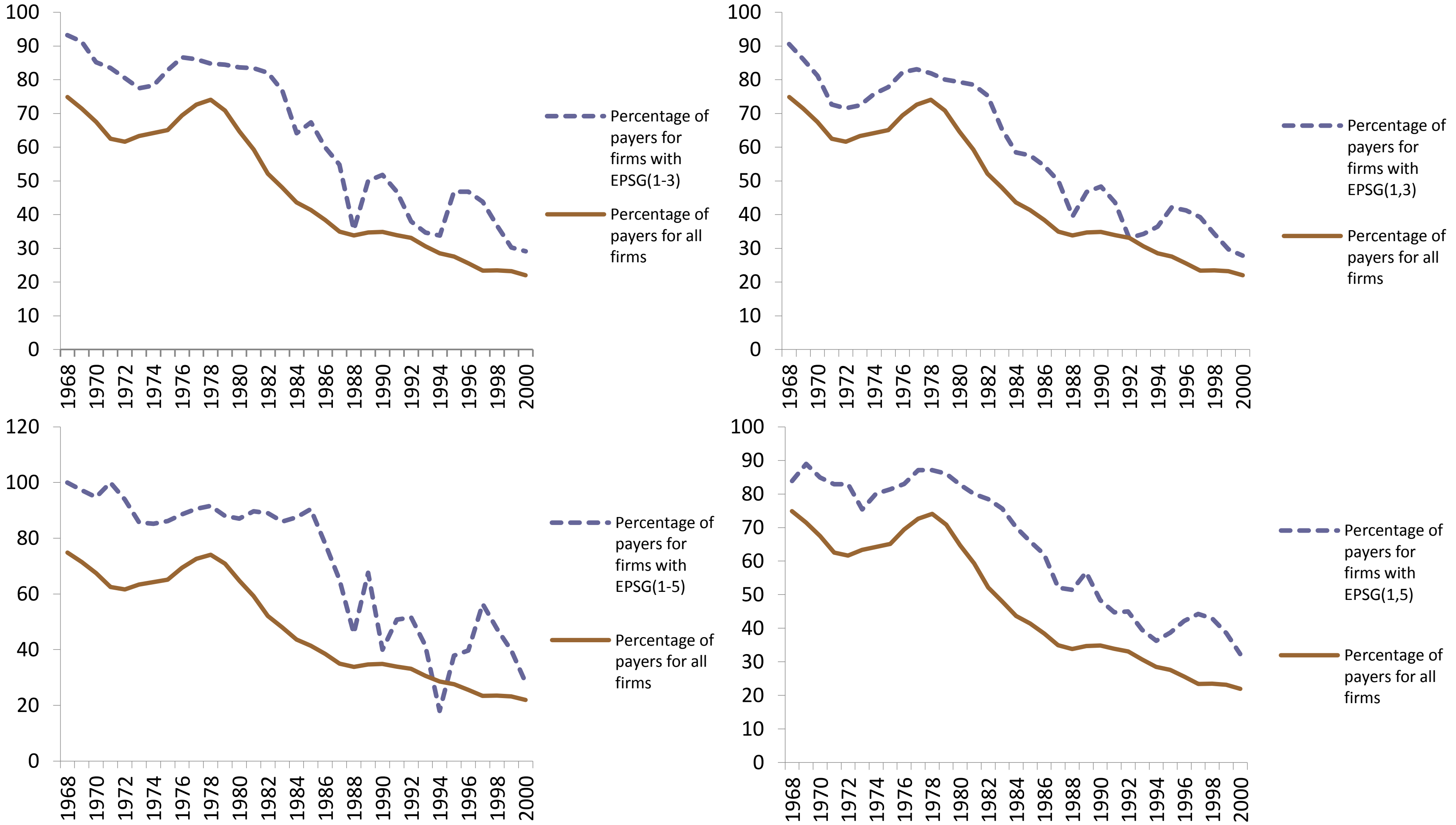


Figure 3.6 The relationship between the proportion of firms who continue dividends and the proportion of firms with growing EPS over past three years or five years.

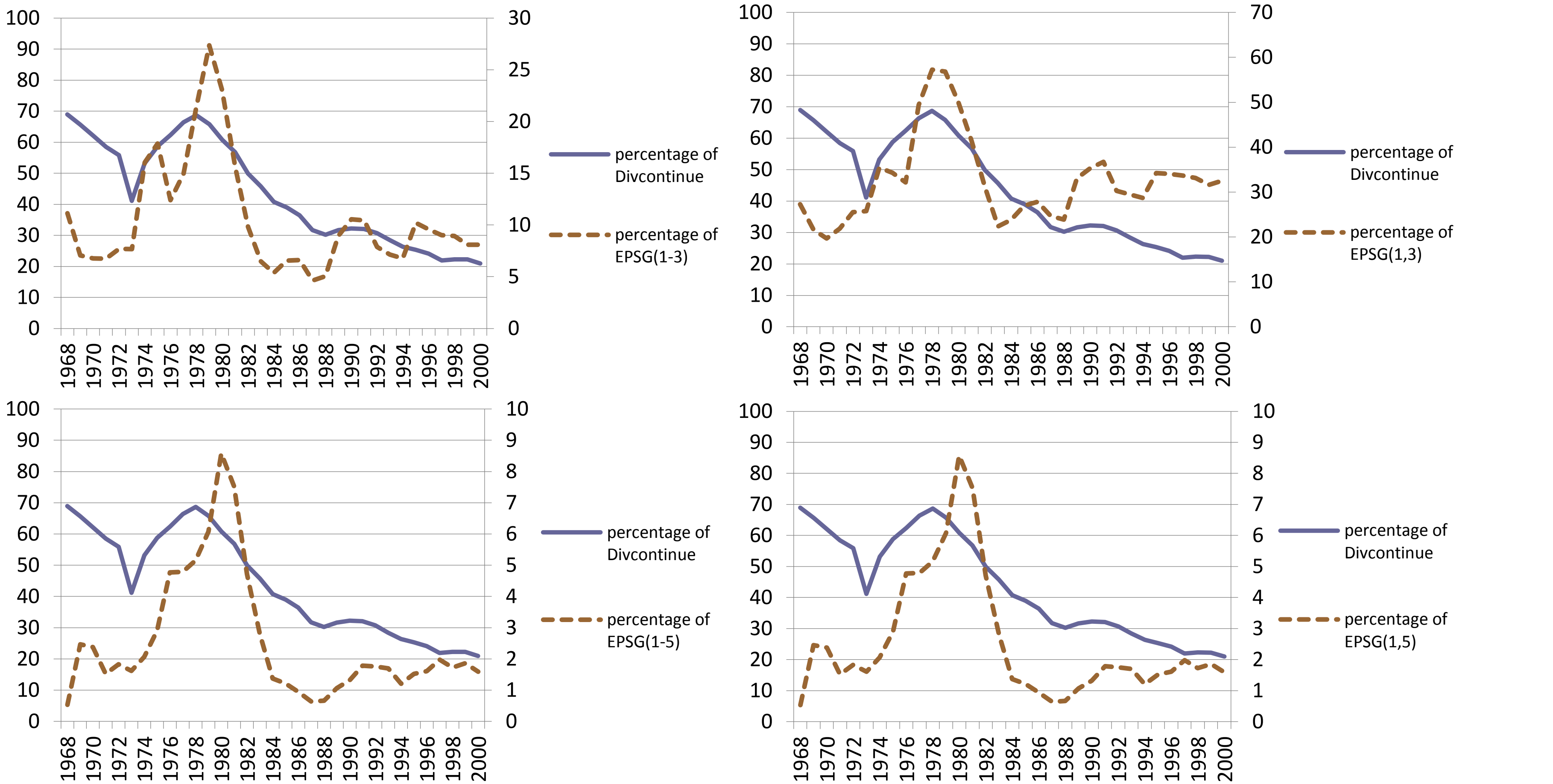
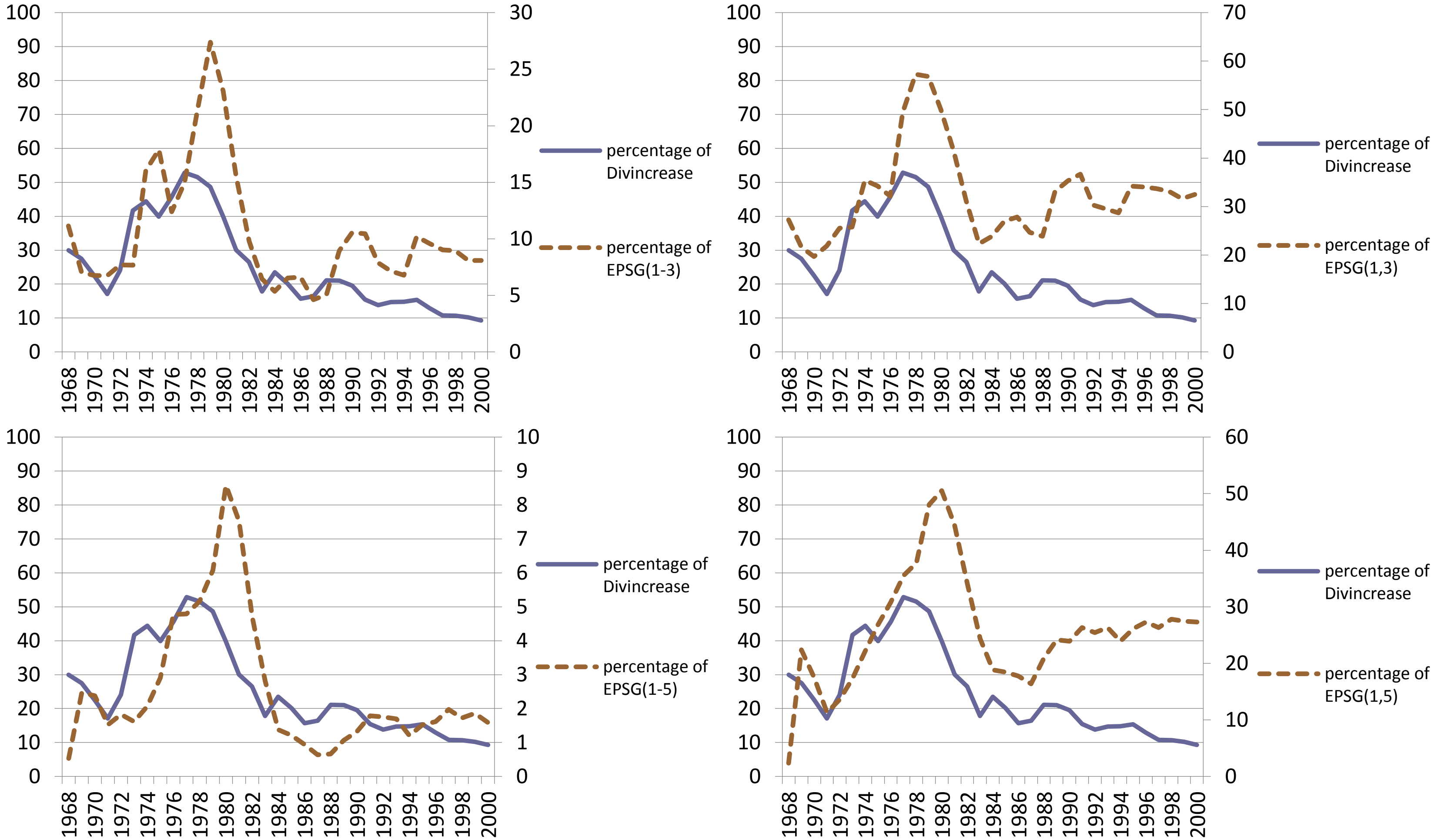


Figure 3.7 The relationship between the proportion of firms who increase dividends and the proportion of firms with growing EPS over past three years or five years.



The movement of proportion for dividend-omission firms and proportion for firms with past declining EPS are compared in Figure 8, while the movement of proportion for dividend-decrease firms and proportion for firms with past declining EPS are compared in Figure 9. Figure 8 and Figure 9 show that the proportion of firms who omit/decrease dividends have several matched sub-peaks and sub-bottoms with the proportion of firms who experience past decreasing EPS.

As an additional evidence, we use the same method in Figure 3.5 to compare proportions of firms who initiate/continue/increase dividends among firms who experience previously growing EPS in Figure 3.10, Figure 3.11, and Figure 3.12 respectively, and proportions of firms who omit/decrease dividends among all firms in Figure 3.13 and Figure 3.14 respectively, and compare proportions of firms who decrease dividends among firms who experience previously declining EPS and proportions of firms who decrease dividends among all firms in Figure 3.11[6].

Although the proportion of firms initiate dividends among firms with past growth is not consistently higher than the proportion of new dividend payers among all firms, we find evidence that the proportion of firms that initiate dividends is mostly higher than the proportion of dividend initiators among all firms during a pre-crisis period from 1982 to 2007 in Figure 3.10. In addition, proportion of initiators among all firms and proportion of initiators among firms with past increasing EPS have similar degree of volatility.

[6] Because there are limited observations for dividend-initiating payers or dividend-omitting non-payers given EPSG or EPSD conditions, especially for firms with *EPSG (1-5) or EPSD(1-5)* (dividend initiation only has mostly less than 4 observations with *EPSG (1-5)* in years 1973-1981, 1983, 1986-1995, and 1999, and 0 observation in other years) dividend omission only has less than 4 observations with *EPSD (1-5)* in years 1971, 1972, 1981-1988, 1990, 1994, and 1998, and 0 observation in other years), we delete year data with zero observations in these figures and only keep those that have avaliable observations.

Figure 3.8 The relationship between the proportion of firms who omit dividends and the proportion of firms with decreasing EPS over past three years or five years.

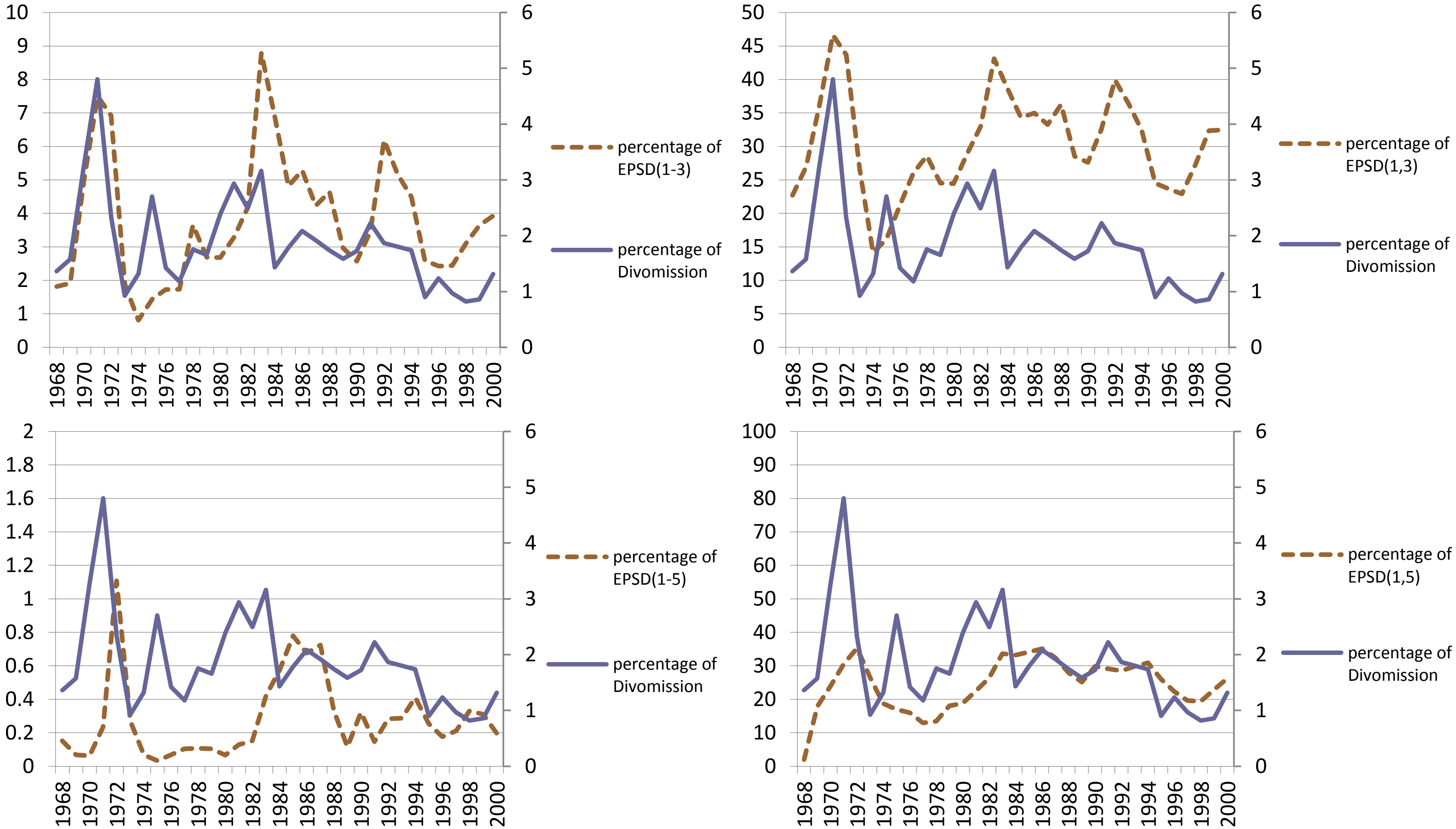


Figure 3.9 The relationship between the proportion of firms who decrease dividends and the proportion of firms with decreasing EPS over past three years or five years.

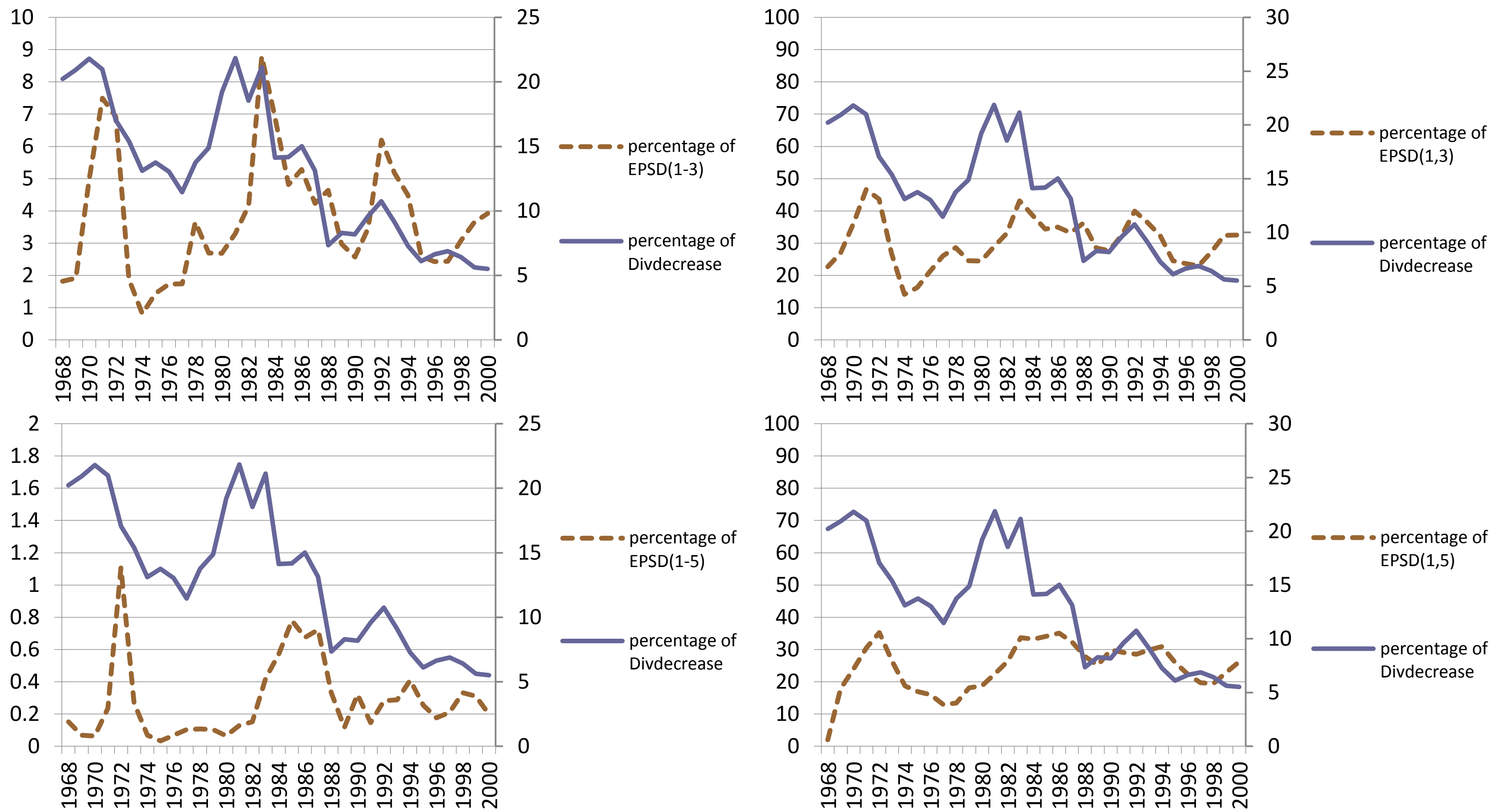


Figure 3.10 The proportion of firms that initiate dividends among all firms and the proportion of firms who initiate dividends among firms with earnings growths over the past three years or past five years

Figure 3.10 contains four sub-figures that respectively show time-series movements in the intersections of firms that initiate dividend and also experience past earnings growths over the past three years (*EPSG(1-3)*, *EPSG(1,3)*) and past five years (*EPSG(1-5)*, *EPSG(1,5)*), together with proportion of firms that initiate dividends among all firms.

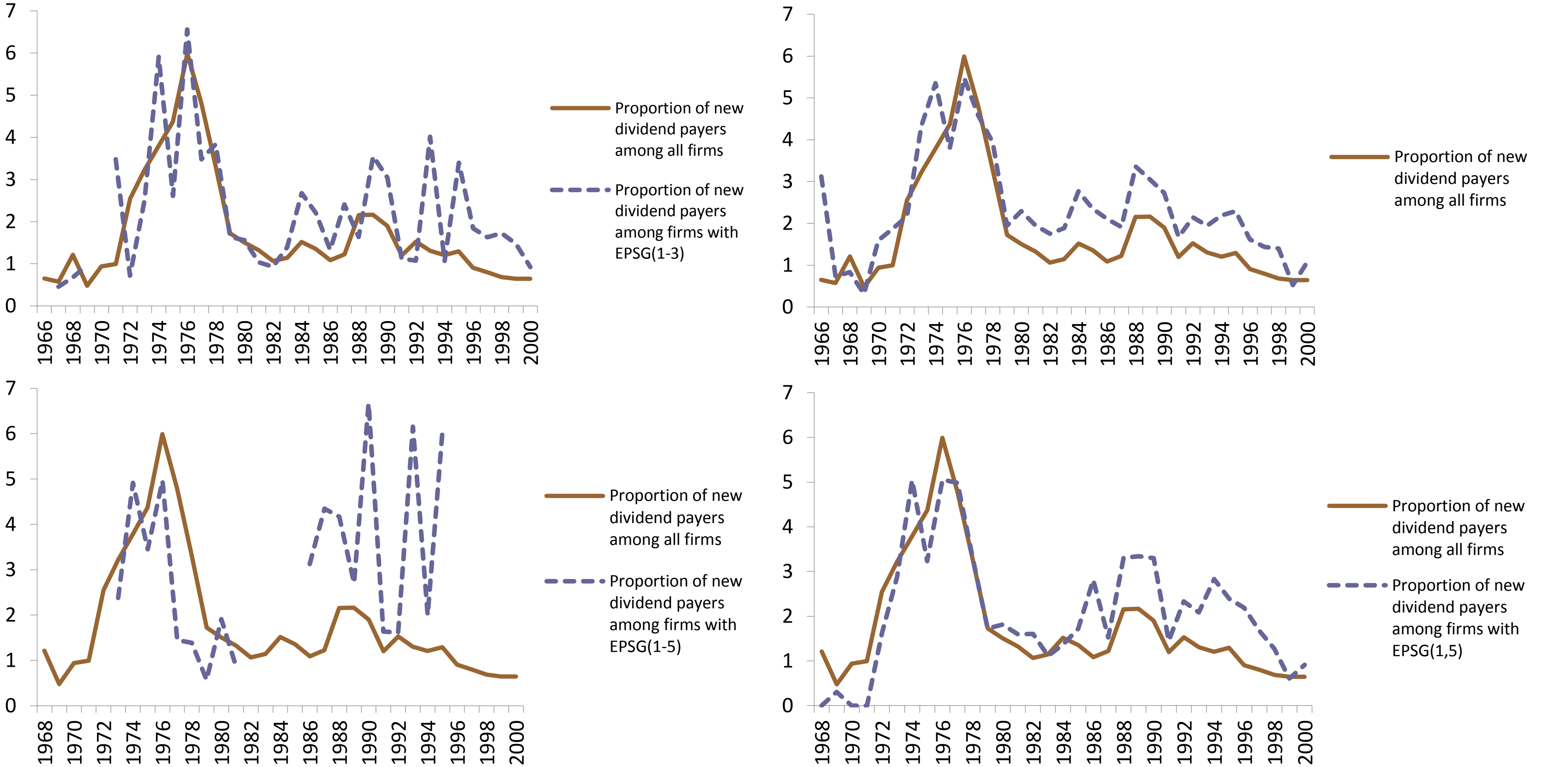
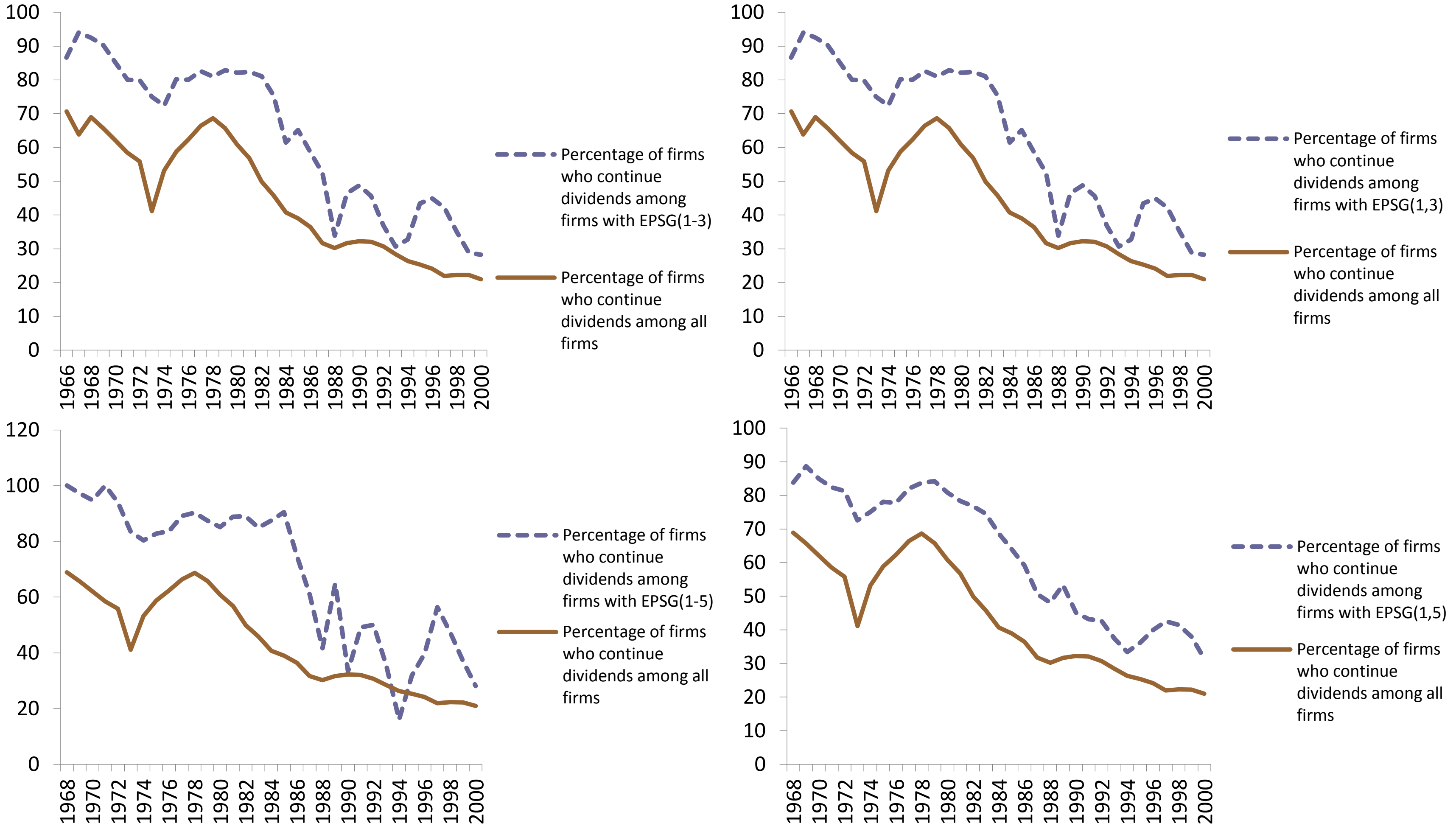


Figure 3.11 The relationship between the percentage of firms who continue dividends among all firms and the percentage of firms who increase dividends among firms with earnings growths over the past three years or past five years



We find similar moving trend between proportion of firms that continue dividends among all firms and the proportion of firms that continue dividends among firms with past growth in EPS. Except the observation in 1994 for the figure of *EPSG(1-5)*, the proportion of dividend-continuing payers among firms with EPSG is predominantly higher than the proportion of firms that continue dividends among all firms.

Although the proportion of firms increasing dividend payments among all firms or among all firms with previously increasing EPS patterns show more fluctuation than dividend payers and dividend-increasing payers in Figure 3.12, there is still only one exception, from 1994, when the proportion of firms who increase dividends among firms with *EPSG(1-5)* is lower than the proportion of firms who increase dividends among all firms.

Figure 3.13 exhibits that the proportion of firms that omit dividends among firms with previous declines in EPS is predominantly higher than the proportion of firms that omit dividends among all firms with only two exceptions in 1969 and 2006 for the sub-figure with *EPSG(1,5)*. In Figure 3.14, we delete some years' data with zero observations for the sub-figure with condition of *EPSG(1-5)*, and find that firms with year-on-year decreasing EPS over the past three years or five years are much more likely to become dividend-decreasing payers. Although in the early stage, the proportion of firms who decrease dividends among firms with *EPSG(1-3)/EPSG(1,3)* is not predominantly higher than the proportion of dividend-decreasing payers among all firms until 1984. They have similar trends and movement with the proportion of dividend-decreasing payers among all firms, and exceed for many years before 1984.

Figure 3.12 The percentage of firms that increase dividends among all firms and the percentage of firms who increase dividends among firms with earnings growths over the past three years or past five years

Figure 3.12 contains four sub-figures that respectively show time-series movements in the intersections of firms that increase dividend and also experience past earnings growths over the past three years (*EPSG(1-3)*, *EPSG(1,3)*) and past five years (*EPSG(1-5)*, *EPSG(1,5)*), together with proportion of firms that increase dividends among all firms.

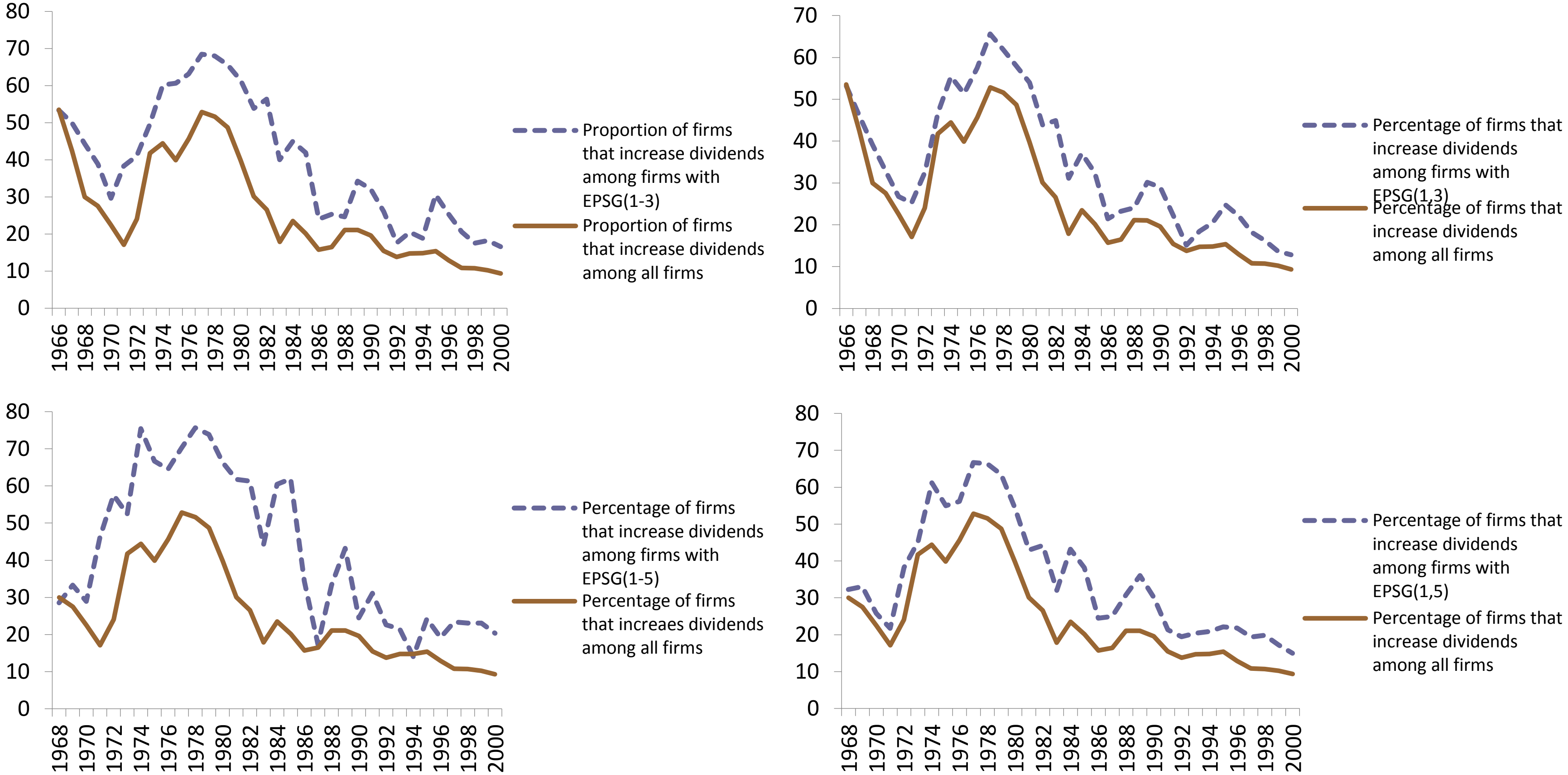


Figure 3.13 The percentage of firms that omit dividends among all firms and the percentage of firms that omit dividends among firms with earnings declines over the past three years or past five years

Figure 3.13 contains four sub-figures that respectively show time-series movements in the intersections of firms that omit dividend and also experience past earnings declines over the past three years (*EPSD(1-3)*, *EPSD(1,3)*) and past five years (*EPSD(1-5)*, *EPSD(1,5)*), together with proportion of firms that omit dividends among all firms.

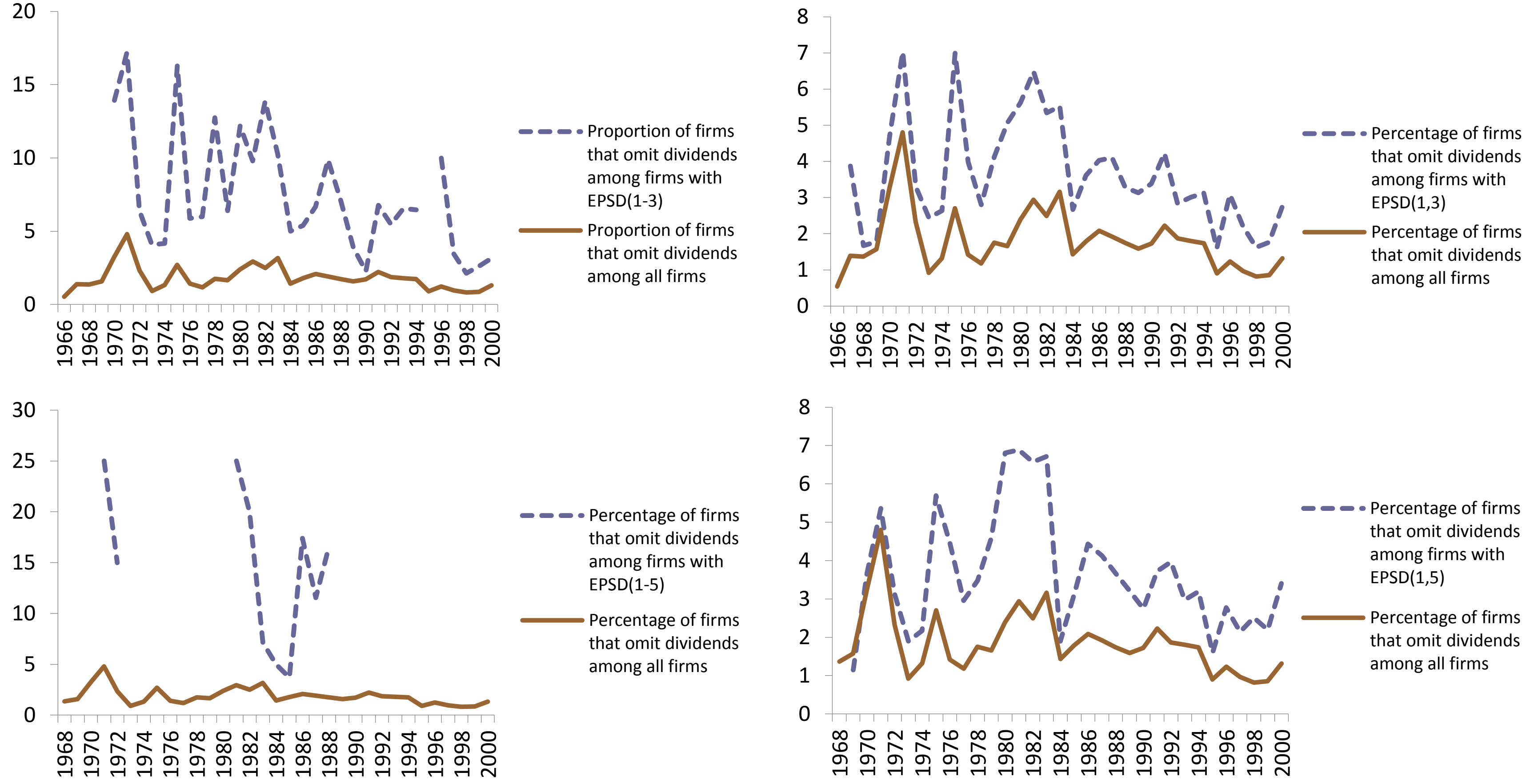
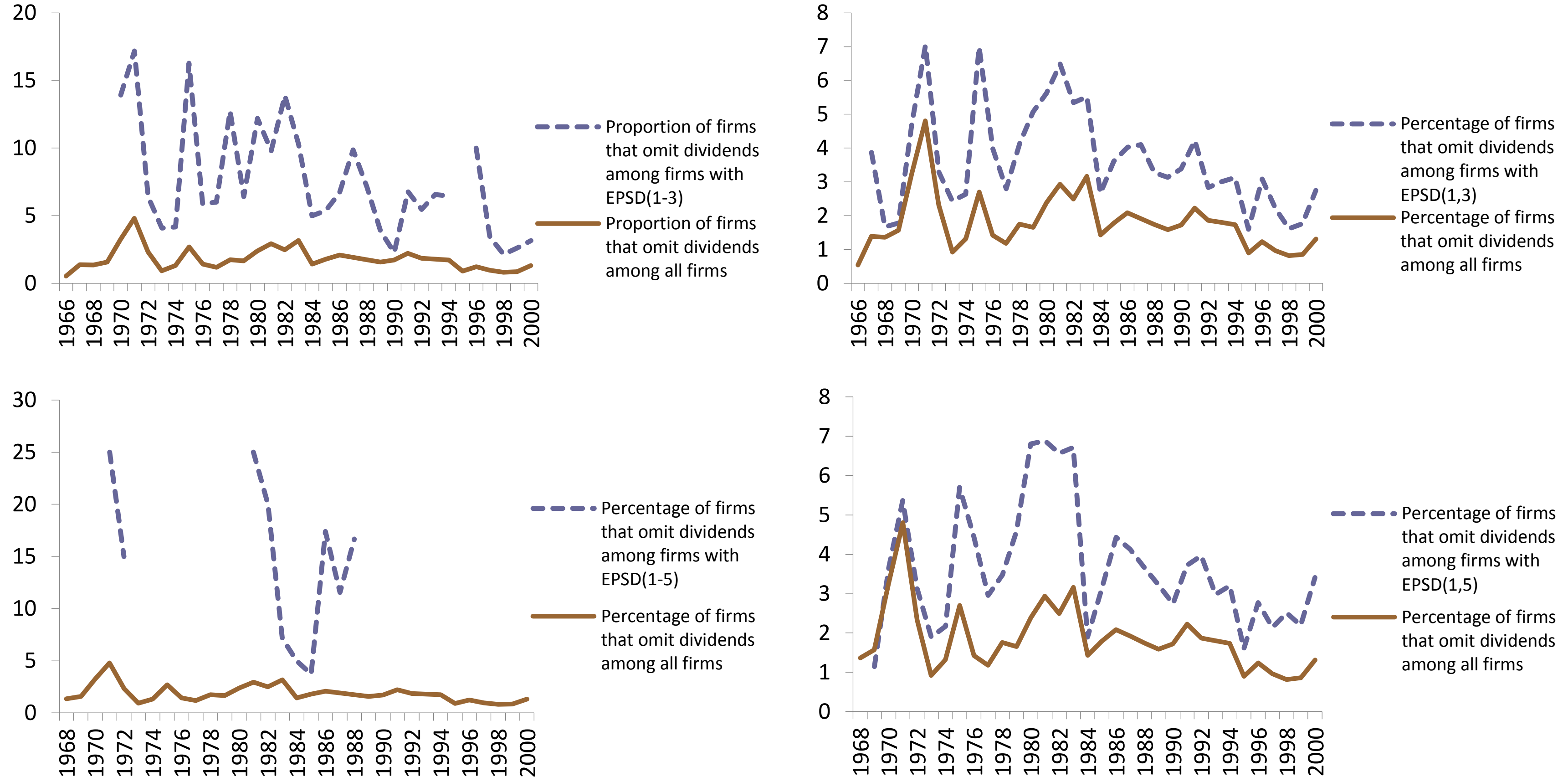


Figure 3.14 The percentage of firms that decrease dividends among all firms and the percentage of firms that decrease dividends among firms with earnings declines over the past three years or past five years

Figure 3.14 contains four sub-figures that respectively show time-series movements in the intersections of firms that decrease dividend and also experience past earnings declines over the past three years (*EPSD(1-3)*, *EPSD(1,3)*) and past five years (*EPSD(1-5)*, *EPSD(1,5)*), together with proportion of firms that decrease dividends among all firms.



In summary, the conditional proportion of firms that make varying dividend decisions among firms that experience past growths/declines in EPS is usually higher than the unconditional proportion of firms that make these dividend decisions among all firms. This finding can indicate that past EPS's growths/declines are likely to be one of determinants on firms' dividend decisions.

3.4. Methodology

3.4.1. Firms' paying status

The dividend-paying status of a firm in each year is either: i) being a dividend payer (DATA26 > 0), ii) becoming a new dividend payer (DATA26 > 0 at fiscal year *t*, and DATA26 = 0 at fiscal year *t*-1), or iii) being a dividend-increasing payer ($DATA26_t > DATA26_{t-1} > 0$). For providing comparisons with other dividend-paying firms, we will also analyse firms in each year who are i) being a dividend-decreasing payer ($0 < DATA26_t < DATA26_{t-1}$), and ii) dividend omissions (DATA26 = 0 at fiscal year *t*, and DATA26 > 0 at fiscal year *t*-1) [7].

We mainly use four groups of dummies (*Payer, Newpayer, divcontinue, and divincrease*) to represent firms' pay-out status at fiscal year *t* by following Hoberg and Probhala (2009) and Baker and Wurgler (2004a). As a summary, (1) *Payer* is the group of firms who pay dividends at current fiscal year *t*; (2) *Newpayer* is the group of firms who pay dividends at current fiscal year t, and did not pay dividends at last fiscal year *t*-1; (3) *divcontinue* is the group of firms who pay dividends at current

[7] New dividend payers who are non-payers in last fiscal year is a sub-group of current dividend payers who can be payers, non-payers, or did not exist at last fiscal year.

fiscal year t, and also pay dividends at past fiscal year *t*-1; (4) divincrease is the group of firms who increase dividends at current fiscal year *t* under the condition that they also pay dividends at last fiscal year *t*-1 (See Appendix 3.3 for details).

3.4.2. Propensity to pay dividends, propensity to initiate dividends, propensity to continue dividends, and propensity to increase dividends.

We run logistic regressions respectively for four groups in equation (1) to equation (4) to get firms' propensity to initiate dividends, propensity to continue dividends, propensity to increase dividends, and propensity to pay dividends:

$$\Pr\left(Payer_{it}=1\,|\,Payer_{i,t-1}=0\right)=\text{logit}(a_0+a_1NYP_{it}+a_2\frac{M}{B_{it}}+a_3\frac{\Delta A}{A_{it}}+a_4\frac{E}{A_{it}})+u_{it} \quad (1)$$

$$\Pr\left(Divcontinue_{it}=1\right)=\text{logit}(b_0+b_1NYP_{it}+b_2\frac{M}{B_{it}}+b_3\frac{dA}{A_{it}}+b_4\frac{E}{A_{it}})+\lambda_{it} \quad (2)$$

$$\Pr\left(Divincrease_{it}=1\right)=\text{logit}(c_0+c_1NYP_{it}+c_2\frac{M}{B_{it}}+c_3\frac{\Delta A}{A_{it}}+c_4\frac{E}{A_{it}})+\gamma_{it} \quad (3)$$

$$\Pr\left(Payer_{it}=1\right)=\text{logit}(d_0+d_1NYP_{it}+d_2\frac{M}{B_{it}}+d_3\frac{dA}{A_{it}}+d_4\frac{E}{A_{it}})+\nu_{it} \quad (4)$$

where *NYP* is the firm's NYSE market capitalization percentile (Fama and French 2001; Baker and Wurgler 2004a), *E/A* represents firm's profitability (Fama and French 2001; Baker and Wurgler 2004a), market-to-book ratio (*M/B*) (Baker and Wurgler, 2004a) and asset growth ($\Delta A/A$) (Fama and French 2001; Baker and Wurgler 2004a) are proxies for firms' investment opportunities. We also control for dividend premium which is the catering factor developed by Baker and Wurgler (2004a). Detailed descriptions for all the variables are in Appendix 3.3.

Specifically, we regress binary variables of being new dividend payers, being dividend payers, continuing being dividend payers, or increasing dividends on fundamental dividend policy determinants including size, profitability, investment opportunities, and risks for each year with Newey-West adjustment to two lags as in Fama and French (2001), and Baker and Wurgler (2004a).[8] In detail, (i) we construct the propensity to initiate (*PTI*) dividend, as in Baker and Wurgler (2004a), which is the residual u_{it} from running logistic regression in equation (1); (ii) we construct the propensity to pay (*PTP*) dividends, as in Hoberg and Prabhala (2009), which is the residual u_{it} from running logistic regression in equation (2); (iii) we construct the propensity to continue (*PTC*) dividends, as in Baker and Wurgler (2004a), which is the residual u_{it} from running logistic regression in equation (3); (iv) we construct the propensity to increase (*PTIN*) dividends which is the residual u_{it} from running logistic regression in equation (4).

We use the same method to test determinants of decisions on omitting/decreasing dividends, and then save residuals from equation (5) and equation (6) as propensity to omit (*PTO*) and propensity to decrease (*PTD*) respectively.

$$\Pr\left(Payer_{it}=0 \mid Payer_{i,t-1}=1\right)=\text{logit}(i_0+i_1 NYP_{it}+i_2\frac{M}{B_{it}}+i_3\frac{\Delta A}{A_{it}}+i_4\frac{E}{A_{it}})+\xi_{it} \tag{5}$$

$$\Pr\left(Divdecrease_{it}=1\right)=\text{logit}(k_0+k_1 NYP_{it}+k_2\frac{M}{B_{it}}+k_3\frac{\Delta A}{A_{it}}+k_4\frac{E}{A_{it}})+\zeta_{it} \tag{6}$$

[8] Bulan et al. (2007) use the moral hazard model, and they find that dividend premium can still explain firms' dividend decision after controlling risk factors. Jiang et al. (2013) also use the multinomial logistic regression model to test both risk factors and dividend premium's impact on dividend decisions. These studies have opposite conclusions on whether dividend premium has any impact on dividend decisions which is the conclusion of Hoberg and Prabhala (2009) who use the Fama-Macbeth logistic regression.

3.4.3. Firms' historical EPS growth

The main variables of interest that may affect a firm's dividend decision are the patterns of a firm's past profitability growth. We use past earnings per share excluding extraordinary items (DATA58) to represent firms' profitability. We use dummy variables, which is the status of EPS's historical long-term increase, to represent firms' historical long-term earnings performance.

The variables that contain information about the trajectory of EPS increases are: i) *EPSG(1-3)* and *EPSG(1-5)* that represent YoY EPS increases over the past three and five years, respectively; and ii) *EPSG(1,3)* and *EPSG(1,5)* that represent general EPS increases over the past three and five years, respectively.

We classify firms' past long-term earnings patterns into YoY increases and general increases. For each increasing pattern, we use two time lengths which are three-year and five-year. We use the time length of three-year because investors and managers can usually find firms' past three years' accounting items in the current annual report. Publicly available information can remind managers more frequently than information with limited availability, so three-year financial information may affect managers more than other time lengths of financial information when managers are making financial decisions by considering past information.

We classify firms' past earnings' pattern into four categories: five-year YoY growths (*EPSG(1-5)*), three-year YoY growths (*EPSG(1-3)*), five-year general EPS increase ignoring fluctuation within the past five years (*EPSG(1,5)*), and 3-year general EPS increase ignoring fluctuation within the past three years (*EPSG(1,3)*). Detailed definition of these variables can be found in Appendix 3.2.

3.4.4. Overreaction or dividend premium?

Having constructed the propensity to initiate/pay/continue/increase dividends, we test the effect of past EPS growth patterns on dividend policy.

After the first step with the Fama-Macbeth logistic regression, we jointly test the impact of firms' past earnings growth and Baker and Wurgler (2004a)'s catering theory, which is the yearly value-weighted dividend premium and is calculated as the difference between the log of weighted *M/B* ratio for payers and the log of *M/B* ratio for non-payers, on firms' *PTI, PTC, PTIN,* and ΔPTP. We control for the yearly value-weighted dividend premium ($VW\ P^{D-ND}$) of the catering theory developed by Baker and Wurgler (2004a). The dividend premium is the difference between the log of weighted *M/B* ratio for payers and the log of *M/B* ratio for non-payers.

$$\widetilde{PTI_{i,t}} = e_0 + e_1 VW\ \mathrm{P}_{t-1}^{D-ND} + e_2 HistEPS_{i,t} + e_3 IND_{i,t} + \varepsilon_{it} \tag{7}$$

$$\widetilde{PTC_{i,t}} = f_0 + f_1 VW\ \mathrm{P}_{t-1}^{D-ND} + f_2 HistEPS_{i,t} + f_3 IND_{i,t} + \theta_{it} \tag{8}$$

$$\widetilde{PTIN_{i,t}} = g_0 + g_1 VW\ \mathrm{P}_{t-1}^{D-ND} + g_2 HistEPS_{i,t} + g_3 IND_{i,t} + \varpi_{it} \tag{9}$$

$$\Delta\widetilde{PTP_{i,t}} = b_0 + b_1 VW\ \mathrm{P}_{t-1}^{D-ND} + b_2 HistEPS_{i,t} + b_3 IND_{i,t} + v_{it} \tag{10}$$

where $VW\ P^{D-ND}$ is the book-value weighted dividend premium, which is the difference between the log of weighted *M/B* ratio for payers and the log of *M/B* ratio for non-payers. The dividend premium is a yearly variable, and hence also captures the yearly effect. *HistEPS* is the variable that contains information regarding the trajectory of EPS increases. *EPSG(1-3)* and *EPSG(1-5)* represent, respectively, year-on-year EPS increases over the previous three and five years. *EPSG(1,3)* and *EPSG(1,5)* represent, respectively, general EPS increases over the previous three and five years. These EPS-related variables are created as alternatives to represent firms' previous profitability growth. *IND* is the vector of industry dummies [9] .

It should be noted that dependent variables in equation (7) to equation (9), and equation (10) are different. ΔPTP is the change in propensity to pay, which is used by Hoberg and Prabhala (2009), while *PTI* and *PTC* defined by Baker and Wurgler (2004a) are the propensity to pay/continue dividends for firms who are non-payers/payers at the last fiscal year.

In contrast, we also test managerial extrapolation of previously declining EPS on firms' propensity to omit/decrease dividends. The regression function which investigates behaviour determinants of *PTO* is shown in equation (11), while the function which investigates behaviour determinants of *PTD* is shown in equation (12)[10].

$$\widetilde{PTO_{\iota,t}} = j_0 + j_1 VW\ \mathrm{P}_{t-1}^{D-ND} + j_2 HistEPS_{i,t} + j_3 IND_{i,t} + \psi_{it} \tag{11}$$

$$\widetilde{PTD_{\iota,t}} = l_0 + l_1 VW\ \mathrm{P}_{t-1}^{D-ND} + l_2 HistEPS_{i,t} + l_3 IND_{i,t} + \tau_{it} \tag{12}$$

3.5. Results

3.5.1. Firms who choose to initiate/continue/increase/pay dividends

By following the method used by Baker and Wurgler (2004a), and Hoberg and Probhala (2009), we run regressions based on the sample from 1963 to 2000. Table 3.3 to Table 3.6 give details about the Fama-Macbeth logistic relationships between dividend-decision variables and their determinant factors, and results are divided

[9] The time dummy is also controlled by using dividend premium as one of the explanatory variables, because dividend premium is a yearly variable and all firms have the same value of dividend premium in the same fiscal year.

[10] As the robustness' check of our methodology, we also tried one-step fixed-effect logistic regression and random-effect logistic logistic regression instead of Fama-Macbeth logistic regression, and find similar results.

respectively into several panels. The first part (Panel A) in each table is the result from the Fama-Macbeth logistic regression of dividend decision (*Newpayer* in Table 3.3, *divcontinue* in Table 3.4, *divincrease* in Table 3.5, and *Payer* in Table 3.6) on conventional factors including size, investment opportunities, profitability, and risk factors. *NYP* is the same to Fama and French (2001), and it represents a firm's size. *M/B* ratio at fiscal year *t*, *M/B* ratio at fiscal year *t*-1, and $\Delta A/A$ are proxies for firms' growth opportunities. *E/A* represents firms' current profitability, and it could also be viewed as a variable of current earnings performance. We apply Hoberg and Prabhala (2009)'s risk factors in Baker and Wurgler (2004a) method in Panel A of each table, but give both results with or without controlling risk factors for checking robustness. Hoberg and Prabhala (2009) argue that risks are major dividend determinants. They found evidence that Baker and Wurgler (2004a)'s dividend premium could be explained by firms' risks calculated by usingfirms' market returns, and then they argue that risks as fundamental determinants of payout policy are explaining firms' changes in propensity to pay dividends,while the catering incentive proxy by dividend premium loss its explanatory power after controlling for risks. Therefore, we include Hoberg and Prabhala (2009)'s risk factors in the first stage regression as they do in their paper, and test dividend premium after controlling for risks under all different dividend decisions discussed. We completely follow Hoberg and Prabhala (2009)'s method in creating firm systematic risk as the standard deviation of the predicted value from a conventional CAPM for a firm, and idiosyncratic risk asthe standard deviation of the residuals from a conventional CAPM for a firm. Considering the factor that Baker and Wurger (2004a) mainly discuss propensity to initiate (*PTI*) and the catering theory, and Hoberg and Prabhala (2009) test ΔPTI's relation with catering theory as a robustness check, we use *PTI* as the dependent variable in Panel B and Panel C of Table 3.3 and ΔPTI as a dependent variable in Panel D and Panel E of Table 3.3. However, Hoberg and Prabhala (2009) focus on changes in propensity to pay ΔPTP, so we use ΔPTP as a dependent variable in Table 3.7. Table 3.4 and Table 3.5 use respectively PTC and PTIN as dependent variables in their Panel B and Panel C. All panels after Panel A in each table allow us to compare the effect of investors' sentiment on firms' pay-out decisions with the effect of managers' extrapolation on firms' pay-out decisions.

Table 3.3 Decision of being new dividend payers and determining factors from 1963 to 2000

Table 3.3 reports the two-step regression of firm's' dividend decisions on conventional factors, dividend premium and optimistic past earning performance. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to initiate (*PTI*). At second step we use pooled method to regression PTI on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B, Panel C, Panel D, and Panel E which respectively report *PTI* without controlling for risks, ΔPTI without controlling for risks, *PTI* after controlling for risks, and ΔPTI after controlling for risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: Newpayer

Intercept	*NYP*	*ΔA/A*	*M/B*	*E/A*	*Sys risk*	*Idi risk*
-3.00***(-11.07)	1.46***(6.91)	0.13(0.58)	-0.92***(-3.72)	9.63***(6.14)		
-1.52***(-4.56)	1.06***(3.83)	0.06(0.21)	-0.88***(-3.70)	9.35***(6.26)	-41.93**(-2.69)	-38.05***(-5.98)

Panel B. PTI without controlling risk factors

Intercept	*VW* P^{D-ND}	*EPSG (1-5)*	*EPSG(1,5)*	*EPSG(1-3)*	*EPSG(1,3)*	*N*	R^2
0.021***(5.60)	0.16***(13.82)	0.01(1.28)				19709	0.01
0.06 (1.50)	0.10***(10.68)		0.02***(6.65)			22254	0.01
0.02***(5.47)	0.14***(16.09)			0.01***(3.84)		28150	0.01
3.26E-3 (1.07)	0.10***(13.01)				0.02***(8.46)	30095	0.01
Panel C. PTI after controlling risk factors							
0.03***(7.31)	0.17***(14.86)	0.01(0.88)				19131	0.02
0.02***(5.01)	0.17***(15.60)		0.02***(6.37)			20634	0.02
0.02***(7.24)	0.16***(17.22)			0.01***(3.50)		27322	0.01
0.01***(4.41)	0.16***(17.58)				0.02***(8.06)	28220	0.02

Table 3.3 (continue)

Panel D. ΔPTI without controlling risk factors							
Intercept	***VW*** P^{D-ND}	***EPSG (1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	R^2
0.06***(14.75)	0.17***(14.68)	0.03***(3.88)				18687	0.02
0.04***(9.17)	0.17***(15.69)		0.04***(13.37)			20125	0.03
0.05***(16.21)	0.16***(17.45)			0.03***(9.41)		26896	0.02
0.03***(9.94)	0.16***(17.85)				0.04***(16.44)	27746	0.03
Panel E. ΔPTI after controlling risk factors							
0.06***(14.82)	0.16***(13.98)	0.03***(3.79)				18133	0.02
0.04***(9.56)	0.16***(14.98)		0.04***(12.37)			19511	0.02
0.05***(16.1)	0.15***(16.49)			0.03***(9.03)		26099	0.02
0.03***(10.21)	0.15***(16.90)				0.04***(15.30)	26896	0.02

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

The first essential finding from Panel A in Table 3.3 is that all conventional factors show a significant impact on firms' dividend decision of becoming new payers, and their correlating direction (positive or negative) are the same as was discussed in previous research (see Baker and Wurgler, 2004a; Hoberg and Prabhala, 2009). Firms with large size, higher profitability, and lower idiosyncratic risk tend to pay dividends. Panel C and Panel E in Table 3.3 show different findings from Hoberg and Prabhala (2009) in results that dividend premium's significant effect on *PTI* or Δ*PTI* are robust after controlling for risk factors in step 1. The magnitudes of dividend premium's impact on *PTI* or Δ*PTI* are even mostly higher than the magnitudes of managers' extrapolations on *PTI* or Δ*PTI*, although managers' extrapolations also exhibit robust significant impact on *PTI* or Δ*PTI*.

Table 3.4 Decision of continuing dividends and determining factors from 1963 to 2000

Table 3.4 reports the two-step regression of firm's' dividend decisions on conventional factors, dividend premium and optimistic past earning performance. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to continue (*PTC*). At second step we use pooled method to regression *PTC* on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B and Panel C, which respectively report *PTC* without controlling for risks and *PTC* after controlling for risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: Divcontinue							
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
1.25***(6.62)	3.97***(10.84)	1.70***(5.31)	0.32(1.51)	12.19***(5.53)			
2.70***(11.83)	3.57***(9.45)	1.38***(5.41)	0.67***(3.53)	11.63***(5.15)	-58.25***(-3.94)	-45.02***(-10.42)	
Dependent variable: PTC; Controlling industry fixed effect							
Panel B. PTC without controlling risk factors							
Intercept	***VW P^{D-ND}***	***EPSG (1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	***R^2***
-0.01***(-3.78)	2.31E-3 (0.34)	0.01**(1.99)				32197	0.00
-0.03***(-9.69)	2.82E-3 (0.46)		0.03***(14.29)			33969	0.01
-0.01***(-5.35)	-5.50E-4 (-0.09)			0.02***(6.55)		37631	0.01
-0.03***(-11.42)	-2.33E-3 (-0.40)				0.03***(16.55)	38762	0.01
Panel C. PTC after controlling risk factors							
-0.01***(-3.18)	0.01(1.21)	0.01*(1.65)				31346	0.00
-0.02***(-7.87)	4.56E-3 (0.72)		0.02***(12.6)			32703	0.01
-0.01***(-4.70)	0.01(0.98)			0.01***(5.89)		36650	0.01
-0.03***(-9.46)	2.95E-4 (0.05)				0.03***(14.97)	37377	0.01

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

In Table 3.4, all conventional variables show significant impact on firms' decisions of continuing to pay dividends. Firms' investment opportunities, as proxied by asset growth and M/B, exhibit significant positive relations with dividend continuation, consistent with Baker and Wurgler (2004a)'s findings.

Panel B of Table 3.4 shows that firms tend to continue dividends when they have experienced earnings growth over the past three or five years, after considering the impact of dividend premium. Dividend premium does not show robust and significantly positive effects on *PTC*. The coefficient magnitudes and t-values of these over-extrapolation variables are all higher than that of dividend premium, indicating the strong economic and statistical significance of managerial overreaction on dividend continuation.

Another dividend decision is dividend change. Baker and Wurgler (2004a) report an insignificant relationship between catering factor and changes in dividend amounts, but Li and Lie (2006) find that managers cater for investors' demand in dividends by changing dividend amounts. We test catering theory and extrapolation theory in terms of affecting the decision of increasing dividends at the same time by replacing *PTI* with *PTIN* (propensity to increase dividends). If Hypothesis 1 holds, past dividend-payers who extrapolate previously growing EPS into the future may also feel optimistic in increasing dividends, since future high-growing profitability can support more dividend payments.

Table 3.5 Decision of increasing dividends and determining factors from 1963 to 2000

Table 3.5 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to increase dividends (*PTIN*). At second step we use pooled method to regression *PTIN* on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B and Panel C which respectively report *PTIN* without controlling risks and *PTIN* after controlling risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: Divincrease							
Intercept	**Size**	**Δ*A/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-1.08***(-8.82)	0.79***(9.15)	0.71***(4.87)	-0.14***(-2.97)	9.61***(13.99)			
-0.77***(-5.33)	0.75***(8.62)	0.81***(6.47)	-0.11**(-2.58)	9.50***(13.76)	-13.94(-1.39)	-11.05***(-5.16)	
Dependent variable: PTIN; Controlling industry fixed effect							
Panel B. PTIN without controlling risk factors							
Intercept	***VW P^{D-ND}***	***EPSG (1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	***R^2***
0.01**(2.02)	0.24***(13.36)	0.09***(7.92)				33119	0.01
-0.04***(-5.03)	0.19***(11.75)		0.09***(18.26)			34991	0.02
0.01**(2.08)	0.24***(14.77)			0.11***(17.18)		38852	0.02
-0.03***(-5.06)	0.20***(12.98)				0.12***(24.99)	40051	0.02
Panel C. PTIN after controlling risk factors							
Intercept	***VW P^{D-ND}***	***EPSG (1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***		
0.02***(2.92)	0.26***(13.98)	0.08***(7.47)				32242	0.01
-0.03***(-3.61)	0.22***(12.51)		0.09***(17.63)			33654	0.02
0.02***(2.75)	0.26***(15.4)			0.10***(16.82)		37838	0.02
-0.03***(-3.94)	0.22***(13.81)				0.12***(24.38)	38590	0.02

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

Table 3.5 reports that firms with past earnings growth tend to increase dividends, when risk factors and dividend premium are both controlled. Proxy of investor sentiment: dividend premium shows a robust and significant positive effect on *PTC*. In terms of fundamental factors, large and profitable firms tend to increase dividends, while firms with high asset growing rate tend not to increase dividends. Impact from *M/B* is not robust when risk factors are added in the regression. Systematic risk loses its significant impact on decisions to increase dividends, but idiosyncratic risk still negatively affects decisions to increase dividends.

Table 3.6 Decision of being dividend payers and determining factors from 1963 to 2000

Table 3.6 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to pay (*PTP*). At second step we use pooled method to regression Δ*PTP* on Baker and Wurgler (2004a)'s dividend premium (VW $\mathrm{P}^{\mathrm{D-ND}}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B and Panel C which respectively report Δ*PTP* without controlling risks and Δ*PTP* after controlling risk factors on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: Payer

Intercept	*NYP*	*ΔA/A*	*M/B*	*E/A*	*Sys risk*	*Idi risk*
-0.51***(-2.92)	4.29***(26.11)	-0.60***(-2.92)	-0.78***(-10.93)	11.43***(6.63)		
2.15***(6.18)	3.68***(13.23)	-0.97***(-5.42)	-0.47***(-6.69)	9.22***(5.83)	-135.49***(-13.38)	-67.89***(-12.82)

Panel B. ΔPTP without controlling risk factors

Intercept	*VW* P^{D-ND}	*EPSG (1-5)*	*EPSG(1,5)*	*EPSG(1-3)*	*EPSG(1,3)*	*N*	R^2
2.34E-3 (0.01)	0.03***(4.04)	0.03***(5.20)				51901	0.00
-0.04***(-11.93)	0.04***(4.96)		0.07***(32.61)			54816	0.02
-0.01**(-2.21)	0.02***(3.22)			0.04***(16.26)		65776	0.00
-0.04***(-14.95)	0.02***(3.44)				0.07***(39.56)	67439	0.02

Panel C. ΔPTP after controlling risk factors

Intercept	*VW* P^{D-ND}	*EPSG (1-5)*	*EPSG(1,5)*	*EPSG(1-3)*	*EPSG(1,3)*	*N*	R^2
-0.00(-0.74)	-0.01(-1.25)	0.02***(2.94)				50471	0.00
-0.03***(-8.06)	-4.84E-3 (-0.61)		0.05***(19.94)			53297	0.01
-4.36E-3 (-1.58)	-0.02***(-3.28)			0.03***(10.83)		63966	0.00
-0.03***(-10.64)	-0.02***(-3.31)				0.06***(27.72)	65550	0.01

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

We also test determinants of dividend-paying decisions, and test the impact of investors' sentiment and managers' extrapolation on changes in propensity to pay by following Hoberg and Prabhala (2009)'s regression models. Panel C in Table 3.6 reports the similar empirical evidence[11] as Hoberg and Prabhala (2009) who find that dividend premium's explanatory power disappears after controlling the risk factor in the first step of the Fama-Macbeth logistic regression. Extrapolation factors' explanatory power remains after controlling the risk factors' influence in changes of *PTP*.

The pooled method allows us to compare catering factor's (dividend premium's) impact with the impact from managers' extrapolation on dividend decisions in the same regression model in Table 3.4. No matter whether risk factors are controlled or not, dividend premium has a higher positive magnitude than extrapolation dummies. Coefficients for EPS-related dummies also have a higher t-value than dividend premium. It supports the argument (Hoberg and Prabhala, 2009) that catering theory can explain managers' decisions in becoming payers, only when risk factors are not controlled. As a summary of Table 3.4, managers' extrapolations have significant explanatory power in ΔPTP, and this explanatory power is robust no matter whether risk factors are controlled, and when investors' sentiments are also controlled.

As a summary, we find supportive evidence of the catering theory in most circumstances albeit with several exceptions. In contrast, the significant effect of firms' good previous earnings performance is robust regardless of whether risk factors are controlled or not, or whether *PTI* or ΔPTI is used. This finding implies

[11] We find inconsistent significance for the impact of dividend premium on changes in firms' propensity to pay dividend.

that the effect of past experiences in EPS have a more robust and significant impact than catering factors on firms' dividend decisions of being dividend payers and being new payers, and this significant effect is not affected by risk factors.

As has been introduced and described in section 3, we create different dummies to represent firms' past profitability growth in the form of two different time horizons (three years and five years) and two different types of growth (YoY growth and general growth) for proving that our argument about firms' previously growing EPS on dividend decisions is robust. We use four different dummy variables to represent firms' past year-by-year increases in EPS for three years and five years (*EPSG(1-3)* and *EPSG(1-5)*), and past general increases in EPS which evaluate differences between EPS in the past three years or in the past five years and current EPS (*EPSG(1,3)* and *EPSG(1,5)*). We find that all of these alternative dummy variables, except for *EPSG(1-5)*, have significant impact on firms' *PTI, PTC, PTIN* and Δ*PTP*, after controlling firms' characteristics including profitability, risk factors and dividend premium's impact. Considering the fact that the condition used to create *EPSG(1-5)* is too strict to generate sufficient observation[12], *EPSG(1-5)*'s results can roughly be ignored. We can conclude that there is a robust relation between firms' historical earnings performance and managers' propensity to pay dividends after all of these empirical findings.

We find the same evidence with Fama and French (2001) and Baker and Wurgler (2004a) that firms' size and profitability are significantly positively related to firms' decisions of paying dividends given or without being given the condition that firms were non-payers at the last fiscal year. Whereas, investment opportunities

[12] We find that there are only several or no observations for firms with historical 5-year stable increasing EPS in some years, so regression based on this dummy variable can generate unconsolidated results.

proxy by market to book ratio (*M/B*) is negatively related to firms' decisions to pay dividends, while firms' investment opportunities proxy by asset growth rate ($\Delta A/A$) show no significant impact on firms' decisions of being dividend initiators, but significant negative relation with firms' decisions of being dividend payers. These findings relating to investment opportunities are consistent with Baker and Wurgler (2004a) and Hoberg and Prabhala (2009)'s findings. We find that risk factors are significantly negatively related to firms' decisions of being dividend payers or initiating dividends, and it is consistent with the finding of Hoberg and Prabhala (2009). However, we also find that risk factors' significant negative impact may become weaker, when we use alternative dependent variables which record firms' dividend status over the past three years or five years. In detail, firms' systematic risk positively relates with firms' decisions to initiate dividends (insignificant positive relationship for firms with past status of being non-dividend-payers for three years, and significant positive relationship for firms with past status of being non-dividend-payers for five years), and firms' idiosyncratic risk only have insignificant negative relationship with firms' decisions of being initiators for those firms with past status of being non-dividend-payers for three years. It may indicate relatively weak robustness of risk factors' impacting power when they are compared with other determinants of dividend policy.

3.5.2. Future profitability of firms who initiate/continue/increase/pay dividends

As a further check concerning managers' over-reaction which is reflected by the activity of over-extrapolation, we produce Table 3.7 for a clear and detailed look at statistics which are descriptive of firms' future earnings performance after managers make decisions to initiate/continue/increase/pay dividends with positive past earnings performance. If a further test is conducted for examining whether managers, who decide to make dividend decisions based on past experience of profitability growth, are over-optimistic, it is reasonable to focus on the sub-group with general positive EPS when managers have decided to pay dividends, but not on the sub-group with general negative EPS when firms have to choose not to pay under the limitation of negative profitability. Therefore, we focus on dividend payers and new dividend payers, and firms who continue dividends or increase dividends for investigating the further relation between past earnings growth and future earnings performance to examine whether managers are over-optimistic in making dividend decisions based on previous earnings experiences[13].

Table 3.7 reports on future means of *E/A* and on growth rates of *E/A*'s means for *Payer* and *Newpayer* who have experienced growing profitability. Table 3.12 is formed by using COMPUSTAT data ranging from 1963 to 2000. There are two sub-periods in Table 3.12: 1963-1978 and 1979-2000 for comparison based on Fama and French (2001)'s argument that there is a structure break around 1978.

[13] Our method in testing whether managers are overextrapolated is different from DeAngelo et al. (1996) in several ways. Compared with DeAngelo et al. (1996)'s sample, (1) this research has a more relaxed standard for sample selection which only requires firms to have past 3-year or 5-year strict increase or overall increase in EPS, because recent past 5-year accounting data is more remarkable than accounting data 10 years ago; (2) This research tests the future earnings performance of sample firms up to 5 years; (3) this research also analyses new dividend payers who are not payers at the last fiscal year (year -1) as well as firms who continue or increase dividends, when DeAngelo et al. (1996) only focus on dividend payers' dividend increases which require firms to be dividend payers in both current and last years.

Table 3.7 Future profitability of firms who have past increasing EPS and initiate/continue/increase/pay dividends

Table 3.7 reports means and growth rates of current profitability and future 5-year profitability for *Payer* and *Newpayer* with experiences of past earnings growth. *E/A* represents firm's profitability at current fiscal year, and *E/A (n)* represents firm's profitability in *n*-year. Growth rate is calculated by using current *E/A* minus *E/A* at previous fiscal year all divided by previous fiscal years' *E/A*. Means and growth rates of *E/A* are calculated within three groups based on the argument of Fama and French (2001) that there is a structure break around 1979: 1963-1978, 1979-2000, and 1963-2000.

Payer with EPSG(1-3)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.081		0.084		0.083	
E/A(-4)	0.078	-3.634	0.078	-7.037	0.078	-5.826
E/A(-3)	0.088	12.733	0.095	21.294	0.092	17.892
E/A(-2)	0.096	9.167	0.104	9.731	0.101	9.517
E/A(-1)	0.103	7.065	0.112	7.228	0.108	7.167
E/A	0.099	-4.099	0.102	-8.660	0.101	-6.934
E/A(+1)	0.096	-2.769	0.094	-8.089	0.095	-6.000
E/A(+2)	0.095	-0.394	0.087	-7.173	0.090	-4.337
E/A(+3)	0.097	1.197	0.082	-5.760	0.088	-2.652
E/A(+4)	0.096	-0.300	0.081	-0.917	0.088	-0.565
E/A(+5)	0.095	-1.118	0.079	-3.139	0.086	-2.138

New Payer with EPSG(1-3)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.048		0.033		0.039	
E/A(-4)	0.038	-21.445	0.013	-59.800	0.024	-38.387
E/A(-3)	0.066	75.515	0.061	364.705	0.063	161.403
E/A(-2)	0.083	24.848	0.086	41.101	0.085	33.429
E/A(-1)	0.100	20.189	0.111	28.858	0.106	25.029
E/A	0.100	0.478	0.095	-13.873	0.097	-7.780
E/A(+1)	0.092	-8.393	0.088	-8.077	0.089	-8.167
E/A(+2)	0.086	-6.498	0.057	-34.524	0.071	-20.797
E/A(+3)	0.092	7.449	0.028	-51.456	0.060	-15.545
E/A(+4)	0.087	-5.439	0.059	111.811	0.073	22.489
E/A(+5)	0.085	-3.058	0.055	-5.926	0.070	-3.953

Payer with EPSG(1,3)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.079		0.083		0.082	
E/A(-4)	0.079	-0.722	0.078	-6.821	0.078	-4.786
E/A(-3)	0.083	4.926	0.087	11.602	0.085	9.124
E/A(-2)	0.089	8.306	0.094	7.944	0.092	8.074
E/A(-1)	0.095	6.697	0.104	10.833	0.101	9.353
E/A	0.093	-2.175	0.093	-10.812	0.093	-7.797
E/A(+1)	0.092	-1.915	0.083	-10.035	0.086	-6.965
E/A(+2)	0.091	-1.167	0.078	-5.960	0.083	-3.956
E/A(+3)	0.091	0.013	0.074	-5.066	0.081	-2.836
E/A(+4)	0.090	-0.773	0.072	-3.108	0.079	-1.965
E/A(+5)	0.089	-1.225	0.070	-2.617	0.078	-1.875

New Payer with EPSG(1,3)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.053		0.042		0.046	
E/A(-4)	0.050	-4.258	0.039	-6.656	0.043	-4.814
E/A(-3)	0.056	10.772	0.047	20.884	0.051	16.299
E/A(-2)	0.068	21.744	0.063	32.939	0.065	28.081
E/A(-1)	0.091	33.945	0.100	59.944	0.097	49.219
E/A	0.095	3.907	0.091	-9.187	0.092	-4.338
E/A(+1)	0.087	-8.290	0.058	-36.189	0.070	-24.772
E/A(+2)	0.080	-8.496	0.060	2.657	0.068	-2.546
E/A(+3)	0.088	10.356	0.049	-17.007	0.065	-3.585
E/A(+4)	0.082	-6.992	0.051	2.869	0.064	-1.938
E/A(+5)	0.083	1.337	0.057	12.359	0.068	6.493

Payer with EPSG(1-5)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.085		0.096		0.092	
E/A(-4)	0.090	5.617	0.103	6.686	0.098	6.342
E/A(-3)	0.094	4.475	0.109	5.845	0.104	5.408
E/A(-2)	0.099	5.437	0.113	4.096	0.108	4.519
E/A(-1)	0.104	4.828	0.117	3.740	0.113	4.087
E/A	0.103	-1.187	0.111	-5.654	0.108	-4.220
E/A(+1)	0.102	-0.535	0.104	-5.652	0.104	-3.973
E/A(+2)	0.102	-0.146	0.097	-7.013	0.099	-4.582
E/A(+3)	0.103	0.922	0.093	-4.108	0.097	-2.178
E/A(+4)	0.103	-0.467	0.092	-1.386	0.096	-0.956
E/A(+5)	0.100	-2.291	0.088	-4.106	0.093	-3.346

New Payer with EPSG(1-5)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.056		0.050		0.052	
E/A(-4)	0.065	17.172	0.056	10.619	0.059	13.293
E/A(-3)	0.072	9.581	0.094	68.096	0.085	43.403
E/A(-2)	0.082	14.142	0.100	7.161	0.093	9.412
E/A(-1)	0.094	14.267	0.119	18.870	0.109	17.321
E/A	0.099	5.635	0.087	-27.111	0.091	-16.382
E/A(+1)	0.091	-7.907	0.097	11.940	0.095	3.702
E/A(+2)	0.080	-11.538	0.010	-89.980	0.039	-58.781
E/A(+3)	0.082	2.264	0.033	-433.878	0.019	-51.751
E/A(+4)	0.089	8.126	0.026	-181.044	0.055	191.685
E/A(+5)	0.101	13.808	0.064	143.739	0.080	46.286

Payer with EPSG(1,5)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.077		0.083		0.081	
E/A(-4)	0.080	3.571	0.088	5.384	0.085	4.842
E/A(-3)	0.083	3.998	0.092	4.990	0.089	4.695
E/A(-2)	0.088	5.569	0.097	4.719	0.094	4.968
E/A(-1)	0.094	6.769	0.104	7.587	0.101	7.346
E/A	0.092	-1.547	0.093	-10.679	0.093	-8.000
E/A(+1)	0.091	-1.301	0.085	-8.079	0.087	-5.910
E/A(+2)	0.090	-0.640	0.080	-6.373	0.083	-4.361
E/A(+3)	0.091	0.889	0.075	-5.762	0.081	-3.286
E/A(+4)	0.090	-1.495	0.073	-2.831	0.079	-2.202
E/A(+5)	0.086	-3.717	0.071	-2.508	0.077	-2.877

New Payer with EPSG(1,5)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.049		0.039		0.042	
E/A(-4)	0.051	2.268	0.048	24.019	0.049	15.424
E/A(-3)	0.055	8.659	0.054	11.635	0.054	10.595
E/A(-2)	0.064	15.869	0.067	24.939	0.066	21.825
E/A(-1)	0.087	37.285	0.102	52.665	0.097	47.643
E/A	0.093	6.825	0.094	-8.212	0.094	-3.647
E/A(+1)	0.086	-7.880	0.067	-28.009	0.074	-21.149
E/A(+2)	0.083	-3.745	0.060	-11.588	0.068	-8.090
E/A(+3)	0.088	6.277	0.052	-12.233	0.065	-4.283
E/A(+4)	0.078	-11.106	0.056	7.641	0.064	-0.996
E/A(+5)	0.081	4.077	0.051	-10.364	0.062	-3.700

Divincrease with EPSG(1-3)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.081		0.084		0.083	
E/A(-4)	0.078	-3.634	0.078	-7.037	0.078	-5.826
E/A(-3)	0.088	12.733	0.095	21.294	0.092	17.892
E/A(-2)	0.096	9.167	0.104	9.731	0.101	9.517
E/A(-1)	0.103	7.065	0.112	7.228	0.108	7.167
E/A	0.099	-4.099	0.102	-8.660	0.101	-6.934
E/A(+1)	0.096	-2.769	0.094	-8.089	0.095	-6.000
E/A(+2)	0.095	-0.394	0.087	-7.173	0.090	-4.337
E/A(+3)	0.097	1.197	0.082	-5.760	0.088	-2.652
E/A(+4)	0.096	-0.300	0.081	-0.917	0.088	-0.565
E/A(+5)	0.095	-1.118	0.079	-3.139	0.086	-2.138

Divcontinue with EPSG(1-3)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.048		0.033		0.039	
E/A(-4)	0.038	-21.445	0.013	-59.800	0.024	-38.387
E/A(-3)	0.066	75.515	0.061	364.705	0.063	161.403
E/A(-2)	0.083	24.848	0.086	41.101	0.085	33.429
E/A(-1)	0.100	20.189	0.111	28.858	0.106	25.029
E/A	0.100	0.478	0.095	-13.873	0.097	-7.780
E/A(+1)	0.092	-8.393	0.088	-8.077	0.089	-8.167
E/A(+2)	0.086	-6.498	0.057	-34.524	0.071	-20.797
E/A(+3)	0.092	7.449	0.028	-51.456	0.060	-15.545
E/A(+4)	0.087	-5.439	0.059	111.811	0.073	22.489
E/A(+5)	0.085	-3.058	0.055	-5.926	0.070	-3.953

Divincrease with EPSG(1,3)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.079		0.083		0.082	
E/A(-4)	0.079	-0.722	0.078	-6.821	0.078	-4.786
E/A(-3)	0.083	4.926	0.087	11.602	0.085	9.124
E/A(-2)	0.089	8.306	0.094	7.944	0.092	8.074
E/A(-1)	0.095	6.697	0.104	10.833	0.101	9.353
E/A	0.093	-2.175	0.093	-10.812	0.093	-7.797
E/A(+1)	0.092	-1.915	0.083	-10.035	0.086	-6.965
E/A(+2)	0.091	-1.167	0.078	-5.960	0.083	-3.956
E/A(+3)	0.091	0.013	0.074	-5.066	0.081	-2.836
E/A(+4)	0.090	-0.773	0.072	-3.108	0.079	-1.965
E/A(+5)	0.089	-1.225	0.070	-2.617	0.078	-1.875

Divcontinue with EPSG(1,3)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.053		0.042		0.046	
E/A(-4)	0.050	-4.258	0.039	-6.656	0.043	-4.814
E/A(-3)	0.056	10.772	0.047	20.884	0.051	16.299
E/A(-2)	0.068	21.744	0.063	32.939	0.065	28.081
E/A(-1)	0.091	33.945	0.100	59.944	0.097	49.219
E/A	0.095	3.907	0.091	-9.187	0.092	-4.338
E/A(+1)	0.087	-8.290	0.058	-36.189	0.070	-24.772
E/A(+2)	0.080	-8.496	0.060	2.657	0.068	-2.546
E/A(+3)	0.088	10.356	0.049	-17.007	0.065	-3.585
E/A(+4)	0.082	-6.992	0.051	2.869	0.064	-1.938
E/A(+5)	0.083	1.337	0.057	12.359	0.068	6.493

Divincrease with EPSG(1-5)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.085		0.096		0.092	
E/A(-4)	0.090	5.617	0.103	6.686	0.098	6.342
E/A(-3)	0.094	4.475	0.109	5.845	0.104	5.408
E/A(-2)	0.099	5.437	0.113	4.096	0.108	4.519
E/A(-1)	0.104	4.828	0.117	3.740	0.113	4.087
E/A	0.103	-1.187	0.111	-5.654	0.108	-4.220
E/A(+1)	0.102	-0.535	0.104	-5.652	0.104	-3.973
E/A(+2)	0.102	-0.146	0.097	-7.013	0.099	-4.582
E/A(+3)	0.103	0.922	0.093	-4.108	0.097	-2.178
E/A(+4)	0.103	-0.467	0.092	-1.386	0.096	-0.956
E/A(+5)	0.100	-2.291	0.088	-4.106	0.093	-3.346

Divcontinue with EPSG(1-5)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.056		0.050		0.052	
E/A(-4)	0.065	17.172	0.056	10.619	0.059	13.293
E/A(-3)	0.072	9.581	0.094	68.096	0.085	43.403
E/A(-2)	0.082	14.142	0.100	7.161	0.093	9.412
E/A(-1)	0.094	14.267	0.119	18.870	0.109	17.321
E/A	0.099	5.635	0.087	-27.111	0.091	-16.382
E/A(+1)	0.091	-7.907	0.097	11.940	0.095	3.702
E/A(+2)	0.080	-11.538	0.010	-89.980	0.039	-58.781
E/A(+3)	0.082	2.264	0.033	-433.878	0.019	-51.751
E/A(+4)	0.089	8.126	0.026	-181.044	0.055	191.685
E/A(+5)	0.101	13.808	0.064	143.739	0.080	46.286

Divincrease with EPSG(1,5)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.077		0.083		0.081	
E/A(-4)	0.080	3.571	0.088	5.384	0.085	4.842
E/A(-3)	0.083	3.998	0.092	4.990	0.089	4.695
E/A(-2)	0.088	5.569	0.097	4.719	0.094	4.968
E/A(-1)	0.094	6.769	0.104	7.587	0.101	7.346
E/A	0.092	-1.547	0.093	-10.679	0.093	-8.000
E/A(+1)	0.091	-1.301	0.085	-8.079	0.087	-5.910
E/A(+2)	0.090	-0.640	0.080	-6.373	0.083	-4.361
E/A(+3)	0.091	0.889	0.075	-5.762	0.081	-3.286
E/A(+4)	0.090	-1.495	0.073	-2.831	0.079	-2.202
E/A(+5)	0.086	-3.717	0.071	-2.508	0.077	-2.877

Divcontinue with EPSG(1,5)

	63-78		79-00		63-00	
	Mean	Grow rates %	Mean	Grow rates %	Mean	Grow rates %
E/A(-5)	0.049		0.039		0.042	
E/A(-4)	0.051	2.268	0.048	24.019	0.049	15.424
E/A(-3)	0.055	8.659	0.054	11.635	0.054	10.595
E/A(-2)	0.064	15.869	0.067	24.939	0.066	21.825
E/A(-1)	0.087	37.285	0.102	52.665	0.097	47.643
E/A	0.093	6.825	0.094	-8.212	0.094	-3.647
E/A(+1)	0.086	-7.880	0.067	-28.009	0.074	-21.149
E/A(+2)	0.083	-3.745	0.060	-11.588	0.068	-8.090
E/A(+3)	0.088	6.277	0.052	-12.233	0.065	-4.283
E/A(+4)	0.078	-11.106	0.056	7.641	0.064	-0.996
E/A(+5)	0.081	4.077	0.051	-10.364	0.062	-3.700

Table 3.7 records the past five-year earnings, current earnings and future five-year earnings performance for dividend payers, new dividend payers, dividend-continuation firms, and dividend-increase firms who experience past earnings growths. All *Payer* and *Newpayer* firms exhibit decreases in E/A in the five years except some groups with *EPSG(1-5)* which have a limited number of observations. Table 3.7 reports that future *E/A* for *Payer* within 1963-1979 are different from future E/A for *Payer* within 1979 to 2000. We can still observe one-to-two years increase in E/A for *Payer* within 1963-1978, but future E/A for *Payer* with *EPSG(n)* within 1979-2000 are continuing to decrease through the following five years. Compared with *Payer* with *EPSG(n), Newpayer* with *EPSG(n)* shows decreasing *E/A* for the first two years after experiencing past earnings growth, but usually reverses with increasing *E/A* in four years and/or in five years. Although these reverses may indicate that firms, who are affected by past experience in growing EPS and then decide to initiate dividends, are more rational than the group of *Payer* with *EPSG(n)* in forecasting future earnings performance, the aggregated levels of E/A are still decreasing for these *Newpayer,* and we cannot conclude that *Newpayer* are not over-optimistic in extrapolating future earnings performance. Similar to groups of *Payer*, groups of *Divincrease* within 1979-2000 have YoY decreasing *E/A*, while groups of *Divincrease* within 1963-1978 have not such a YoY decrease in *E/A*. However, all *Divincrease* groups show general decrease in *E/A* from current year t to the end of year t+5. Because *Divcontinue* firms also include ones who may be pessimistic regarding future earnings performance and choose to decrease dividends, no YoY decrease in *E/A* for *Divcontinue* firms can be found. Nevertheless, all *Divcontinue* groups have general decreasing future *E/A* from current year t to year t+5, too.

Generally Table 3.7 shows that firms' growth in EPS cannot be stable in the long run. If it is true that managers are incorrect in extrapolating future earnings growth, and they also try to use dividends for the purpose of signalling, then they are over-optimistic. It seems that managers are not as over-optimistic in signalling to investors by using dividends during the time period of 1963-1978 as in signalling by using dividends in 1979-2000. Managers are becoming more sentimental and over-optimistic in recent years than previously.

In summary, Table 3.7 reports managers' over-reactions. Managers are more likely to over-react in the later time period than in the earlier time period. No matter whether it is the payout decision of being dividend payers, being new dividend payers, continuing dividends, or increasing dividends that is being considered, the statistic descriptive table with combined conditions will lead to the same conclusion.

3.5.3. Other dividend decisions: dividend omission and dividend decrease

3.5.3.1. Is dividend omission affected by decrease in past earnings?

After we provide the empirical evidence that past earnings growth is positively related with managers' decisions to begin paying dividends, we try to answer another interesting question: Is dividend omission also affected by long-term decrease in earnings over the past three years or five years? We create four new dummy variables which are the opposite of the EPSG series. These variables are: (1) five-year year-on-year decreases (YoY decreases) (*EPSG(1-5)*) in past earnings, three-year YoY decreases (*EPSG(1-3)*) in earnings, five-year general earnings' decreases ignoring fluctuations within the past five-year period (*EPSD(1,5)*), and three-year general decreases ignoring fluctuations within the past three-year period

(*EPSD(1,3)*). (See Appendix 3.2 for details of these EPS-related dummies.) We use the same method in running regression models with the exception that we replace EPSG series variables with EPSD series variables, and replace the dependent variable with the dependent variable of omitting dividends or not.

Table 3.8 Decision of omitting payers and determining factors from 1963 to 2000

Table 3.8 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to omit dividends (*PTO*). At second step we use pooled method to regression *PTO* on Baker and Wurgler (2004a)'s dividend premium (*VW* P^{D-ND}) and dummy variables which represent firms' past declines in EPS (*EPSD(1-3), EPSD(1,3), EPSD(1-5),* and *EPSD(1,5)*). The second step is divided into Panels B and Panel C which respectively report *PTO* without controlling risks and *PTO* after controlling risks on VW P^{D-ND} and indicator of firms' past declines in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: Divomission							
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-0.87***(-2.89)	-3.72***(-6.99)	-3.08***(-5.26)	-0.94**(-2.61)	-11.68***(-3.31)			
-3.14***(-8.31)	-3.29***(-5.14)	-2.50***(-4.70)	-1.63***(-3.83)	-13.00***(-3.15)	107.25***(4.63)	77.53***(7.49)	
Panel B. PTO without controlling risk factors							
Intercept	***VW*** P^{D-ND}	***EPSD (5)***	***EPSD(1,5)***	***EPSD(1-3)***	***EPSD(1,3)***	***N***	R^2
0.01***(3.51)	-2.40E-3 (-0.36)	0.04***(3.28)				32197	0.00
1.49E-3 (0.52)	-3.08E-3 (-0.50)		0.03***(13.41)			33969	0.01
0.01***(2.66)	2.38E-3 (0.38)			0.06***(15.88)		37631	0.01
9.37E-4 (0.36)	1.88E-3 (0.32)				0.03***(15.75)	38762	0.01
Panel C. PTO after controlling risk factors							
0.01***(2.94)	-0.01(-1.21)	0.05***(4.09)				31346	0.00
-1.33E-3 (-0.47)	-4.56E-3 (-0.72)		0.02***(12.6)			32703	0.01
0.01**(2.19)	-4.15E-3 (-0.66)			0.06***(15.49)		36650	0.01
-2.12E-3 (-0.82)	-2.95E-4 (-0.05)				0.03***(14.97)	37377	0.01

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

Table 3.8 shows that dividend omission is positively related to firms' past decrease in earnings, after controlling for fundamental factors and risk factors. The impact from firms' past depreciating performance in earnings on dividend omission is robust when different alternative EPSD series dummies are used, or whether risk factors are controlled. The catering factor has no significant impact on *PTO*. Therefore, these results suggest that decreases in past earnings have significant impact on managers' decisions of omitting dividends, and this extrapolation based on past poor performance in earnings has a stronger explanatory power than managers' catering incentive: dividend premium.

3.5.3.2. Dividend decrease

We also test whether firms with previously decreasing earnings tend to decrease dividends by replacing *PTO* with *PTD* (propensity to decrease dividends). Table 3.9 shows that dividend premium has a robust and significantly negative effect on firms' propensity to decrease dividends. On the other hand, the significance of managers' extrapolations on explaining *PTD* sensitively depends on which decreasing type is chosen. If only groups with YoY decreases in EPS are considered, the positive impact of decreasing EPS on *PTD* is significant and robust.

Table 3.9 Decision of decreasing determinants and determining factors from 1963 to 2000

Table 3.9 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to omit dividends (*PTD*). At second step we use pooled method to regression *PTD* on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' past declines in EPS (*EPSD(1-3), EPSD(1,3), EPSD(1-5),* and *EPSD(1,5)*). The second step is divided into Panels B and Panel C which respectively report *PTD* without controlling risk factors and *PTD* after controlling risks on $VW\ P^{D-ND}$ and indicators of firms' past declines in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: Divdecrease							
Intercept	***NYP***	***ΔA/A***	**M/B**	**E/A**	**Sys risk**	**Idi risk**	
-0.87***(-8.71)	-0.91***(-10.39)	-0.28(-1.49)	0.44***(9.90)	-7.30***(-7.20)			
-2.10***(-6.63)	0.16(0.23)	-0.11(-0.37)	-0.13(-0.25)	3.28(0.34)	-22.22(-0.61)	27.59***(10.36)	
Panel B. PTD without controlling risk factors							
Intercept	$VW\ P^{D-ND}$	***EPSG (1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	R^2
-9.84E-4 (-0.15)	-0.12***(-7.49)	0.14***(4.46)				32197	0.00
0.01 (1.58)	-0.10***(-6.81)		-2.22E-3 (-0.50)			33969	0.00
-4.92E-3 (-0.86)	-0.10***(-7.23)			0.09***(10.5)		37631	0.01
2.17E-3 (0.36)	-0.09***(-7.02)				0.01***(2.79)	38762	0.00
Panel C. PTD after controlling risk factors							
0.04***(5.98)	-0.19***(-11.76)	0.21***(6.65)				31346	0.00
0.03***(4.35)	-0.17***(-11.07)		0.03***(7.21)			32703	0.01
0.03***(5.80)	-0.17***(-11.70)			0.14***(15.35)		36650	0.01
0.02***(3.86)	-0.16***(-11.06)				0.05***(10.96)	37377	0.01

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

In summary, managers' extrapolations proxy by firms' previously earnings patterns not only have robust significant influence on managers' decisions to pay/initiate/increase dividends, but also have strong explanatory power in affecting firms' propensity to omit or decrease dividends. Jointly analysed with results from the regression of *PTO* on EPSD series variables, and PTD on EPSD series variables, managers' activities of extrapolation play an important role in explaining managers' dividend decisions. In addition, managerial extrapolation factors can win in most "horse races" with recently-developed explanatory factors like risk factors and the catering factor.

3.5.4. Future profitability of firms who omit/decrease dividends

Similar to Section 3.2, we conduct further checks regarding managers' over-reaction which is reflected by the activity of extrapolating past EPS's declines into the future. We produce Table 3.10 for a clear and detailed look at statistics descriptive of firms' future earnings performance after managers make decision to omit/decrease dividends after experiencing previously persistent decreases in EPS. Since firms may cut dividends to invest money in extending their capitals, the means of asset growth from the past five years to the future five years are also listed in Table 3.10 for examining whether firms who omit/decrease dividends are re-investing and extending themselves.

Table 3.10 Future profitability and future investment of firms who have past decreasing EPS and omit/decrease dividends

Table 3.10 reports means and growth rates of current profitability and future 5-year profitability for *Divomissions* and *Divdecreases* with experiences of past earnings deduction. *E/A* represents firm's profitability at current fiscal year, and *E/A (n)* represents firm's profitability in *n*-year. Growth rate is calculated by using current *E/A* minus *E/A* at previous fiscal year all divided by previous fiscal years' *E/A*. Means and growth rates of *E/A* are calculated within three groups based on the argument of Fama and French (2001) that there is a structure break around 1979: 1963-1978, 1979-2000, and 1963-2000. We show the same things for Δ*A/A* as the proxy of investment.

Divomission with EPSG(1-3)

	63-78		79-00		63-00	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.083		0.097		0.094	
E/A(-4)	0.095	14.325	0.111	14.223	0.107	13.711
E/A(-3)	0.073	-22.806	0.081	-26.996	0.079	-26.073
E/A(-2)	0.052	-28.655	0.044	-46.010	0.046	-42.019
E/A(-1)	0.005	-109.114	0.034	-177.409	0.027	-158.084
E/A	0.013	-374.778	0.006	-81.788	0.001	-94.797
E/A(+1)	0.041	215.821	0.008	-224.751	0.017	-1314.775
E/A(+2)	0.066	58.957	0.030	286.472	0.040	137.282
E/A(+3)	0.066	1.421	0.033	9.935	0.043	7.333
E/A(+4)	0.051	-22.897	0.040	22.350	0.044	1.847
E/A(+5)	0.057	10.493	0.047	17.618	0.050	15.414
ΔA/A(-5)	0.106	87.904	0.096	104.113	0.098	94.931
ΔA/A(-4)	0.177	65.928	0.131	37.051	0.141	43.972
ΔA/A(-3)	0.148	-16.450	0.114	-13.432	0.122	-13.502
ΔA/A(-2)	0.062	-57.774	0.055	-51.366	0.057	-53.289
ΔA/A(-1)	0.021	-133.747	0.063	-213.504	0.052	-191.863
ΔA/A	0.119	467.318	0.078	23.815	0.088	68.021
ΔA/A(+1)	0.028	-76.375	0.097	25.084	0.078	-10.897
ΔA/A(+2)	0.063	-322.202	0.056	-42.556	0.025	-68.081
ΔA/A(+3)	0.074	18.160	0.015	-127.036	0.030	-221.617
ΔA/A(+4)	0.020	-72.448	0.031	103.091	0.028	-8.254
ΔA/A(+5)	0.025	21.594	0.020	-35.016	0.021	-24.212

Divdecrease with EPSG(1-3)

	63-78		79-00		63-00	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.092		0.105		0.102	
E/A(-4)	0.100	8.511	0.117	10.566	0.112	9.779
E/A(-3)	0.085	-14.942	0.093	-19.920	0.091	-18.817
E/A(-2)	0.066	-21.615	0.066	-29.687	0.066	-27.813
E/A(-1)	0.029	-55.593	0.010	-84.632	0.015	-77.314
E/A	0.037	25.776	0.020	101.014	0.024	63.897
E/A(+1)	0.056	50.018	0.034	67.195	0.040	61.712
E/A(+2)	0.073	30.866	0.040	17.268	0.049	23.048
E/A(+3)	0.072	-1.412	0.045	13.835	0.053	8.267
E/A(+4)	0.057	-20.215	0.051	12.664	0.053	0.198
E/A(+5)	0.063	9.765	0.054	5.257	0.056	6.956
ΔA/A(-5)	0.091	44.421	0.104	94.435	0.101	79.340
ΔA/A(-4)	0.143	57.775	0.128	22.265	0.131	29.401
ΔA/A(-3)	0.118	-17.376	0.102	-20.100	0.106	-19.143
ΔA/A(-2)	0.071	-40.445	0.064	-36.761	0.066	-37.788
ΔA/A(-1)	0.011	-85.097	0.019	-128.772	0.011	-117.112
ΔA/A	0.026	-347.508	0.022	18.051	0.023	103.042
ΔA/A(+1)	0.014	-153.523	0.035	58.219	0.022	-4.219
ΔA/A(+2)	0.067	379.411	0.007	-79.764	0.012	-155.266
ΔA/A(+3)	0.071	6.796	0.018	-359.095	0.032	163.120
ΔA/A(+4)	0.046	-35.408	0.030	67.895	0.035	8.100
ΔA/A(+5)	0.034	-25.637	0.040	29.649	0.038	10.548

Divomission with EPSG(1,3)

	63-78		79-00		63-00	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.068		0.081		0.078	
E/A(-4)	0.077	13.358	0.087	7.771	0.085	8.404
E/A(-3)	0.067	-12.333	0.072	-17.104	0.071	-16.093
E/A(-2)	0.053	-20.624	0.051	-29.368	0.052	-27.429
E/A(-1)	0.005	-91.196	0.020	-138.317	0.014	-126.871
E/A	0.015	226.973	0.000	-102.237	0.004	-128.439
E/A(+1)	0.037	140.291	0.019	4213.585	0.023	492.621
E/A(+2)	0.043	16.861	0.029	52.968	0.033	39.242
E/A(+3)	0.048	11.345	0.029	-1.215	0.034	3.815
E/A(+4)	0.045	-5.530	0.039	35.574	0.041	20.020
E/A(+5)	0.051	12.561	0.039	0.258	0.042	4.319
ΔA/A(-5)	0.056	10.137	0.082	112.202	0.077	81.312
ΔA/A(-4)	0.132	134.148	0.092	11.849	0.100	30.826
ΔA/A(-3)	0.111	-15.953	0.098	5.742	0.101	0.144
ΔA/A(-2)	0.079	-28.201	0.062	-36.423	0.066	-34.304
ΔA/A(-1)	0.014	-82.445	0.055	-188.229	0.039	-158.319
ΔA/A	0.069	-591.478	0.095	72.906	0.088	129.474
ΔA/A(+1)	0.026	-62.387	0.066	-30.470	0.056	-36.926
ΔA/A(+2)	0.022	-186.477	0.020	-70.260	0.009	-83.190
ΔA/A(+3)	0.050	123.679	0.019	-195.294	0.026	-380.290
ΔA/A(+4)	0.007	-85.588	0.039	109.220	0.031	18.652
ΔA/A(+5)	0.024	228.393	0.027	-29.731	0.027	-15.052

Divdecrease with EPSG(1,3)

	63-78		79-00		63-00	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.084		0.095		0.093	
E/A(-4)	0.089	5.873	0.101	6.525	0.098	6.087
E/A(-3)	0.084	-4.690	0.090	-11.436	0.088	-9.869
E/A(-2)	0.075	-11.751	0.077	-14.351	0.076	-13.710
E/A(-1)	0.050	-32.599	0.042	-45.293	0.044	-42.082
E/A	0.049	-3.344	0.044	3.760	0.045	1.669
E/A(+1)	0.062	27.156	0.054	23.318	0.056	24.529
E/A(+2)	0.067	9.152	0.054	0.138	0.058	2.987
E/A(+3)	0.070	4.401	0.056	3.525	0.060	4.023
E/A(+4)	0.067	-4.152	0.058	3.870	0.061	1.328
E/A(+5)	0.067	-1.012	0.059	2.542	0.062	1.466
ΔA/A(-5)	0.081	21.800	0.096	61.102	0.092	49.809
ΔA/A(-4)	0.113	38.967	0.104	8.727	0.106	15.081
ΔA/A(-3)	0.107	-5.069	0.099	-5.356	0.101	-5.116
ΔA/A(-2)	0.087	-19.282	0.079	-19.686	0.081	-19.572
ΔA/A(-1)	0.049	-43.551	0.023	-70.466	0.030	-63.024
ΔA/A	0.024	-49.932	0.004	-81.695	0.010	-68.288
ΔA/A(+1)	0.038	57.243	0.009	119.446	0.017	80.377
ΔA/A(+2)	0.052	35.899	0.018	92.455	0.027	58.686
ΔA/A(+3)	0.065	23.683	0.040	119.233	0.046	70.200
ΔA/A(+4)	0.055	-15.598	0.042	5.602	0.045	-2.317
ΔA/A(+5)	0.049	-9.394	0.045	8.446	0.046	2.682

	Divomission with EPSG(1-5)					
	63-78		**79-00**		**63-00**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.083		0.108		0.104	
E/A(-4)	0.060	-27.953	0.097	-10.595	0.090	-13.237
E/A(-3)	0.068	14.311	0.074	-23.336	0.073	-18.579
E/A(-2)	0.049	-27.430	0.043	-42.211	0.044	-39.589
E/A(-1)	0.025	-49.729	0.036	-182.972	0.024	-154.579
E/A	0.041	63.133	0.009	-76.007	0.001	-103.317
E/A(+1)	0.041	1.157	0.001	-85.182	0.008	915.912
E/A(+2)	0.083	103.312	0.006	377.994	0.018	118.911
E/A(+3)	0.032	-61.143	0.018	-391.580	0.022	22.918
E/A(+4)	0.056	73.115	0.022	24.939	0.033	52.737
E/A(+5)	0.060	7.232	0.056	152.317	0.057	71.523
ΔA/A(-5)	0.274	356.186	0.110	96.685	0.141	145.910
ΔA/A(-4)	0.258	-6.167	0.091	-16.725	0.123	-12.809
ΔA/A(-3)	0.039	-115.193	0.113	23.668	0.084	-31.760
ΔA/A(-2)	0.182	365.026	0.103	-8.834	0.049	-42.058
ΔA/A(-1)	0.035	-119.464	0.021	-120.522	0.010	-121.277
ΔA/A	0.020	-43.851	0.073	248.070	0.056	438.538
ΔA/A(+1)	0.041	103.897	0.047	-36.238	0.027	-50.753
ΔA/A(+2)	0.062	52.404	0.000	-100.807	0.015	-154.079
ΔA/A(+3)	0.005	-107.707	0.008	-2248.662	0.007	-150.256
ΔA/A(+4)	0.029	-709.747	0.051	524.806	0.034	355.754
ΔA/A(+5)	0.021	-26.529	0.129	154.764	0.099	192.063

	Divdecrease with EPSG(1-5)					
	63-78		**79-00**		**63-00**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.094		0.119		0.113	
E/A(-4)	0.083	-11.625	0.107	-10.133	0.102	-10.401
E/A(-3)	0.086	3.570	0.083	-22.458	0.083	-17.846
E/A(-2)	0.075	-13.069	0.054	-34.995	0.058	-30.097
E/A(-1)	0.032	-57.162	0.004	-106.597	0.004	-92.863
E/A	0.059	82.356	0.008	-327.414	0.019	355.912
E/A(+1)	0.065	11.326	0.032	298.561	0.040	112.187
E/A(+2)	0.084	28.686	0.023	-29.969	0.038	-5.369
E/A(+3)	0.062	-25.616	0.039	73.522	0.045	18.882
E/A(+4)	0.075	19.974	0.037	-6.324	0.048	5.117
E/A(+5)	0.079	5.804	0.005	-86.327	0.026	-44.983
ΔA/A(-5)	0.145	83.443	0.134	2571.358	0.136	419.612
ΔA/A(-4)	0.132	-9.282	0.108	-19.438	0.113	-17.095
ΔA/A(-3)	0.031	-76.332	0.084	-21.523	0.073	-35.361
ΔA/A(-2)	0.009	-72.144	0.058	-31.252	0.047	-35.032
ΔA/A(-1)	0.024	170.986	0.028	-148.318	0.017	-135.662
ΔA/A	0.058	144.213	0.053	90.519	0.029	74.346
ΔA/A(+1)	0.045	-21.145	0.048	-10.716	0.025	-15.772
ΔA/A(+2)	0.076	67.460	0.001	-98.298	0.016	-165.948
ΔA/A(+3)	0.043	-43.632	0.025	-3222.642	0.029	78.977
ΔA/A(+4)	0.058	35.019	0.019	-173.779	0.001	-104.196
ΔA/A(+5)	0.057	-1.488	0.038	102.133	0.018	1325.611

	Divomission with EPSG(1,5)					
	63-78		**79-00**		**63-00**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.067		0.080		0.078	
E/A(-4)	0.068	2.462	0.076	-5.158	0.075	-4.032
E/A(-3)	0.065	-4.994	0.066	-14.005	0.066	-12.558
E/A(-2)	0.052	-19.221	0.047	-27.663	0.048	-26.192
E/A(-1)	0.000	-100.483	0.023	-147.480	0.019	-138.519
E/A	0.014	-5448.728	0.003	-88.088	0.000	-100.906
E/A(+1)	0.031	131.527	0.019	-790.211	0.021	12305.117
E/A(+2)	0.040	25.878	0.034	80.902	0.035	65.826
E/A(+3)	0.046	17.556	0.028	-16.910	0.032	-8.461
E/A(+4)	0.044	-4.343	0.037	33.940	0.039	22.343
E/A(+5)	0.047	6.070	0.042	13.213	0.043	11.506
ΔA/A(-5)	0.086	82.866	0.090	113.336	0.089	106.391
ΔA/A(-4)	0.118	36.951	0.083	-7.736	0.089	-0.215
ΔA/A(-3)	0.098	-17.140	0.088	5.395	0.089	0.208
ΔA/A(-2)	0.079	-19.751	0.050	-42.644	0.055	-38.246
ΔA/A(-1)	0.006	-91.969	0.074	-247.761	0.060	-208.858
ΔA/A	0.093	-1571.992	0.102	37.175	0.100	66.818
ΔA/A(+1)	0.067	-27.789	0.070	-31.567	0.069	-30.980
ΔA/A(+2)	0.002	-102.548	0.030	-56.465	0.024	-64.723
ΔA/A(+3)	0.068	3891.703	0.017	-155.913	0.026	-208.412
ΔA/A(+4)	0.007	-109.889	0.026	51.230	0.020	-25.326
ΔA/A(+5)	0.014	-313.773	0.030	17.593	0.027	38.543

	Divdecrease with EPSG(1,5)					
	63-78		**79-00**		**63-00**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.085		0.094		0.092	
E/A(-4)	0.083	-2.098	0.090	-4.609	0.088	-4.128
E/A(-3)	0.081	-2.374	0.083	-6.900	0.083	-6.009
E/A(-2)	0.074	-8.889	0.073	-12.580	0.073	-11.824
E/A(-1)	0.050	-31.954	0.039	-46.768	0.041	-43.636
E/A	0.049	-2.334	0.041	4.351	0.042	2.644
E/A(+1)	0.062	27.220	0.052	28.885	0.054	28.668
E/A(+2)	0.069	11.136	0.053	2.437	0.057	4.861
E/A(+3)	0.073	5.080	0.054	1.219	0.059	2.591
E/A(+4)	0.071	-2.182	0.056	3.515	0.060	2.016
E/A(+5)	0.070	-1.405	0.058	3.499	0.061	2.174
ΔA/A(-5)	0.092	30.821	0.098	68.837	0.097	58.415
ΔA/A(-4)	0.102	11.408	0.089	-9.507	0.091	-5.352
ΔA/A(-3)	0.096	-5.914	0.087	-2.338	0.089	-3.172
ΔA/A(-2)	0.083	-14.101	0.069	-20.379	0.072	-18.948
ΔA/A(-1)	0.042	-49.148	0.015	-78.918	0.020	-71.729
ΔA/A	0.015	-63.196	0.003	-123.720	0.001	-97.431
ΔA/A(+1)	0.029	90.139	0.004	-224.452	0.010	1770.734
ΔA/A(+2)	0.059	99.429	0.011	158.208	0.021	120.257
ΔA/A(+3)	0.070	20.144	0.035	215.372	0.043	98.645
ΔA/A(+4)	0.055	-22.131	0.041	17.740	0.044	3.287
ΔA/A(+5)	0.057	4.535	0.044	7.187	0.047	6.424

There are two main conclusions which can be made from Table 3.10: (1) if firms with decreasing past EPS chose to omit/decrease dividends, they may not be going to have decreases in future EPS; (2) if firms with decreasing past EPS chose to omit/decrease dividends, it is not certain that they are extending their size by re-investing their cash in themselves. For firms who omit/decrease dividends, they usually have generally increasing future E/A, although decreasing E/A at a certain year can be observed occasionally. The growing future E/A for firms who experience decreasing EPS and omit/decrease dividends is significant. For some groups of firms with EPSD, they even have YoY increased in future EPS. On the other hand, we cannot find significant and robust increases in future asset growth for these firms.

3.5.5. Robustness tests

3.5.5.1. Dividend initiators who did not pay dividend over past three or five years

Since our dummies record firms' earnings growth for the past three years or five years which are longer than the dependent variables of dividend status, we also create alternative dependent variables (*S3newpayer* and *S5newpayer*) which record firms' payout status for the past three years or five years in our regression models as alternative dependent variables for the purpose of a robustness check.

We create "strong" dependent variables which represent firms' payout status at current fiscal year t, when firms' payout statuses are also considered for the past three years and five years. Because these two "strong" dependent variables (*S3newpayer* and *S5newpayer*) record firms' past dividend status for the past three years and five years, we apply it in Baker and Wurgler (2004a)'s method of running regressions which use dependent variables with the condition of past payout status.

We only report results of running similar regression on *S3newpayer* by other explanatory variables in Table 3.11 and results of regression on *S5newpayer* by other independent variables in Table 3.12 from 1963 to 2000 by using the FTP format of COMPUSTAT data set. For Table 3.11 and Table 3.12, we have the first step where we rule out the impact of conventional factors, and the second step (Panel A, Panel B, Panel C, and Panel D) which test the effect of dividend premium and past earnings performance on propensity to be "strong" new payers (*PTSI*) or changes in propensity to be "strong" new payers (Δ*PTSI*).

Table 3.11 Decision of being strong new dividend payers (S3newpayer) and determining factors from 1963 to 2000

Table 3.11 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to "strong" initiate (*PTS3I*). At second step we use pooled method to regression *PTS3I* on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)* and *EPSG(1,3)*). The second stage is divided into Panels B, Panel C, Panel D, and Panel E which respectively report *PTS3I* without controlling risks, *PTS3I* after controlling for risks, Δ*PTS3I* without controlling for risks, and Δ*PTS3I* after controlling for risks on $VW\ P^{D-ND}$ and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

			Panel A. Dependent variable: S3newpayer			
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***
-4.11***(-14.02)	1.86***(5.01)	0.02(0.07)	-0.94***(-6.22)	6.46***(5.40)		
-7.24*(-1.75)	3.49(1.21)	-0.05(-0.17)	-3.53(-1.40)	16.26*(1.72)	245.35 (1.22)	61.68 (0.66)
			Panel B. PTS3I without controlling risk factors			
Intercept	$VW\ P^{D-ND}$	***EPSG (1-3)***	***EPSG(1,3)***	***N***	R^2	
0.04***(14.84)	0.16***(17.74)	0.02***(5.80)		28150	0.02	
0.03***(9.80)	0.12***(15.06)		0.02***(10.95)	30095	0.02	
			Panel C. PTS3I after controlling risk factors			
0.02***(6.59)	0.15***(14.32)	0.02***(5.51)		27322	0.02	
0.01***(3.24)	0.15***(14.88)		0.03***(9.85)	28220	0.02	
			Panel D. ΔPTS3I without controlling risk factors			
0.05***(16.92)	0.16***(18.12)	0.03***(8.18)		26896	0.02	
0.04***(11.56)	0.16***(18.51)		0.03***(13.79)	27746	0.02	
			Panel E. ΔPTS3I after controlling risk factors			
0.05***(14.94)	0.23***(21.41)	0.03***(8.14)		26099	0.03	
0.04***(9.49)	0.23***(21.93)		0.04***(13.86)	26896	0.03	

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

In Table 3.11, when *S3newpayer* performances is the dependent variable in the Fama-Macbeth logistic regression, we cannot find significant differences from the new regression's results to the results in Table 3.3, if risk factors are not considered. Firms' size and profitability show a positive effect on firms' decisions of being new dividend payers, while *M/B* ratio is significantly negatively related to the dividend-issuing decision, but asset growth does not have a significant relation with the status of being "strong" dividend payers. When risks are added, only profitability's significance is left, which may indicate a bad model-fitting. It means that risks cannot explain "strong" initiation after being non-payers for three years.

From Table 3.11, we can also find that firms' past positive earnings growth plays a significant role in positively affecting managers' decision of paying dividends, after firms choose to be non-payers for years. The same to results found in Table 3.3, investors' requirement in receiving dividends (dividend premium) also play a significant role. Results in Table 3.11 and Table 3.12 imply that managers will also take investors' sentiments into consideration, when managers are making different payout decisions, after they refuse to pay dividends for three years or five years.

Table 3.12 Decision of being strong new dividend payers (S5newpayer) and determining factors from 1963 to 2000

Table 3.12 reports the two-step regression of firms'' dividend decisions on conventional factors, dividend premium and optimistic past earning performance. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to "strong" initiate (*PTS5I*). At second step we use pooled method to regression $PTS5I$ on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-5)* and *EPSG(1,5)*). The second stage is divided into Panels B, Panel C, Panel D, and Panel E which respectively report *PTS5I* without controlling risks, *PTS5I* after controlling for risks, Δ*PTS5I* without controlling for risks, and Δ*PTS5I* after controlling for risks on *VW* P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: S5newpayer						
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***
-4.72***(-13.89)	2.07***(4.63)	-0.02(-0.06)	-1.02***(-5.64)	5.45***(5.27)		
-2.91***(-3.02)	0.86(0.64)	1.26(0.73)	-2.18*(-1.91)	9.99*(1.80)	180.82(1.50)	-140.37(-1.32)
Panel B. PTS5I without controlling risk factors						
Intercept	$VW\ P^{D-ND}$	***EPSG (1-5)***	***EPSG(1,5)***	N	R^2	
0.06***(15.19)	0.17***(15.42)	0.02**(2.44)		19709	0.02	
0.04***(10.59)	0.12***(12.84)		0.03***(9.20)	22254	0.02	
Panel C. PTS5I after controlling risk factors						
0.06***(16.39)	0.17***(15.26)	0.02***(2.61)		19131	0.02	
0.05***(12.91)	0.18***(16.12)		0.03***(9.19)	20634	0.02	
Panel D. ΔPTS5I without controlling risk factors						
0.06***(15.26)	0.17***(15.29)	0.03***(3.28)		18687	0.02	
0.04***(10.69)	0.17***(16.28)		0.03***(10.82)	20125	0.02	
Panel E. ΔPTS5I after controlling risk factors						
0.06***(15.25)	0.17***(14.97)	0.03***(3.47)		18133	0.02	
0.04***(10.59)	0.17***(15.95)		0.03***(10.90)	19511	0.02	

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

When *S3newpayer* is replaced by *S5newpayer* in Table 3.12, we find the same conclusion made from Table 3.11. Our proxies of managers' extrapolation based on positive past earnings performance survive through all models and methods. The conclusions we can make from the EPS-related dummy variables are the same and robust.

3.5.5.2. Sub-sample periods: 1963-1978 and 1979-2000

Butler et al. (2006a) suggest a structure break around 1978, and Hoberg and Prabhala (2009) apply this structure break in testing their risk factors on Baker's and Wurgler's (2004a) *PTI* and Δ*PTI* by running regressions separately in different time horizons. For the purpose of robustness check, we also examine managers' extrapolations on Δ*PTP* and Δ*PTP* (Hoberg and Prabhala, 2009) and *PTI* (Baker and Wurgler, 2004a) in different time horizons: 1963-1978 and 1979-2000 respectively.

Table 3.13 Decision of being dividend payers and determining factors from 1963 to 1978

Table 3.13 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 1978. At Panel A we perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to pay (*PTP*). At second stage we use pooled method to regression ΔPTP on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second stage is divided into Panels B and Panel C which respectively report ΔPTP without controlling risk factors *on VW* P^{D-ND} and firms' optimistic past EPS performance, and ΔPTP after controlling risk factors on *VW* P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth ($\Delta A/A$) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: Payer							
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-0.06(-0.28)	3.88***(14.45)	-0.79(-1.72)	-0.82***(6.04)	18.14***(6.68)			
2.89***(4.20)	3.16***(6.16)	-1.03**(-2.57)	-0.48***(3.22)	14.95***(5.49)	-142.46***(-8.78)	-76.54***(-7.13)	
Step 2: Firm-year PTP as dependent variable; Pooled method by controlling industry dummy							
Panel B. ΔPTP without controlling for risk factors							
Intercept	***VW P^{D-ND}***	***EPSG(1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	***R^2***
2.53E-3 (0.32)	0.04*(1.72)	0.02**(2.41)				10440	0.00
-0.04***(-4.65)	0.07***(3.48)		0.06***(12.79)			11635	0.01
-0.01(-1.22)	0.03*(1.80)			0.04***(8.62)		15545	0.00
-0.04***(-7.02)	0.04**(2.19)				0.07***(18.27)	16211	0.02
Panel C. ΔPTP after controlling for risk factors							
0.01(1.62)	-0.04(-1.51)	4.62E-3 (0.45)				10257	0.00
-0.01(-1.46)	-0.02(-1.07)		0.04***(8.31)			11439	0.01
0.02**(2.40)	-0.07***(-3.59)			0.03***(5.90)		15224	0.00
-0.02**(-2.24)	-0.07***(-3.99)				0.06***(14.33)	15873	0.01

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

Table 3.14 Decision of being new dividend payers and determining factors from 1963 to 1978

Table 3.14 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 1978. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to initiate (*PTI*). At second step we use pooled method to regression PTI and ΔPTI on Baker and Wurgler (2004a)'s dividend premium (*VW* P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B, Panel C, Panel D and Panel E which respectively report *PTI* without controlling for risks, Δ*PTI* without controlling for risks, *PTI* after controlling for risks, and ΔPTI after controlling for risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A: Dependent variable: Newpayer							
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-2.18***(-4.49)	1.37**(2.92)	0.60(1.22)	-1.52**(-2.81)	15.00***(5.12)			
-0.18(-0.39)	0.65(1.12)	0.88(1.69)	-1.53***(-3.04)	13.87***(4.69)	-17.48(-0.56)	-57.62***(-4.97)	
Panel B. PTI without controlling for risk factors							
Intercept	***VW*** P^{D-ND}	***EPSG(1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	R^2
0.02(0.86)	0.04(0.44)	-0.00(-0.11)				2223	0.00
0.02(1.4)	-0.13***(-3.21)		0.04***(3.58)			2683	0.01
0.02(1.01)	0.01(0.11)			0.03**(2.30)		3741	0.00
0.01(0.85)	-0.12***(-3.35)				0.05***(4.71)	4157	0.01
Panel C. PTI after controlling for risk factors							
0.04*(1.93)	0.11(1.37)	-0.01(-0.22)				2187	0.00
4.51E-3 (0.21)	0.18**(2.45)		0.06***(4.63)			2379	0.01
0.02(1.61)	0.10*(1.81)			0.04***(2.68)		3655	0.00
-3.35E-3 (-0.22)	0.12**(2.38)				0.06***(5.58)	3776	0.01

Table 3.14(continue)

Intercept	*VW* P^{D-ND}	*EPSG(1-5)*	*EPSG(1,5)*	*EPSG(1-3)*	*EPSG(1,3)*	*N*	R^2
Panel D. ∆PTI without controlling for risk factors							
0.12***(4.89)	-0.03(-0.34)	0.08**(2.11)				2028	0.00
0.04*(1.94)	0.11(1.36)		0.10***(7.15)			2203	0.02
0.09***(5.69)	0.01(0.20)			0.09***(6.08)		3429	0.01
0.03**(2.00)	0.06(1.08)				0.11***(9.70)	3532	0.03
Panel E. ∆PTI after controlling for risk factors							
0.11***(4.79)	0.02(0.25)	0.06*(1.72)				1993	0.00
0.05**(2.09)	0.14*(1.83)		0.09***(6.53)			2165	0.02
0.09***(5.76)	0.04(0.60)			0.08***(5.64)		3349	0.01
0.04**(2.19)	0.09(1.52)				0.10***(9.30)	3448	0.02

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

Table 3.15 Decision of being dividend payers and determining factors from 1979 to 2000

Table 3.15 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1979 to 2000. At Panel A we perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to pay (*PTP*). At second stage we use pooled method to regression ΔPTP on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second stage is divided into Panels B and Panel C which respectively report ΔPTP without controlling risk factors *on VW* P^{D-ND} and firms' optimistic past EPS performance, and ΔPTP after controlling risk factors on *VW* P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth ($\Delta A/A$) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: Payer

Intercept	***NYP***	***$\Delta A/A$***	***M/B***	***E/A***	***Sys risk***	***Idi risk***
-0.83***(-4.11)	4.60***(30.40)	-0.45***(-4.45)	-0.75***(-10.57)	6.55***(21.47)		
1.61***(8.10)	4.06***(16.59)	-0.92***(-8.19)	-0.46***(-8.01)	5.06***(14.04)	-130.45***(-10.19)	-61.61***(-15.97)

Panel B. ΔPTP without controlling for risk factors

Intercept	***VW P^{D-ND}***	***EPSG(1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	***R^2***
0.02***(4.72)	0.09***(6.54)	0.04***(6.04)				39592	0.00
-0.01***(-3.89)	0.09***(6.51)		0.06***(25.52)			41272	0.02
0.01***(3.47)	0.08***(6.84)			0.04***(13.05)		47913	0.00
-0.01***(-4.32)	0.08***(6.29)				0.06***(26.6)	48888	0.02
Panel C. ΔPTP after controlling for risk factors							
0.01*(1.92)	-7.59E-4 (-0.05)	0.03***(4.37)				38346	0.00
-0.02***(-3.85)	-1.77E-3 (-0.12)		0.05***(17.10)			39959	0.01
6.13E-4 (0.17)	-0.02(-1.18)			0.04***(10.55)		46421	0.00
-0.02***(-5.60)	-0.02(-1.50)				0.05***(20.50)	47339	0.01

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

Table 3.16 Decision of being new dividend payers and determining factors from 1979 to 2000

Table 3.16 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1979 to 2000. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to initiate (*PTI*). At second step we use pooled method to regression PTI and ΔPTI on Baker and Wurgler (2004a)'s dividend premium (*VW* P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B, Panel C, Panel D and Panel E which respectively report *PTI* without controlling for risks, ΔPTI without controlling for risks, *PTI* after controlling for risks, and ΔPTI after controlling for risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth ($\Delta A/A$) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1.

Panel A. Dependent variable: Newpayer							
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-3.56***(-17.63)	1.52***(9.23)	-0.19**(-2.14)	-0.52***(-4.17)	5.97***(10.18)			
-2.44***(-11.02)	1.34***(5.93)	-0.50***(-4.51)	-0.44***(-3.69)	6.27***(9.52)	-58.60***(-4.13)	-24.71***(-6.18)	
Panel B. PTI without controlling for risk factors							
Intercept	***VW P^{D-ND}***	***EPSG(1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	***R^2***
0.01***(3.76)	0.03**(1.96)	0.01(1.40)				17486	0.01
0.01(1.42)	0.03**(2.21)		0.01***(5.89)			19571	0.01
0.01***(3.27)	0.02**(2.08)			0.01***(2.75)		24409	0.00
1.93E-3 (0.64)	0.02**(2.22)				0.01***(7.04)	25938	0.01
Panel C. PTI after controlling for risk factors							
0.01***(3.57)	0.01(0.83)	0.01(1.11)				16944	0.00
0.01*(1.85)	0.01(0.96)		0.01***(5.41)			18255	0.01
0.01***(3.08)	0.01(0.91)			0.01**(2.31)		23667	0.00
3.20E-3 (1.01)	0.01(0.85)				0.01***(6.36)	24444	0.00

Table 3.16 (continue)

Intercept	***VW*** P^{D-ND}	***EPSG(1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	R^2
Panel D. ΔPTI without controlling for risk factors							
0.03***(8.74)	0.02(1.39)	0.02***(2.83)				16219	0.01
0.02***(5.03)	0.02(1.49)		0.02***(9.52)			17456	0.01
0.03***(9.23)	0.02(1.57)			0.02***(5.25)		22850	0.01
0.02***(5.34)	0.02(1.55)				0.02***(11.05)	23579	0.01
Panel E. ΔPTI after controlling for risk factors							
0.03***(8.41)	3.12E-3 (0.23)	0.02***(2.91)				15704	0.01
0.02***(4.75)	3.88E-3 (0.30)		0.02***(9.19)			16885	0.01
0.03***(8.68)	1.71E-3 (0.16)			0.02***(5.25)		22136	0.01
0.02***(4.89)	1.15E-3 (0.11)				0.02***(10.65)	22817	0.01

*where *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.*

Similar to Table 3.6 and Table 3.3, we design Table 3.13 and Table 3.14, and Table 3.15 and Table 3.16 by using the same regression models but different time horizons. Again, we find that conventional determinants of dividend policy are mostly robust across different models and different time periods, except for size, asset growth, and systematic risk in Table 3.14. The significant impact from dividend premium on ΔPTP, *PTI,* or ΔPTI is not robust when risk factors are controlled for, and it supports Hoberg and Prabhala (2009)'s findings. Except for *EPSG(1-5)* under some cases with limited number of observations, indicators of managerial extrapolation proxy by earnings growth for the past three years or five years are robust regardless of whether risk factors are controlled for, and when investors' sentiment proxy by dividend premium is controlled for.

3.6. Conclusion

In this chapter we test the hypothesis that a firm's dividend payout decision is affected by its past long-term earnings performance. In the sample of U.S. firms from 1963 to 2000 the proportion of payers among those firms with past EPS's growth is higher than the proportion of dividend payers in the whole sample. We find that firms' previous growth in EPS affects firms' decisions of initiating/continuing/increasing/paying dividends. That is, firms' excellent past EPS's performance raises managers' expectations of future EPS performance, and then increases managers' will of using dividends as the signal to attract investors. Additionally, we find that our dummies which represent past earnings growth are robust in affecting managers' decisions to initiate dividends after choosing not to pay dividends for several years. We find that the impact of managerial extrapolation on firms' dividend decisions is robust compared with the catering factor which is proxy by dividend premium (Baker and Wurgler, 2004).

Different from previous literature which directly tests the relation between firms' dividend decisions and firms' future earnings performance (e.g. Arnott and Asness, 2003; Gwilym et al., 2006; Zhou and Ruland, 2006), we look for information from payers and new payers who may be affected by past earnings performance in making dividend decisions. We find that those dividend payers and new dividend payers, or those firms who continue/increase dividends have experienced positive past earnings growth are suffering non-increasing future profitability. This finding indicates that managers who are affected by firms' previous profitability growth and decide to pay dividends have over-reacted in extrapolating firms' past earnings performance into the future.

Our main findings posit a newly developed hypothesis that managers tend to extrapolate firms' past earnings performance when they are making dividend decisions, and firms' past long-term earnings performance could bring managers optimism on firms' future stable and excellent earnings performance. We also provide evidence that dividend payers and new dividend payers' previously growing EPS cannot be used to predict the future earnings' growth. On the contrary, dividend payers' previously growing profitability usually indicates a decrease in future earnings. We use these evidences to support our argument that managers are over-optimistic in expecting future earnings performance, and then making dividend decisions for the purposes of signalling.

As a further finding, our proxy for managers' extrapolation can also affect firms' decisions of omitting or increasing dividends. Firms tend to omit dividends after experiencing decreasing earnings and tend to increase dividends after experiencing the earnings growth over the past three years or five years. Although the direction of extrapolation factors can be different when propensity or changes in propensity is used, the significant impact from extrapolation factors remains robust across different models and conditions. In summary, the influence of managerial extrapolation on dividend policy is significant and robust. .

CHAPTER 4 PROFITABILITY CHANGE PERSISTENCE, MANAGERIAL OVERREACTION, AND REAPPEARING DIVIDENDS

---- Evidence from 1963 to 2013

4.1. Introduction

Chapter 3 provided empirical evidence that managerial over-reaction can affect firms' dividend decisions during the period 1963 to 2000. In an out-of-sample test, this chapter documents the re-appearance of dividend payers' percentage from 23.52% (2002) to 38.35% (2012), while the percentage of firms with year-on-year (YoY) growing profitability over the past three years increases from 6.49% (2002) to 16.42% (2013). We find that indicators proxy for managerial over-extrapolation applied in Chapter 3 can explain not only the disappearance of dividends from 1978 recorded by Fama and French (2001) but also the re-appearance of dividends from 2002 in this chapter. Similar with results obtained from the sample period of 1963 to 2000, during the out-of-sample period from 2001 to 2013, managerial overextrapolation also has significant effect on firms' dividend decisions given firms' other characteristics including size, current profitability, investment opportunities, and catering factor (Baker and Wurgler, 2004a).

We test whether managers who observe firms' past growing/decreasing profitability and make dividend decisions based on this past stream of profits are over-optimistic/over-pessimistic in an out-of-sample time period from 2001 to 2013 as well as in the whole time period from 1963 to 2013. For the time period 1963 to 2013, we find that firms that decide to initiate/continue/increase/pay dividends based on past growing profitability tend to have negative growth rate of profitability in the future five years, while firms that decide to omit/decrease dividends based on past decreasing profitability tend to have positive growth rate of profitability in the future five years. During the out-of-sample period, this finding does not hold for the last two or three years of the future five years, but these profitability-growing/profitability-deducting firms' total growth rates of profitability from the current year to the end of the future five years are negative/positive. Therefore, we conclude that in a larger size of sample from 1963 to 2013 and in an out-of-sample period from 2001 to 2013, managers overreact in extrapolating past profitability performance into the future.

In a topic related to managers' dividend decisions, an out-of-sample test for robustness check is necessary because determinants' impact on firms' dividend decisions may change over time or change when the methodology used to analyse is changed. Take the catering theory (Baker and Wurgler, 2004a) as an example: since Fama and French (2001) record that firms' *propensity to pay* dividends (calculated as the residual of logistic regression by regressing the status of whether firms are dividend payers or not on determining factors) decreases after 1978, literature tentatively looks for factors which can be used to explain this phenomena of disappearing dividends. Given conventional factors like firms' size, current profitability, and investment opportunity, Baker and Wurgler (2004a) develop a catering theory that rational managers may cater to investors' demand on dividends, and Baker and Wurgler (2004b) find that the onset and continuation of disappearing dividends is driven by the catering factor (*dividend premium* which is the difference between log of value-weighted market to book ratio for dividend payers and log of value-weighted market to book ratio for non-payers) by dividing their sample time period from 1963 to 2000 into four trends based on movements of firms' propensity to pay dividends. Later studies about catering theory on dividend policy have mixed conclusions. Li and Lie (2006) extend the research by Baker and Wurgler (2004a) to include dividend increases and dividend decreases, and they find supportive evidence that *dividend premium* can also affect firms' decisions in changing dividends. However, Julio and Ikenberry (2004) claim that *dividend premium*'s explanatory power on dividend decisions becomes weaker when firms' size and age are controlled for in the sample from 1984 to 2003. Denis and Osoboy (2008) also claim in a counter-argument to catering theory that *dividend premium* is more fluctuating than firms' *propensity to pay* based on the sample from 1989 to 2002. Hoberg and Prabhala (2009) use the data from 1963 to 2004 and add risk factors into the logistic regression model used by Baker and Wurgler (2004a). They find that *dividend premium* only has significant positive impact on firms' *propensity to pay* when firms' risk factors are not considered. However, the catering theory survives from these counter-arguments. By using a different definition of dividend initiation, Bulan et al. (2007) construct a moral hazard model based on a sample from 1963 to 2001 to provide empirical evidence that dividend premium still plays an essential role in explaining firms' decisions of being dividend initiators. Jiang et al. (2013) extend the sample period to one from 1965 to 2010 and find that *dividend premium* is significantly positively related to firms' decisions of paying dividends in the multinomial logistic regression model.

The debate on whether catering theory can affect firms' decisions of paying dividends encourages another interesting research question: are determinants of dividend decisions different under different definitions of variables or during different time periods? Previous empirical research focuses on firms' payout policy and uses samples from the U.S market; COMPUSTAT of the Wharton Research Data Services (WRDS) is widely used by these research. Using an up-to-date version of the COMPUSTAT data, we extend the sample period to 2013, then 2001-2013 becomes the out-of-sample period compared with previous literature related to dividend decisions. We test the robustness of managerial extrapolation's effect on dividend during different time periods. In detail, we continue to use a similar methodology as that used in Chapter 3 to analyse determinants of dividend policy, and we examine whether managerial extrapolation can significantly explain firms' dividend decisions in the out-of-sample period as well as in the period from 1963 to 2013.

As a robustness test of our indicators of managerial overextrapolation, we also construct dummies representing firms' past EPS's growth by using alternative definition. We exclude observations with negative EPS during the past three years for EPSG(1-3), EPSG(1,3), EPSD(1-3), EPSD(1,3) or five years for EPSG(1-5) and EPSG(1,5). Firms' EPS' changes from one direction to its opposite direction (e.g. from positive to negative) may convert much more information than EPS's changes from one direction to the same direction (e.g. from positive to positive). Especially for the EPS's changes from positive to negative for firms who already pay dividends, these firms may loss the available source to pay dividends and decrease/omit dividends immediately, even though managers are not extrapolating past declining EPS into the future. Excluding negative EPS from our sample' observation is necessary in checking the robustness of previous empirical findings.

Another arising issue related with firms' dividend policy is that the recent financial crisis may have significant impact on firms' strategy of paying dividends. As in Floyd et al. (2015), firms can take the advantage of the 2007-2008 financial crisis, and use dividends as the signal of strong future performance to convince investors. On the other hand, managers many perceive depressive earnings performance in the future during the financial crisis, which drives them to decrease/omit dividends. We also jointly test recessions or crisis with our managerial overextrapolation and dividend premium in same regressions as further robustness check for our indicators of managerial overextrapolation.

Chapter 4 is more than a complement of Chapter 3 and Chapter 4 has its unique empirical contribution to this thesis, because it discusses the issue of re-appearing dividends as well as the recent financial crisis on firms' dividend policy. Chapter 4 also independently discusses whether the re-appearance of dividends are driven or at least partly affected by our indicators of managerial overextrapolation.

This chapter is organised as follows: Section 4.2 introduces the data and variables used in regression models which are similar to those used in Chapter 3. All empirical results from the whole sample period from 1963 to 2013, and out-of-sample period from 2001 to 2013 will be compared and analysed in Section 4.3, and robustness test by using alternative dependent variables will be discussed in Section 4.3 as well. The last part of Section 4.3 will discuss whether managers who observed firms' past growing/decreasing profitability tend to become overextrapolated and make dividend decisions based on it. Section 4.4 shows and shortly discusses robustness test's results by using new indicators of managerial overextrapolation with non-negative EPS, and robustness test's results after controlling for recessions or financial crisis. Section 4.5 concludes..

4.2. Data and variables

Similarly as in Chapter 3, this chapter's sample covers all NYSE, AMEX, and NASDAQ firms in COMPUSTAT from fiscal year 1963 to 2013. The data of common stock returns and liquidity are from the Center for Research in Security Price (CRSP) database.

We use the same constructions of variables as used in Chapter 3: we include firms with fiscal year ends at t, and who have the following items: total assets (*AT*), stock price (*PRCC_F*) and shares outstanding (*CSHO*) at the end of the fiscal year, income before extraordinary items (*IB*), interest expense (*XINT*), [cash] dividends per share by ex-date (*DVPSX_F*), preferred dividends (*DVP*), and (a) preferred stock liquidating value (*PSTKL*), (b) preferred stock redemption value (*PSTKRV*), or (c) preferred stock carrying value (*PSTK*). Firms must also have (a) stockholders' equity (*SEQ*), (b) liabilities (*LT*), or (c) common equity (*CEQ*) and preferred stock par value (*PSTK*). Total assets must be available at fiscal years t and $t-1$. The other items must be available at t. We exclude firms with book equity below $250,000 or assets below $500,000. To ensure that firms are publicly traded, the COMPUSTAT sample includes only firms with CRSP share codes of 10 or 11, and we use only the fiscal years a firm is in the CRSP database at its fiscal year end. We exclude utilities firms (SIC codes 4900 to 4949) and financial firms (SIC codes 6000to 6999).

There are total 691031 firm-year observations in the original FTP format COMPUSTAT file from 1963 to 2013. After the selection criteria introduced above, there are 138127 satisfied firm-year observations left and go into the regression analysis. For the out-of-sample period, there are 34408 firm-year observations are analysed. Except our indicators of managerial overextrapolation, the summary statistics for other main variables used in regressions are present in Table 4.1 (change number of other tables). All definitions for these variables can be found at Appendix 3.1.

Table 4.1 Decision to be new dividend payers and determining factors from 1963 to 2013

Variable	N	Mean	Std Dev	Min	Max
Panel A. 1963-2013					
NYP	138127	0.28	0.30	0.00	1.00
E/A	138127	0.01	0.25	-20.86	2.85
M/B	138127	1.75	1.90	0.14	137.18
ΔA/A	121268	0.05	0.32	-33.99	0.99
sys risk	118242	0.03	0.02	0.00	0.74
idi risk	118242	0.01	0.01	0.00	0.08
Panel B. 2000-2013					
Variable	N	Mean	Std Dev	Min	Max
NYP	34408	0.28	0.30	0.00	1.00
E/A	34408	-0.03	0.33	-20.86	2.85
M/B	34408	1.92	1.62	0.14	47.06
ΔA/A	32557	0.00	0.56	-49.03	1.00
sys risk	30947	0.03	0.02	0.00	0.40
idi risk	30947	0.01	0.01	0.00	0.08

We mainly focus on analysing two groups of dividend decisions: being a dividend payer (*DVPSX_F*>0) and being a new dividend payer (*DVPSX_F*>0 at fiscal year *t*, and *DVPSX_F*=0 at fiscal year *t*-1)[14]. We also analyse firms who continue/increase/omit/ decrease dividends. We take into consideration the same dividend policy's determinants as used by Baker and Wurgler (2004a) and Hober and Prabhala (2009). Firm-year variables include stock exchange percentile (*NYP*) (Fama and French, 2001; Baker and Wurgler, 2004a) which represents a firm's size,

[14] Technically, current new dividend payers who must be non-payers at the last fiscal year is a sub-group of current dividend payers who can be payers, non-payers, or did not exist at the last fiscal year.

profitability (*E/A*) (Fama and French, 2001; Baker and Wurgler, 2004a), risk factors including idiosyncratic risk (*Idi risk*) and systematic risk (*Sys risk*) (Hoberg and Prabhala (2009), proxy for investment opportunities including market-to-book ratio (*M/B*) (Baker and Wurgler, 2004a), and asset growth (Δ*A/A*) (Fama and French, 2001; Baker and Wurgler, 2004a). We also control dividend premium which is the catering factor developed by Baker and Wurgler (2004a). Detailed descriptions for all the variables are in appendix 3.1.

We use the same indicators to represent firms' dividend-paying status as in Chapter 3, which includes firms' decisions to initiating dividends, increasing dividends, continuing dividends, paying dividends, omitting dividends, or decreasing dividends (see Appendix 3.2 for details). As the proxy for managerial extrapolation, we use the same indicators as in Chapter 3 to represent firms' status of experiencing previous earnings growth (see Appendix 3.3 for details).

We reformed our variables of EPSG and EPSD by using positive EPS only as robustness check, because the direction change in EPS may convert different information to the change in EPS without change in direction. We re-run the second-stage regressions for PTI, PTIN, ΔPTP, PTD and PTO (We do not show results based on PTC, because all coefficients for results of PTC are the same but opposite directions compared with results of PTO). We also test either (1) recession by using yearly NBER recession dummy as in Mclean and Zhao (2014), or (2) financial crisis dummy in our second-stage regressions as a further robustness check. The financial crisis dummy equals to 1 when there was the year of possible financial crisis that hit the U.S. market, otherwise it equals to 0. We define these years as years during the financial crisis: (1) 1973-1974 when oil prices soared, causing the

U.S. stock market crash; (2) 1989-1991 when there was the United States Saving and Loan crisis; (3) 2002-2003 when the early 2000 recession affect U.S. market; (4) 2007-2008 when recent financial crisis happened. In one regression function of the second-stage, we either use the recession dummy or the financial crisis dummy.

4.3. Results and analysis

4.3.1. Firms' previous growing/decreasing earnings and dividend decisions: direct evidence

Fama and French (2001) record a decline of dividend payers from 1978 to 1999, and then Julio and Ikenberry (2004) claim that dividend payers reappear after 2000 based on their sample between 1984 and 2004. Taking a general look at the relationship between payers and firms with past growth in EPS, we extend the sample period to cover more firm-year observations after 2001 until 2013. From Figure 4.1, which shows comparisons between annual percentages of firms who initiate/continue /increase/pay dividends and firms with YoY increases in EPS over the past three years, we can find that the recent re-appearance of firms who continue/increase/pay dividend began in 2002, and the reappearance of dividend initiators began in 2001. This empirical finding roughly supports Julio's and Ikenberry's (2004) finding. Besides, the percentage of firms who continue/increase/pay dividends sharply decreases from 1978, while dividend initiators' percentage declines from 1976, which is roughly consistent with Fama's and French's (2001) finding.

Figure 4.1's first figure (top left) exhibits the movement of dividend initiators' percentage and the percentage of firms with YoY increases in EPS over the past three years (*EPSG(1-3)*). The previous three-year data is used to form *EPSG(1-3)* and *EPSG(1,3)*, and the first five-year data is used for the construction of *EPSG(1-5)* and *EPSG(1,5)* as the pre-window, so we standardise the starting year in Figure 4.1 to Figure 4.3 as 1968[15]. Figure 4.1's first figure shows that dividend initiators' percentage arrives at a peak around 1976 followed by sharp decreases, and then reverts again at 2001 and achieves two sub-peaks separately around 2003 and 2012. The percentage of *EPSG(1-3)* and the percentage of dividend initiators show a similar degree of fluctuation within the sample period, and their co-movements are obvious. In other words, the positive relationship between initiating/continuing/increasing/paying dividends and firms' past earnings growth can be directly observed in the statistical data.

[15] Figure 4.1 only gives movements on percentage of dividend decisions and percentage of *EPSG(1-3)* as the example, but I find similar movement for percentage of *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)* to *EPSG(1-3).* Therefore, our finding and conclusion for Figure 4.1 can be applied to the investigation on movements between percentage of dividend decisions and percentage of *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*.

Figure 4.1 The relationship between the percentages of firms who initiate/continue/increase/pay dividends and the percentage of firms with YoY growing EPS over past three years.

In Figure 4.1 we plot, over time, the proportion of firms (to all firms) experiencing year-on-year earnings increases (*EPSG(1-3)*) over the past three years from 1968 to 2013, together with the proportion of firms (in dashed line) that initiate, increase, or pay dividends among all firms.

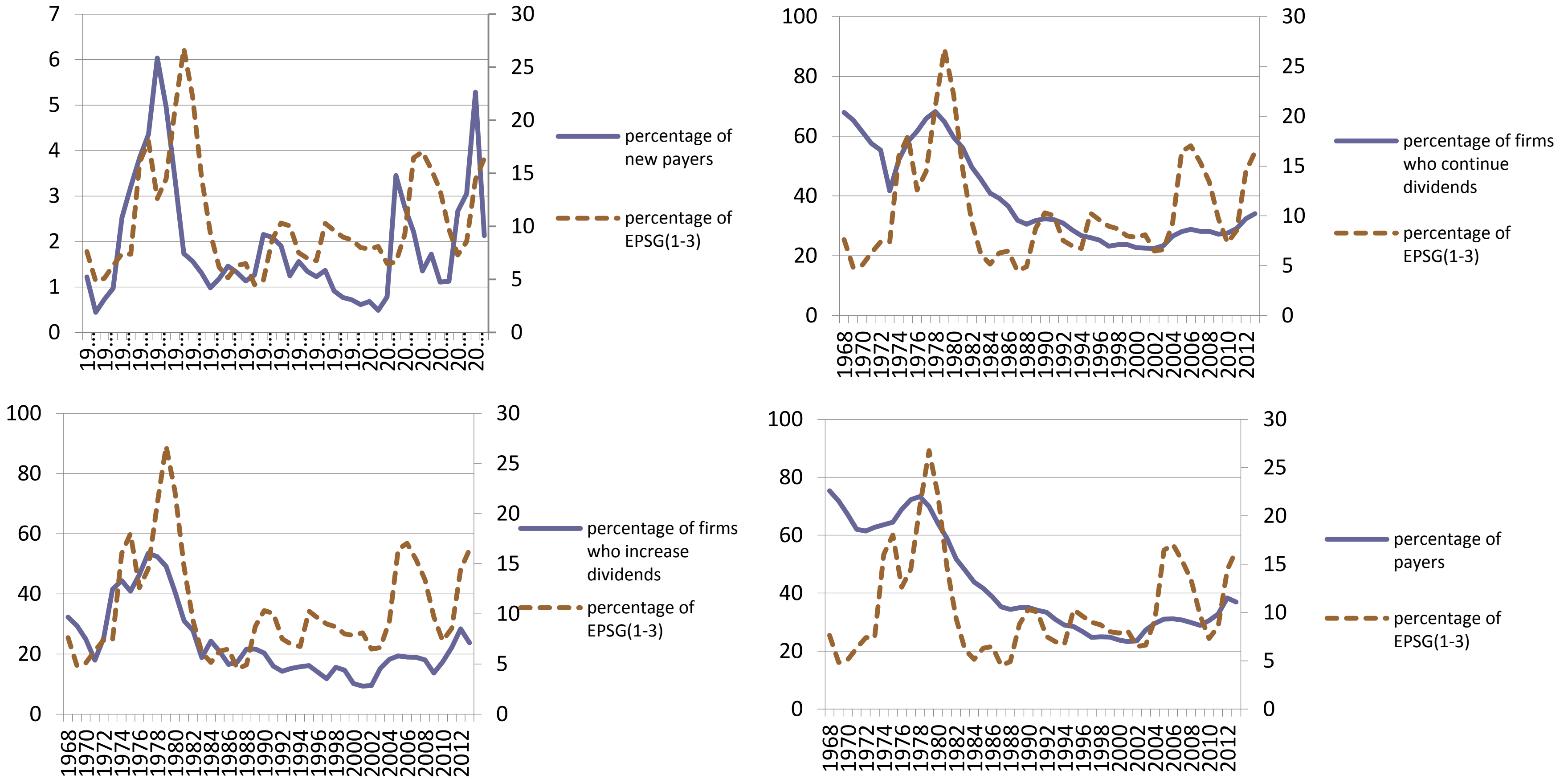


Figure 4.1's second figure (top right) to fourth figure (bottom right) exhibit movements in the percentage of *EPSG(1-3)* and movements in the percentages of firms who continue/increase/pay dividends. Similar to the first figure (top left) in Figure 4.1, the percentage of firms who continue/increase/pay dividends has thefirst peak at 1978, and also peaks around 2004 and 2012 after the "reappearance" time in 2002. Ignoring detailed fluctuations, the numbers and percentages of *EPSG(1-3)* show similar trends, although its volatility seems to be higher than the volatility for movement in percentage of firms who continue/increase/pay dividends.

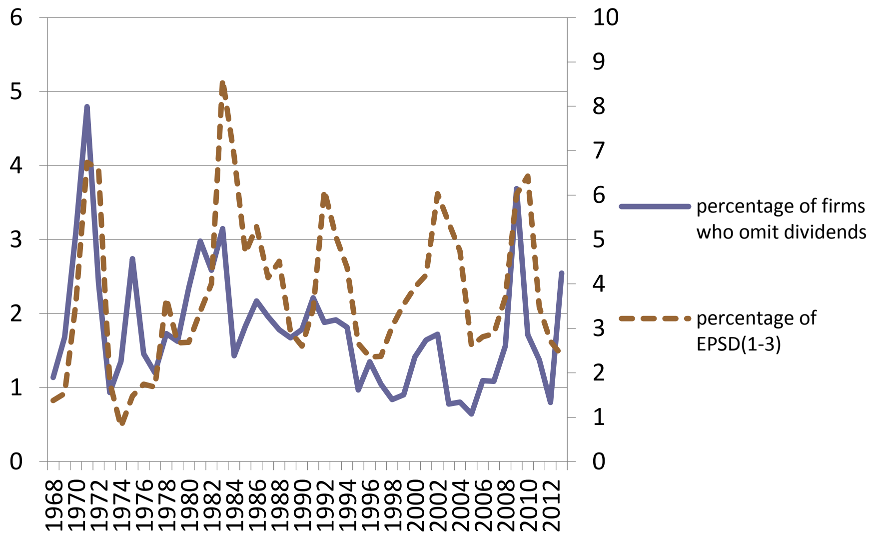
For a further analysis, from 1978, the drop in the percentage of firms with EPSG (1-3) is sharper than the drop in the percentage of firms who continue/increase/pay dividends. This weaker response of firms' decisions on continuing/increasing/paying dividends to previous profitability growth can be explained by the theory that dividends are "sticky" (Lintner, 1956; Guttman et al., 2010). After 2002, dividends reappear with fluctuations in 2005 and 2009, but firms with previous profitability growth reach a sub-peak in 2006 and move to a sub-bottom again in 2010. This lag for *EPSG(1-3)*'s percentage compared with the percentage of firms who continue/increase/pay dividends may indicate that earnings performance for a shorter period than 3-years also affects firms' dividend decisions. Figure 4.1 shows that dividend decisions can be affected by firms' earnings performance over the past 1-year, two-year, or 3-year periods. For example: (1) percentage of *EPSG(1-3)* and percentage of new dividend-payers achieve sub-peaks at 1995, which implies that dividend initiation is affected by *EPSG(1-3)*; (2) percentage of *EPSG(1-3)* has its sub-peak at 1990, while the percentage of dividend initiators reaches a sub-peak at 1989, which indicates the effects of the previous two-year earnings performance on decisions to initiate dividends[16]. From an extended sample from 1963 to 2013, these effects of varying the previous time period of earnings performance on dividend decisions can be observed in the previous literature's sample as well as in the out-of-sample period from 2001 to 2013. As has been discussed in Chapter 3, we use 3-years and 5-years respectively as representative time periods, because past earnings performance over these two time periods have a higher frequency to appear than during other time periods, and using 5-year period can avoid the survivorship bias (Lakonishok et al., 1994).

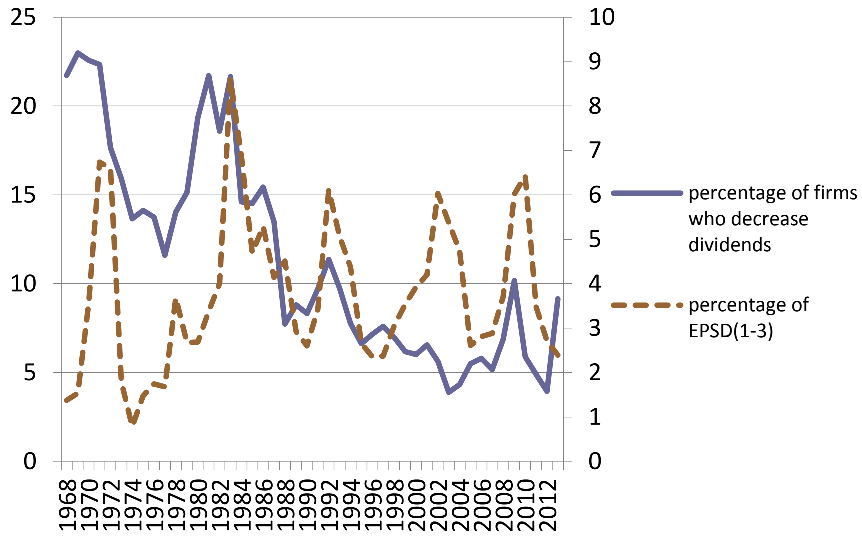
Figure 4.2's first figure (left) shows movements for the percentage of firms who omit dividends and the percentage of firms with past YoY decreasing profitability over the past three years (*EPSD(1-3)*), while Figure 4.2's second figure (right) shows movements for the percentage of firms who decrease dividends and the percentage of firms with past YoY decreasing profitability over the previous three years. The percentage of firms who omit/decrease dividends shares the same peaks with the percentage of *EPSD(1,3)* around 1971, 1983, 1992, 2002, and 2010. The correlation between firms' decisions to omit/decrease dividends and firms' past decreasing profitability is obvious.

[16] From figures which show movement on percentages of dividend decisions and percentage of firms with *EPSG(1-5)* or *EPSG(1,5)*, I find that firms' earnings performance over the past four-year or two-year periods can also affect firms' dividend decisions.

Figure 4.2 The relationship between the percentage of firms who omit/decrease dividends and the percentage of firms with YoY decreasing EPS over past three years.

. Figure 4.2 also shows the proportion of firms with YoY declines in EPS over the past three years (*EPSD(1-3)*), together with the proportion of firms that that choose to omit or decrease dividends among all firms from 1968 to 2013.





We also follow Chapter 3's method to draw Figure 4.3 to Figure 4.8 which show comparisons and trends between the percentage of firms that initiate/continue/increase/pay dividends after experiencing growth in EPS over the past three or five years and the percentage of firms that initiate/continue/increase/pay dividends among all firms, or between the percentage of firms that omit/decrease dividends after experiencing decline in EPS over the past three or five years and the percentage of firms that omit/decrease dividends among all firms during the whole time period of 1963-2013 which includes the out-of-sample period from 2001 to 2013. We use Figure 4.3 to Figure 4.8 to compare conditional (past growth in EPS) dividend decisions with unconditional dividend decisions.

In Figure 4.4, Figure 4.5, Figure 4.6, Figure 4.7 and Figure 4.8, during the out-of-sample period from 2001 to 2013, the percentage of fimrs that continue/increase/pay/omit dividendsafter experiencing past growth/decline in EPS remains at a higher level than the percentage of payers among all firms, and both of them move with similar trends. We find similar evidence in Figure 4.4 that the percentage of firms who initiate dividends after experiencing past growth in EPS is higher than the proportion of dividend-increasing payers among all firms, with only the exception of sub-figure with *EPSG(1-5).*

Figure 4.3 The percentage of firms that initiate dividends among all firms and the percentage of firms who initiate dividends among firms with earnings growths over the past three years or past five years

Figure 4.3 contains four sub-figures that respectively show time-series movements in the intersections of firms that initiate dividend and also experience past earnings growths over the past three years (*EPSG(1-3)*, *EPSG(1,3)*) and past five years (*EPSG(1-5)*, *EPSG(1,5)*), together with proportion of firms that initiate dividends among all firms.

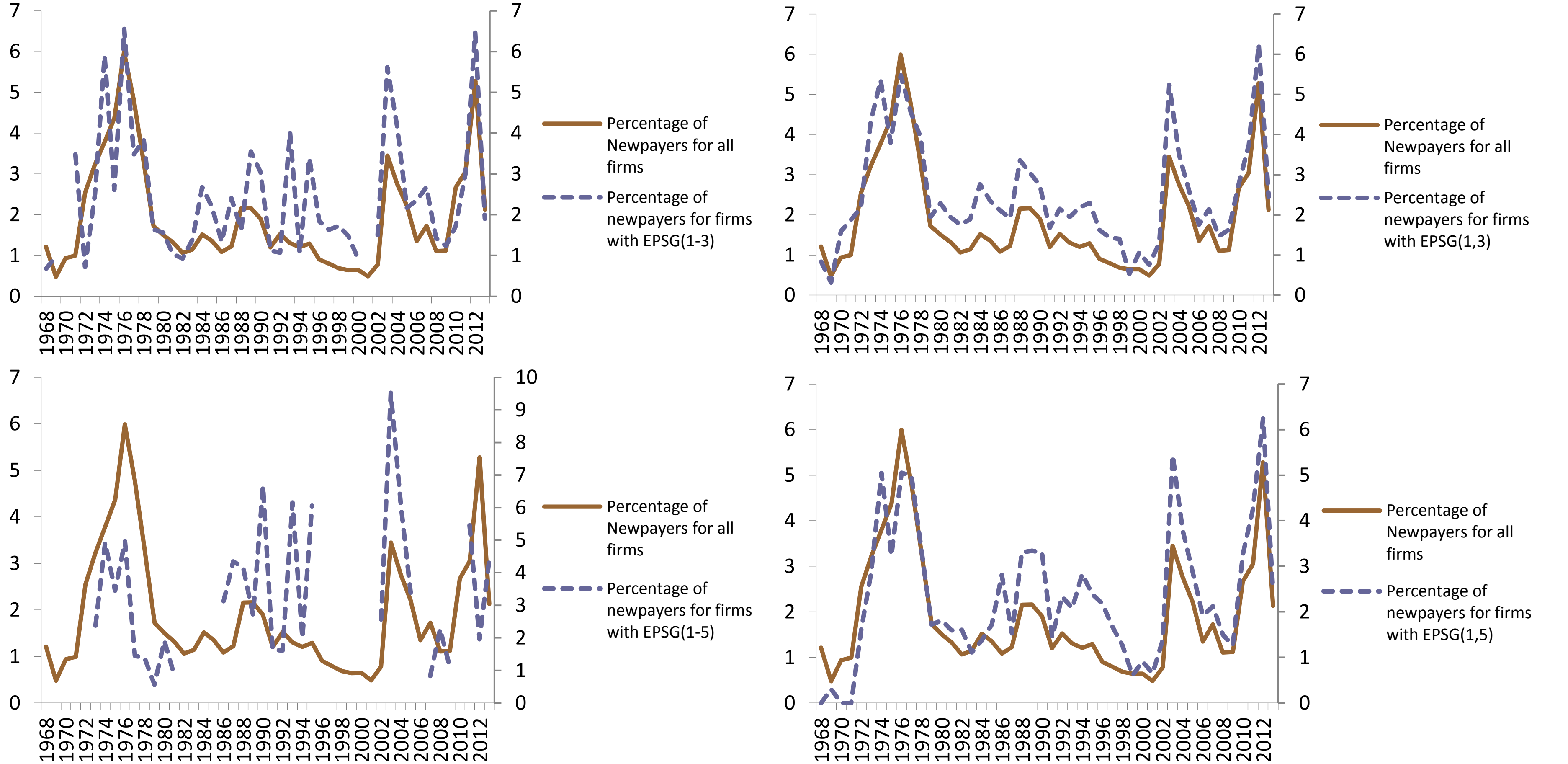


Figure 4.4 The percentage of firms that continue dividends among all firms and the percentage of firms who continue dividends among firms with earnings growths over the past three years or past five years

Figure 4.4 contains four sub-figures that respectively show time-series movements in the intersections of firms that continue dividend and also experience past earnings growths over the past three years (*EPSG(1-3)*, *EPSG(1,3)*) and past five years (*EPSG(1-5)*, *EPSG(1,5)*), together with proportion of firms that continue dividends among all firms.

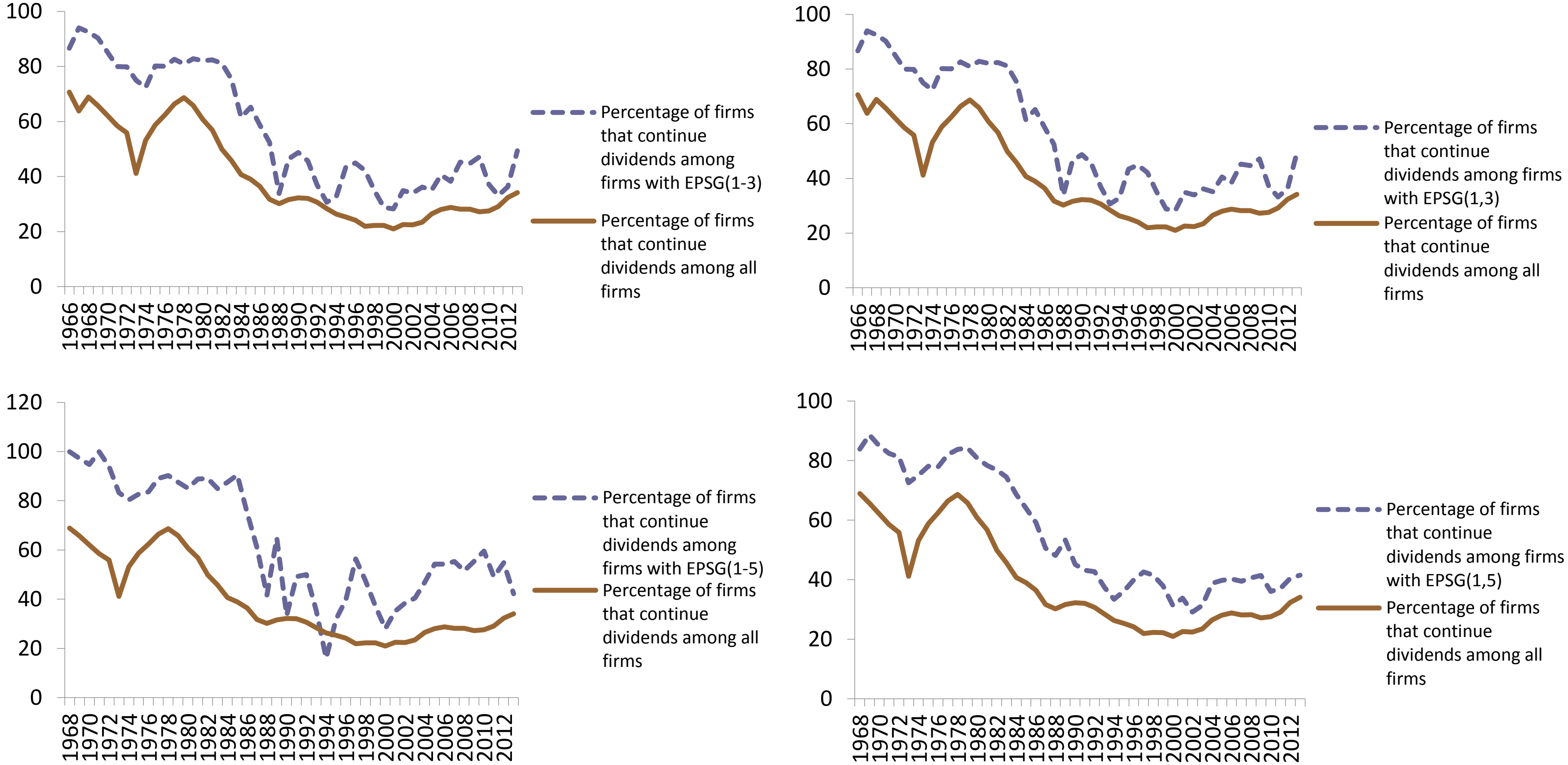


Figure 4.5 The relationship between the percentage of firms who increase dividends among all firms and the percentage of firms who increase dividends among firms with earnings growths over the past three years or past five years

Figure 4.5 contains four sub-figures that respectively show time-series movements in the intersections of firms that increase dividend and also experience past earnings growths over the past three years (*EPSG(1-3)*, *EPSG(1,3)*) and past five years (*EPSG(1-5)*, *EPSG(1,5)*), together with proportion of firms that increase dividends among all firms

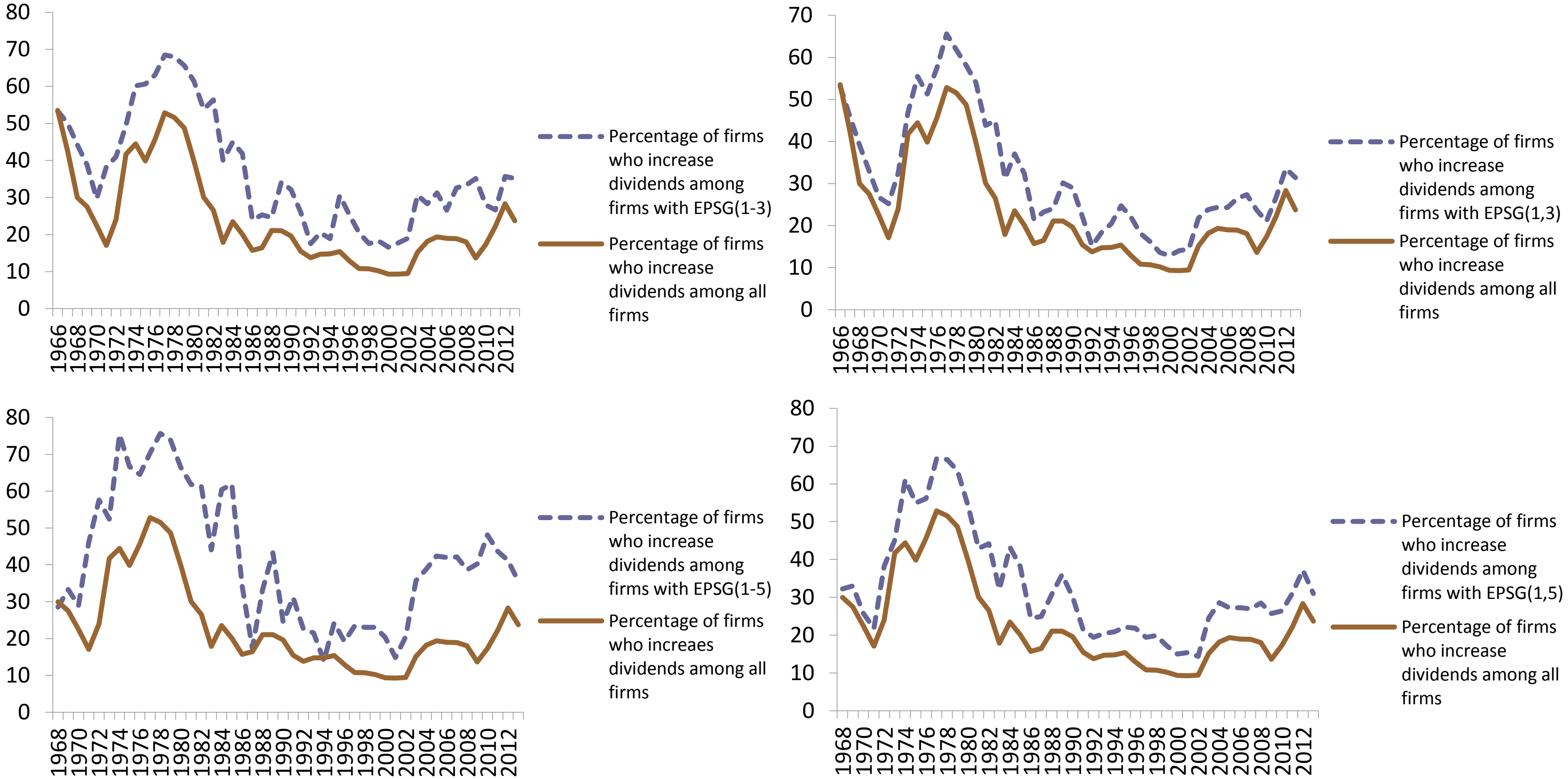


Figure 4.6 The relationship between the percentage of dividend payers among all firms and the percentage of dividend payers among firms with earnings growths over the past three years or past five years

Figure 4.6 contains four sub-figures that respectively show time-series movements in the intersections of dividend payers that also experience past earnings growths over the past three years (*EPSG(1-3)*, *EPSG(1,3)*) and past five years (*EPSG(1-5)*, *EPSG(1,5)*), together with proportion of dividend payers among all firms.

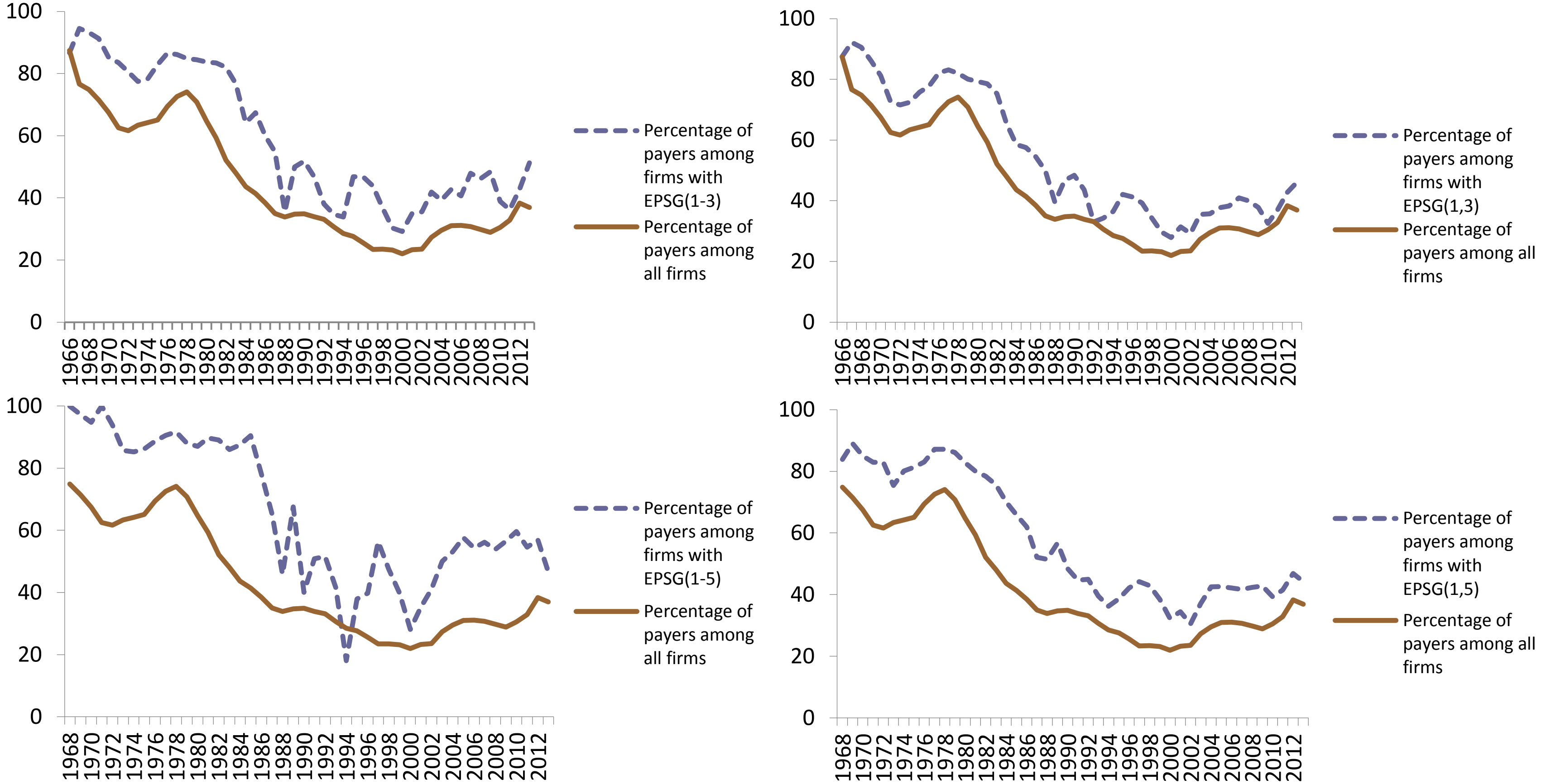


Figure 4.7 The percentage of firms that omit dividends among all firms and the percentage of firms that omit dividends among firms with earnings declines over the past three years or past five years

Figure 4.7 contains four sub-figures that respectively show time-series movements in the intersections of firms that omit dividend and also experience past earnings declines over the past three years (*EPSD(1-3)*, *EPSD(1,3)*) and past five years (*EPSD(1-5)*, *EPSD(1,5)*), together with proportion of firms that omit dividends among all firms.

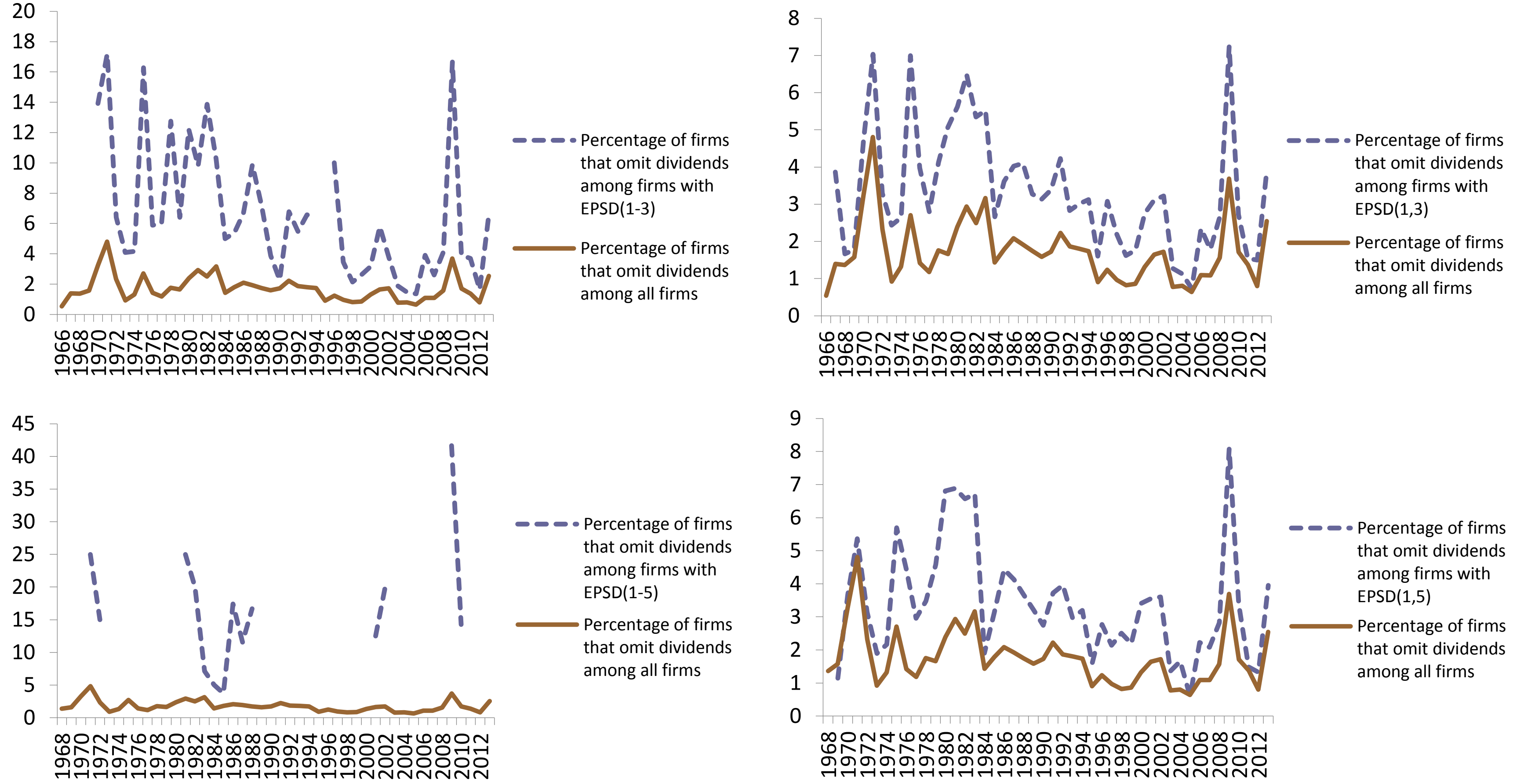
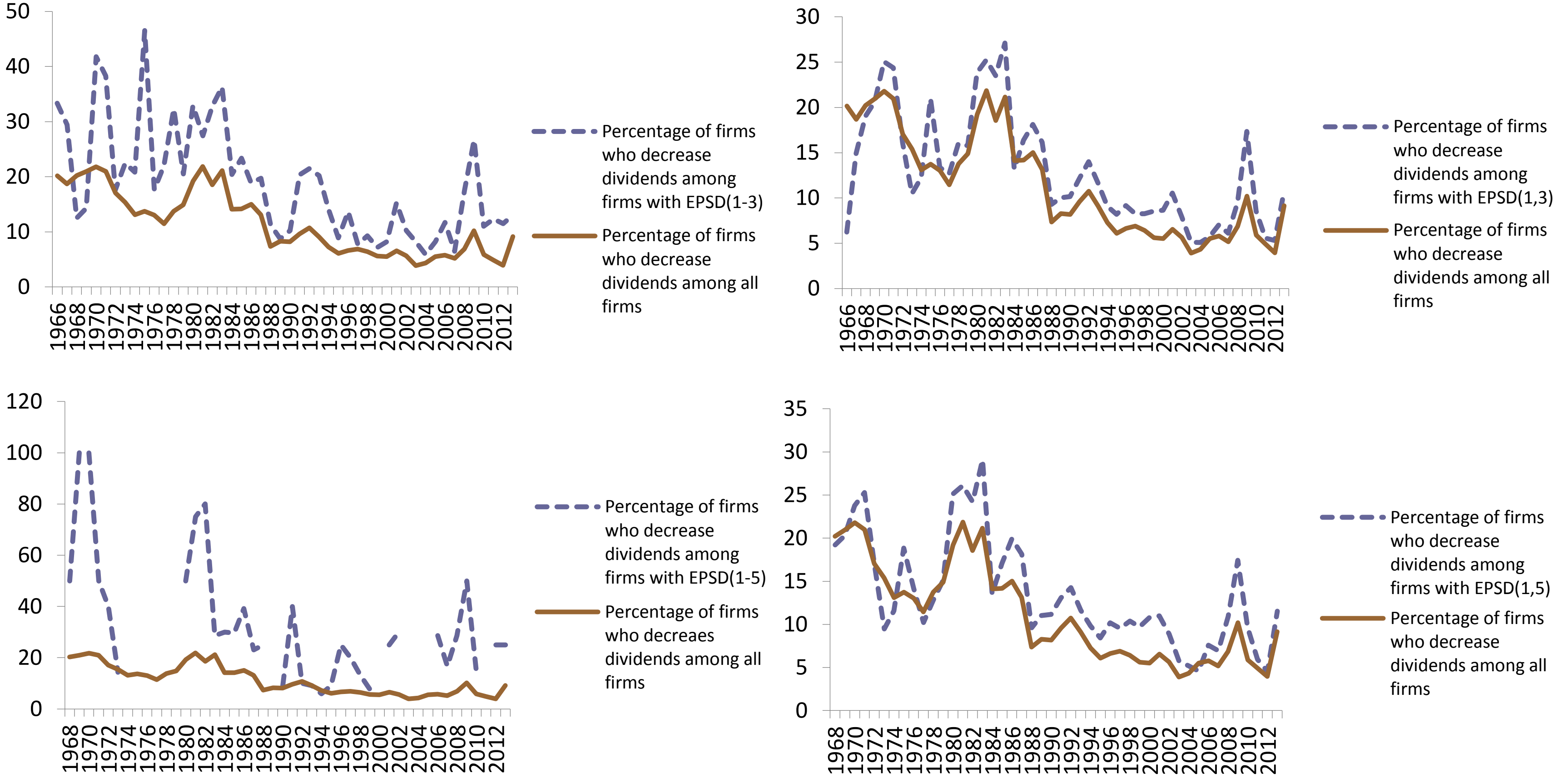


Figure 4.8 The percentage of firms that decrease dividends among all firms and the percentage of firms that decrease dividends among firms with earnings declines over the past three years or past five years

Figure 4.8 contains four sub-figures that respectively show time-series movements in the intersections of firms that decrease dividend and also experience past earnings declines over the past three years (*EPSD(1-3)*, *EPSD(1,3)*) and past five years (*EPSD(1-5)*, *EPSD(1,5)*), together with proportion of firms that decrease dividends among all firms.



4.3.2. Results of logistic regressions for the whole time period from 1963 to 2013

By following the method used by Baker and Wurgler (2004a) and Hoberg and Probhala (2009), we run regressions based on the extended sample from 1963 to 2013. Table 4.2 to Table 4.5 give details from Fama-Macbeth logistic regressions between dividend-decision variables and their conventional determinant factors and provide relationships between residuals from these Fama-Macbeth logistic regressions and behavioural factors including dividend premium of Baker and Wurger (2004a) and indicators proxy for managerial extrapolation.

In further detail, the first part (Panel A) in Table 4.2 is the result from the Fama-Macbeth logistic regression of dividend-initiation decisions (*newpayer*) on conventional factors including size, investment opportunities, profitability, and risk factors. Size (*NYP*) is the same to the NYSE percentile as in Fama and French (2001), and it represents a firm's size in the market. *M/B* ratio and Δ*A/A* are proxy for firms' growth opportunities. *E/A* represents firms' current profitability, and it could also be viewed as a variable of current earnings performance. We apply Hoberg and Prabhala (2009)'s risk factors in Baker and Wurgler (2004a)'s method in Panel A of Table 4.1, but give both results with or without controlling risk factors for robustness check. We use propensity to initiate (*PTI)* as the dependent variable in Panel B and Panel C of Table 4.1. Because Hoberg and Prabhala (2009) discuss changes in propensity to initiate (Δ*PTI)*, we also use Δ*PTI* as the dependent variable in Panel D and Panel E of Table 4.1. All panels excluding Panel A in Table 4.2 allow us to compare the effect of investors' sentiments on firms' payout decisions with the effect of managers' extrapolation on firms' payout decisions.

Table 4.2 Decision to be new dividend payers and determining factors from 1963 to 2013

Table 4.2 reports the two-step regression of firm's' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to initiate (*PTI*). At second step we use pooled method to regression *PTI* on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B, Panel C, Panel D, and Panel E which respectively report *PTI* without controlling for risks, ΔPTI without controlling for risks, *PTI* after controlling for risks, and ΔPTI after controlling for risks on $VW\ P^{D-ND}$ and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (*ΔA/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: Newpayer				
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-3.43***(-15.9)	1.5***(7.39)	-0.17(-1.05)	-0.84***(-3.76)	9.3***(5.41)			
-2.76***(-14.42)	1.44***(4.63)	-0.67***(-4.45)	-0.45***(-3.96)	5.95***(8.61)	-69.72***(-6.84)	-23.21***(-7.23)	
			Panel B. PTI without controlling risk factors				
Intercept	***$VW\ P^{D-ND}$***	***EPSG (5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	***R^2***
0.02***(5.92)	0.17***(14.91)	0.01(1.05)				30198	0.01
0.01**(2.26)	0.16***(15.58)		0.02***(7.87)			34429	0.01
0.01***(5.99)	0.16***(17.51)			0.01***(3.49)		41198	0.01
0.01*(1.90)	0.16***(17.81)				0.02***(9.23)	43962	0.01
			Panel C. PTI after controlling risk factors				
0.02***(6.3)	0.18***(15.74)	0.01(0.88)				29496	0.01
0.01***(3.5)	0.18***(16.31)		0.02***(7.15)			32168	0.01
0.02***(6.14)	0.17***(18.36)			0.01***(3.24)		40238	0.01
0.01***(2.87)	0.17***(18.44)				0.02***(8.48)	41584	0.01

Table 4.2 (continue)							
Panel D. ∆PTI without controlling risk factors							
0.05***(17.61)	0.17***(14.76)	0.02***(3.99)				28960	0.01
0.03***(11.42)	0.17***(15.75)		0.03***(15.18)			31530	0.02
0.04***(18.89)	0.16***(17.53)			0.03***(9.28)		39703	0.02
0.03***(12.01)	0.16***(17.75)				0.03***(17.33)	40979	0.02
Panel E. ∆PTI after controlling risk factors							
Intercept	***VW*** P^{D-ND}	***EPSG (5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	R^2
0.05***(17.02)	0.15***(13.18)	0.03***(4.12)				28288	0.01
0.03***(10.83)	0.16***(14.14)		0.03***(15.04)			30783	0.02
0.05***(18.03)	0.15***(15.64)			0.03***(9.59)		38779	0.01
0.03***(11.23)	0.15***(15.86)				0.03***(17.25)	39996	0.02

In the out-of-sample testing period from 1963 to 2013, we find similar conclusions from Table 4.2 to conclusions in Table 3.3 in Chapter 3 which uses the sample from 1963 to 2000. Panel A in Table 4.2 tests relations between firms' decisions to initiate dividends and conventional factors including size, market-to-book ratio, asset growth, profitability, and risk. Apart from the finding that asset growth has a significant negative effect on the decision to initiate dividends when risk factors are controlled, other conventional factors show similar results as in Baker and Wurgler (2004a). Panel B to Panel E in Table 4.2 jointly test the effects of investor sentiment proxy by Baker and Wurgler (2004a)'s dividend premium and managerial overextrapolation proxy by EPS growth over the past three or five years. Despite the fact that *EPSG(1-5)* has insignificant impact on the propensity to initiate because of the limited number of observations which we have discussed in Chapter 3, all other proxy for managerial extrapolation have a significant positive effect on *PTI* or Δ*PTI.* On the other hand, dividend premium's positive effects on both *PTI* and Δ*PTI* are robust.

Table 4.3 uses the same structure as Table 4.2 in forming Panel A, Panel B, and Panel C. Panel A contains results of the dependent variable of dividend continuation (*continue*) on conventional factors including size, profitability, investment opportunity and risk. By using Panel A's residuals as the dependent variable of propensity to continue dividends (*PTC*), Panel B and Panel C record separately the impacts of dividend premium and managerial extrapolation on propensity to continue dividends

Table 4.3 Decision to continue dividends and determining factors from 1963 to 2013

Table 4.3 reports the two-step regression of firm's' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to continue (*PTC*). At second step we use pooled method to regression *PTC* on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B and Panel C, which respectively report *PTC* without controlling for risks and *PTC* after controlling for risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. Dependent variable: Divcontinue							
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
0.9***(3.91)	3.92***(6.57)	3.02(1.3)	-0.25(-0.59)	33.92(1.5)			
2.91***(5.83)	3.43***(5.7)	0.94(1.19)	0.28(1.24)	21.62*(1.76)	-86.32**(-2.36)	-56.36***(-4.9)	
Panel B. PTC without controlling risk factors							
Intercept	***VW P^{D-ND}***	***EPSG (5)***	***EPSG(1,5)***	**EPSG(1-3)**	***EPSG(1,3)***	***N***	***R^2***
0.01 (-1.45)	-0.01(-1.24)	0.01 (0.51)				37783	0.00
-0.01***(-4.55)	-0.01(-1.23)		0.01***(6.77)			39099	0.00
-0.01***(-3.01)	-0.02**(-2.01)			0.01**(2.08)		43624	0.00
-0.02***(-6.28)	-0.02**(-2.28)				0.02***(8.12)	44362	0.00
Panel C. PTC after controlling risk factors							
0.01 (-1.25)	0.02***(2.61)	0.01 (1.13)				36718	0.00
-0.01***(-4.06)	0.02**(2.32)		0.02***(7.92)			37591	0.00
-0.01***(-2.73)	0.02**(2.18)			0.01***(2.84)		42416	0.00
-0.02***(-5.7)	0.01(1.5)				0.02**(9.2)	42781	0.00

Different from Baker and Wurgler (2004a)'s findings, Panel A in Table 4.3 shows that firms' asset growth may have no significant effect on *PTC*. Another interesting finding is that dividend premium shows a negative effect on *PTC* when risk factors are not considered in Panel A's regression, but dividend premium regains its positive effects on *PTC* when risk factors are controlled in Panel A. Considering the fact that risk is essential in explaining firms' dividend decisions (Hoberg and Prabhala, 2009), the results for *DP* in Panel C are more reasonable. No matter whether risk factors are controlled for or not, representatives for managerial extrapolation show robust significant positive effects on *PTC*.

Table 4.4 Decision to increase dividends and determining factors from 1963 to 2013

Table 4.4 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to increase dividends (*PTIN*). At second step we use pooled method to regression *PTIN* on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B and Panel C which respectively report *PTIN* without controlling risks and *PTIN* after controlling risks on $VW\ P^{D-ND}$ and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (*ΔA/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1 In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: Divincrease				
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-1.24***(-11.77)	1.01***(11.13)	0.36**(2.42)	-0.07(-1.42)	8.91***(10.8)			
-0.74***(-4.54)	0.94***(9.67)	0.35**(2.05)	-0.06(-1.39)	8.88***(10.62)	-19.39**(-2.42)	-11.62***(-4.51)	
			Panel B. PTIN without controlling risk factors				
Intercept	***$VW\ P^{D-ND}$***	***EPSG (5)***	***EPSG(1,5)***	**EPSG(1-3)**	***EPSG(1,3)***	***N***	***R^2***
0.02**(2.25)	0.31***(16.36)	0.08***(7.92)				39139	0.01
-0.04***(-5.08)	0.3***(16.09)		0.10***(21.28)			40589	0.02
0.01 (0.77)	0.28***(16.48)			0.10***(16.77)		45366	0.01
-0.04***(-6.59)	0.26***(15.53)				0.12***(26.92)	46171	0.02
			Panel C. PTIN after controlling risk factors				
0.01(1.24)	0.33***(17.41)	0.08***(7.25)				38036	0.01
-0.04***(-5.71)	0.32***(17.15)		0.10***(20.26)			38988	0.02
0.01 (-0.71)	0.30***(17.34)			0.09***(16.1)		44112	0.02
-0.05***(-7.65)	0.28***(16.3)				0.12***(25.84)	44505	0.02

Table 4.4 is the same as Table 4.3 except that the dependent variable in Panel A is replaced by indicator for increasing dividends (*increase*) and dependent variables in Panel B and Panel C are exchanged into propensity to increase dividends (*PTIN*). In Table 4.4, asset growth and profitability both positively affect firms' decisions to increase dividends. This finding implies that previous dividend payers with sufficient funds to extend themselves also have enough cash to increase dividends. In Panel B and Panel C of Table 4.4, both dividend premium and proxies for managerial extrapolation activities keep their explanatory power in explaining firms' propensities to increase dividends

Table 4.5 Decision to be dividend payers and determining factors from 1963 to 2013

Table 4.5 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to pay (*PTP*). At second step we use pooled method to regression ΔPTP on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B and Panel C which respectively report ΔPTP without controlling risks and ΔPTP after controlling risk factors on $VW\ P^{D-ND}$ and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

***Panel A. Dependent variable*: Payer**							
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-1.70***(-8.97)	4.11***(23.1)	-1.02***(-4.65)	-0.66***(-9.66)	10.51***(6.42)			
1.19***(4.30)	3.29***(11.08)	-1.35***(-7.61)	-0.44***(-7.69)	8.84***(5.42)	-112.27***(-8.56)	-70.13***(-14.47)	
Panel B. ΔPTP without controlling risk factors							
Intercept	$VW\ P^{D-ND}$	***EPSG (5)***	***EPSG(1,5)***	**EPSG(1-3)**	***EPSG(1,3)***	***N***	R^2
0.01***(2.65)	0.05***(6.46)	0.02***(5.14)				67981	0.00
-0.03***(-10.56)	0.05***(6.06)		0.07***(36.04)			71606	0.02
0.01 (0.77)	0.04***(5.07)			0.04***(15.55)		84822	0.00
-0.03***(-13.14)	0.03***(3.96)				0.07***(41.41)	86579	0.02
Panel C. ΔPTP after controlling risk factors							
0.01 (-1.32)	-0.05***(-5.2)	0.03***(5.26)				66212	0.00
-0.03***(-10.62)	-0.05***(-5.2)		0.05***(25.76)			69727	0.01
-0.01**(-2.44)	-0.06***(-7.48)			0.03***(13.05)		82652	0.00
-0.03***(-12.14)	-0.06***(-8.01)				0.06***(30.63)	84327	0.01

Table 4.5 replaces the dependent variable in Panel A with an indicator of paying dividends (*payer*). Hoberg and Prabhala (2009) focus on changes in propensity to pay (Δ*PTP)*, so we only use Δ*PTP* as the dependent variable in Panel B and Panel C in Table 4.5. Table 4.5 tells the same story as in Hoberg and Prabhala (2009)'s paper. Dividend premium has a significant positive effect on firms' propensities to pay dividends despite whether or not these firms are dividend payers at the last fiscal year, but only before risks are controlled for. Panel C in Table 4.5 shows that the dividend premium's effect on changes in propensity to pay becomes significantly negative given risk factors in the extended sample from 1963 to 2013. The reverse of the impact from the dividend premium on Δ*PTP* from positive to negative is not discussed by previous literature. It could be caused by the fact that investors tend to purchase stocks with a high probability of paying dividends when more firms do not or have decreasing abilities in paying dividends after 2002, especially for the period of the recent financial crisis from 2007 to 2009 which may have reduced firms' abilities in paying dividends and stimulated investors' demand on firms' payout as returns of investment during such a depressive period. Again, proxies for managers' extrapolation activities keep their significant explanatory power in positively affecting Δ*PTP*.

4.3.3. Managers' decisions of omitting dividends and decisions of decreasing dividends: evidence from 1963 to 2013

Since managerial extrapolation can be the activity that managers extrapolate past earnings performance into the future, and past earnings performance can be either positive or negative, managers can extrapolate decline in previous earnings into the future as well. This extrapolation which is based on previously decreasing EPS may cause dividend omission or dividend decrease, as extrapolation of previously increasing EPS can cause dividend initiation/continuation/increase/paying. We examine whether earnings decline over the past three or five years can cause dividend omission in Table 4.6 and dividend decrease in Table 4.7.

The structure of Table 4.6 is close to Table 4.2, Table 4.4, and Table 4.5. However, we use the indicator for omitting dividends as the dependent variable in Panel A in Table 4.6, and we use dependent variables of propensity to omit dividends (*divomission*) separately without and after controlling for risks in Panel B and Panel C. Different from previous tables of regression results, Panel B and Panel C in Table 4.6 use indicators for EPS decrease over the past three or five years as proxy for managerial extrapolation in explaining *PTO*.

Table 4.6 Decision to omit payers and determining factors from 1963 to 2013

Table 4.6 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to omit dividends (*PTO*). At second step we use pooled method to regression *PTO* on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' past declines in EPS (*EPSD(1-3), EPSD(1,3), EPSD(1-5),* and *EPSD(1,5)*). The second step is divided into Panels B and Panel C which respectively report *PTO* without controlling risks and *PTO* after controlling risks on VW P^{D-ND} and indicator of firms' past declines in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: Divomission				
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-0.90***(-3.91)	-3.92***(-6.57)	-3.02(-1.3)	0.25(0.59)	-33.92(-1.5)			
-2.91***(-5.83)	-3.43***(-5.7)	-0.94(-1.19)	-0.28(-1.24)	-21.62*(-1.76)	86.32**(2.36)	56.36***(4.9)	
			Panel B. PTO without controlling risk factors				
Intercept	***VW P^{D-ND}***	***EPSD (5)***	***EPSD(1,5)***	***EPSD(1-3)***	***EPSD(1,3)***	***N***	***R^2***
0.01(1.38)	0.01(1.23)	0.02(1.16)				37783	0.00
0.01(0.47)	0.01(1.19)		0.01***(5.69)			39099	0.00
0.01*(1.75)	0.02**(2.3)			0.04***(9.32)		43624	0.00
0.01(1.16)	0.02**(2.2)				0.01***(7.19)	44362	0.00
			Panel C. PTO after controlling risk factors				
0.01(1.07)	-0.02***(-2.61)	0.05***(3.53)				36718	0.00
0.01(-1.12)	-0.02**(-2.32)		0.02***(7.92)			37591	0.00
0.01(1.16)	-0.01*(1.86)			0.04***(11.27)		42416	0.00
0.01(-0.47)	-0.01(-1.50)				0.02***(9.2)	42781	0.00

Panel A in Table 4.6 shows that factors that affect firms' decisions to initiate/pay dividends can also affect firms' decisions of omitting dividends in the opposite direction. Among four indicators created to represent firms' past earnings decrease, except *EPSD(1-5)* which has limited observations, *EPSD(1,5)*, *EPSD(1-3)*, and *EPSD(1,3)* have robust and significantly positive effects on firms' propensity to omit dividends. Besides, although dividend premium has an insignificant effect on *PTO* without controlling for risks in Panel B, its negative effect on *PTO* is stable after controlling for risks in Panel C.

Table 4.7 Decision to decrease determinants and determining factors from 1963 to 2013

Table 4.7 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to omit dividends (*PTD*). At second step we use pooled method to regression *PTD* on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' past declines in EPS (*EPSD(1-3), EPSD(1,3), EPSD(1-5),* and *EPSD(1,5)*). The second step is divided into Panels B and Panel C which respectively report *PTD* without controlling risk factors and *PTD* after controlling risks on $VW\ P^{D-ND}$ and indicators of firms' past declines in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: Divdecrease				
Intercept	***NYP***	**Δ*A/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-0.53***(-3.7)	-1.31***(-8.23)	-0.01(-0.05)	0.28**(2.47)	-4.31**(-2.13)			
-1.74***(-9.85)	-0.45(-1)	-0.07(-0.32)	-0.1(-0.23)	2.55(0.32)	-15.49(-0.51)	31.27(7.04)	
			Panel B. PTD without controlling risk factors				
Intercept	$VW\ P^{D-ND}$	***EPSG (5)***	***EPSG(1,5)***	**EPSG(1-3)**	***EPSG(1,3)***	***N***	R^2
0.01**(2.28)	-0.16***(-10.1)	0.18***(6.51)				37783	0.00
0.01(1.4)	-0.16***(-10.01)		0.02***(5.39)			39099	0.00
0.01(1.64)	-0.14***(9.56)			0.12***(14.47)		43624	0.00
0.01(0.71)	-0.14***(-9.49)				0.03***(9.03)	44362	0.01
			Panel C. PTD after controlling risk factors				
0.03***(4.16)	-0.17***(-10.4)	0.22***(7.76)				36718	0.01
0.01(1.35)	-0.17***(-10.27)		0.04***(9.43)			37591	0.01
0.02***(3.49)	-0.15***(-10.14)			0.14***(16.83)		42416	0.01
0.01(0.86)	-0.15***(-9.66)				0.05***(13.34)	42781	0.01

Table 4.7 is created for the purpose similar to that used to create Table 4.6, but we use the indicator for decreasing dividends instead of the indicator for omitting dividends in Panel A, and use the propensity to decrease dividends (*PTD*) instead of *PTO* in Panel B and Panel C. Although Panel A in Table 4.7 claims a bad model fitting for the logistic regression of dividend decrease's indicator on conventional factors, *EPSD(1-5)*, *EPSD(1,5)*, *EPSD(1-3)*, and *EPSD(1,3)* all impact firms' propensities to decrease dividends. Meanwhile, dividend premium also keeps its significant negative effect on *PTD* with or without controlling for risks.

4.3.4. Robustness test by using alternative dependent variables: S3newpayer and S5newpayer's evidence from 1963 to 2013

We create "strong" dependent variables which represent firms' payout status at fiscal year t, when firms' payout statuses are also considered over the past three or five years. Because these two "strong" dependent variables (*S3newpayer* and *S5newpayer*) can only be applied in Baker and Wurgler (2004a)'s method in setting the dependent variable which use dependent variables with the condition of being past non-payers, we only report the results of running similar regression on S3newpayer by using other explanatory variables in Table 4.8 and the results of regression on S5newpayer by other independent variables in Table 4.9 from 1963 to 2013.

Table 4.8 Decision to be strong new dividend payers (S3newpayer) and determining factors from 1963 to 2013

Table 4.8 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to "strong" initiate (*PTS3I*). At second step we use pooled method to regression *PTS3I* on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)* and *EPSG(1,3)*). The second stage is divided into Panels B, Panel C, Panel D, and Panel E which respectively report *PTS3I* without controlling risks, *PTS3I* after controlling for risks, Δ*PTS3I* without controlling for risks, and Δ*PTS3I* after controlling for risks on $VW\ P^{D-ND}$ and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: S3newpayer			
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***
-4.42***(-15.35)	1.95***(5.16)	-0.2(-1.05)	-0.89***(-6.3)	5.05***(5.04)		
-3.53***(-6.37)	1.29**(2.18)	-0.74**(-2.48)	-0.92***(-5.66)	5.33***(4.32)	23.87(1.34)	-25.2***(-3.88)
			Panel B. PTS3I without controlling risk factors			
Intercept	$VW\ P^{D-ND}$	***EPSG (3)***	***EPSG(1,3)***	***N***	R^2	
0.04***(15.85)	0.17***(17.95)	0.02***(5.79)		41198	0.01	
0.03***(11.04)	0.16***(18.23)		0.02***(12.01)	43962	0.02	
			Panel C. PTS3I after controlling risk factors			
0.04***(15.89)	0.16***(17.35)	0.02***(5.98)		40238	0.01	
0.03***(11.36)	0.16***(17.46)		0.02***(11.7)	41584	0.02	
			Panel D. ΔPTS3I without controlling risk factors			
0.05***(19.39)	0.16***(17.93)	0.02***(7.93)		39702	0.01	
0.03***(13.58)	0.16***(18.13)		0.03***(14.24)	40979	0.02	
			Panel E. ΔPTS3I after controlling risk factors			
0.05***(18.97)	0.16***(17.64)	0.02***(8.11)		38779	0.02	
0.03***(13.19)	0.16***(17.84)		0.03***(14.23)	39996	0.02	

Table 4.8 is similar to Table 4.1, but different in using the indicator for being initiator at current fiscal year t after being non-payers over the past three years (*S3newpayer*) as the dependent variable in Panel A, and propensity to being initiator after being non-payers for three years (PTS3I). Apart from systematic risk, firms' size, investment opportunities and profitability have a similar impact on firms' decisions of being "strong" initiators as has been found in Table 4.1. Investor sentiment (dividend premium) on dividends and managerial extrapolation based on earnings growth over the past three years have robust and significant effects of firms' propensities to "strongly" initiate dividends after experiencing three years' status of being non-payers.

Table 4.9 Decision to be strong new dividend payers (S5newpayer) and determining factors from 1963 to 2013

Table 4.9 reports the two-step regression of firms'' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 1963 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to "strong" initiate (*PTS5I*). At second step we use pooled method to regression *PTS5I* on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-5)* and *EPSG(1,5)*). The second stage is divided into Panels B, Panel C, Panel D, and Panel E which respectively report *PTS5I* without controlling risks, *PTS5I* after controlling for risks, Δ*PTS5I* without controlling for risks, and Δ*PTS5I* after controlling for risks on $VW\ P^{D-ND}$ and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: S5newpayer			
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***
-4.95***(-13.9)	2***(4.83)	-0.11(-0.5)	-0.88***(-5.84)	4.66***(9.23)		
-3.12***(-7.21)	1.42(1.44)	0.54(0.44)	-1.94(-1.82)	9.69**(2.25)	101.89(1.18)	-95.9(-1.48)
			Panel B. PTS5I without controlling risk factors			
Intercept	$VW\ P^{D-ND}$	***EPSG (5)***	***EPSG(1,5)***	***N***	R^2	
0.05***(16.23)	0.18**(15.25)	0.02***(2.59)		30198	0.01	
0.03***(12.02)	0.17***(15.98)		0.02***(10.89)	34429	0.02	
			Panel C. PTS5I after controlling risk factors			
0.05***(17.24)	0.17***(14.77)	0.02**(2.54)		29496	0.01	
0.04***(13.25)	0.17***(15.37)		0.02***(10.53)	32168	0.02	
			Panel D. ΔPTS5I without controlling risk factors			
0.05***(17.85)	0.17***(14.96)	0.02***(3.42)		28960	0.01	
0.04***(12.78)	0.17***(15.84)		0.03***(12.25)	31530	0.02	
			Panel E. ΔPTS5I after controlling risk factors			
0.05***(17.61)	0.17***(14.92)	0.02***(3.55)		28288	0.01	
0.04***(12.44)	0.17***(15.8)		0.03***(12.4)	30783	0.02	

Table 4.9 is similar to Table 4.8, but different in using the indicator of being initiator at current fiscal year t after being non-payers over the past five years (*S5newpayer*) as the dependent variable in Panel A, and propensity to being initiator after being non-payers for three years (*PTS5I*). Table 4.9 shows that only *M/B* and profitability have a significant effect on firms' decision to initiate dividends after being non-payers for five years. Among them, *M/B* proxy for the investment opportunity only has weak significance at the 90% critical level. It may indicate that only sufficient earnings can be the support to encourage managers to initiate dividends, when firms have been keeping their status of being non-payers for a long time period (5-year is longer compared with 3-year). Besides, investor sentiment (dividend premium) on dividends and managerial extrapolation proxy earnings growth over the past five years has robust and significant effects on firms' propensities to initiate dividends after being non-payers for five years.

4.3.5. Results of logistic regressions for the out-of-sample period from 2001 to 2013

It is not hard to find that some conventional factors do not have the same effect on firms' dividend decisions as previous literature claims in the whole extended sample from 1963 to 2013. Thus, we separately run regression by only using the data of the out-of-sample period from 2001 to 2013. Table 4.6 to Table 4.9 are the same regression models as in Table 4.2 to Table 4.5, but under different time periods.

Table 4.10 Decision to be new dividend payers and determining factors from 2001 to 2013

Table 4.10 reports the two-step regression of firm's' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 2001 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to initiate (*PTI*). At second step we use pooled method to regression PTI on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B, Panel C, Panel D, and Panel E which respectively report PTI without controlling for risks, ΔPTI without controlling for risks, PTI after controlling for risks, and ΔPTI after controlling for risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. dependent variable: Newpayer

Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***
-3.72***(-24.31)	1.11***(5.39)	-0.84***(-3.72)	-0.35***(-3.48)	5.33***(7.5)		
-2.68***(-7.2)	0.74**(2.35)	-2.2***(-6.28)	-0.3***(-3.89)	6.67***(7.05)	-31.57**(-2.95)	-21.43***(-3.17)

Panel B. PTI without controlling risk factors

Intercept	***VW P^{D-ND}***	***EPSG (5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	R^2
0.02***(4.44)	0.11***(4.28)	0.01(0.16)				12400	0.01
0.01**(2.14)	0.11***(4.59)		0.02***(4.81)			14074	0.01
0.02***(4.68)	0.12***(5.36)			0.01(0.92)		15547	0.01
0.01**(2.41)	0.12***(5.36)				0.01***(4.66)	16483	0.01
Panel C. PTI after controlling risk factors							
0.02***(4.24)	0.12***(4.49)	0.01(0.01)				10771	0.01
0.01**(2.41)	0.12***(4.87)		0.01***(4.22)			11715	0.01
0.02***(4.37)	0.13***(5.65)			0.01(0.77)		13457	0.01
0.01**(2.52)	0.13***(5.74)				0.01***(4.05)	13841	0.01

Table 4.10 (continue)							
Panel D. △PTI without controlling risk factors							
0.05***(9.53)	0.08**(2.51)	0.02(1.51)				12207	0.01
0.03***(6.75)	0.09***(3.12)		0.03***(6.66)			13349	0.01
0.04***(10.14)	0.09***(3.47)			0.01***(2.77)		15336	0.01
0.03***(7.2)	0.10***(3.73)				0.02***(6.37)	15825	0.01
Panel E. △PTI after controlling risk factors							
Intercept	***VW P^{D-ND}***	***EPSG (5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	***R^2***
0.04***(9.01)	0.04(1.21)	0.02(1.50)				10609	0.01
0.03***(6.43)	0.05*(1.82)		0.02***(6.31)			11549	0.01
0.04***(9.55)	0.05**(2.05)			0.01***(2.91)		13279	0.01
0.03***(6.72)	0.06**(2.29)				0.02***(6.21)	13662	0.01

Table 4.10 is the same as Table 4.2 in its structure and use of variables, but is based on a sample from 2001 to 2013 instead of from 1963 to 2000. It is surprising to find that Table 4.10 shows an insignificant impact of *EPSG(1-3)* on PTN. Figure 4.1's first (top left) figure shows that percentages of new dividend payers achieve sub-bottoms twice which are both 1-year before sub-bottoms of *EPSG(1-3)*'s percentage after 2000 in 2001 and 2009. This lagged response may be the cause of this insignificant relationship. As we standardise the definition of EPSG as EPS growth over the past few years which excludes the current fiscal year, but some dividend decisions may be made when firms' current year's performances are also taken into consideration, managers may make dividend decisions after observing current increases in EPS with past growth in EPS. Besides, dividend initiation is different from dividend continuation/increase/paying in terms of being non-payers in the last fiscal year. It can be harder for managers to make decisions of changing "non-dividend" to "positive dividends" than other dividend decisions. On the other hand, we have discussed in Section 4.3.1 that past two-year or four-year increases in EPS can also affect managers' dividend decisions. Therefore, managers can only tend to initiate dividends after two-year increases in EPS with a current increase in EPS to make sure about their predictions on future earnings performance from extrapolation.[17] As a summary, all EPS-related indicators have a significant impact on firms' dividend decisions, except the situation that *EPSG(1-5)* or *EPSG(1-3)* has no significant impact on *PTN*, but they still show a positive relation with *PTN*. In other words, conclusions from Table 4.10 generally support conclusions from Table 4.1.

[17] We replace EPSG(1-3) with leaded EPSG(1-3) which represents a past two-year increase in EPS with a current increase in EPS in Table 4.9's Panel B and Panel C, and regression results give positive significance at 95% critical level for the model without controlling risk factors, and positive significance at 90% critical level for the model after controlling risk factors.

Table 4.11 Decision to continue dividends and determining factors from 2001 to 2013

Table 4.11 reports the two-step regression of firm's' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 2001 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to continue (*PTC*). At second step we use pooled method to regression *PTC* on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B and Panel C, which respectively report *PTC* without controlling for risks and *PTC* after controlling for risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. Dependent variable: Divcontinue

Intercept	*NYP*	*ΔA/A*	*M/B*	*E/A*	*Sys risk*	*Idi risk*
0.90***(3.23)	2.94***(14.72)	0.78(1.49)	0.32(1.73)	4.34***(5.27)		
3.41***(8.93)	1.84***(7.14)	0.12(0.19)	0.35(1.66)	3.73***(6.16)	1.89(0.08)	-65.46***(-10.02)

Intercept	*VW P^{D-ND}*	*EPSG (5)*	*EPSG(1,5)*	*EPSG(1-3)*	*EPSG(1,3)*	*N*	R^2
Panel B. PTC without controlling risk factors							
-0.01**(-2.13)	-0.14***(-4.33)	0.02**(2.01)				8389	0.01
-0.03***(-4.54)	-0.12***(-3.8)		0.03***(6.79)			8715	0.01
-0.02***(-3.03)	-0.13***(-4.15)			0.02***(3.40)		8937	0.01
-0.03***(-4.83)	-0.12***(-3.88)				0.03***(6.79)	9097	0.01
Panel C. PTC after controlling risk factors							
-0.01**(-2.25)	-0.07**(-2.24)	0.02*(1.92)				8125	0.00
-0.02***(-3.62)	-0.05*(-1.74)		0.02***(5.77)			8347	0.00
-0.02***(-2.95)	-0.07**(-2.12)			0.01***(2.67)		8662	0.00
-0.02***(-3.84)	-0.06**(-2.05)				0.02***(4.36)	8740	0.00

We design Table 4.11 by following Table 4.2, but run regressions in Table 4.11 based on the sample from 2001 to 2013. We find similar findings from Table 4.11 as the findings from Table 4.2. except that the systematic risk does not exhibit significant effects on managers' decisions on continuing dividends, all other factors' results are similar between Table 4.11 and Table 4.2. However, dividend premium has a significant negative relation with *PTC* in Table 4.11. As has been discussed in Section 4.3.2, it may be caused by the financial crisis from 2007 to 2009 when dividend premium was fluctuating on a sub-bottom[18] while firms' decision of continuing dividends are driven more by the sub-peak of EPSG indicators, although EPSG indicators are slightly decreasing from the sub-bottom in 2006 (see Figure 4.1's top right figure). Based on conventional theory and Hoberg and Prabhala (2009)'s findings, dividend premium which is calculated by using M/B ratio, should be mainly explained by firms' systematic risk. Our findings reveal that in the most recent period from 2001 to 2013, when dividend premium can still be "contaminated" by systematic risk and idiosyncratic risk, there may still be unobserved components which can be represented by dividend premium and cannot be explained by risk factors in explaining firms' decisions of continuing to pay dividends. We will not discuss these phenomena further because they are unrelated with this chapter's main topic. This thesis focuses on the impact of managerial extrapolation on dividend decisions, and EPS-related indicators survive after controlling for risk factors and dividend premiums in the out-of-sample material from 2001 to 2013.

[18] We do not show the movement of dividend premiums in this chapter, but descripe the findings.

Table 4.12 Decision to increase dividends and determining factors from 2001 to 2013

Table 4.12 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 2001 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to increase dividends (*PTIN*). At second step we use pooled method to regression *PTIN* on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B and Panel C which respectively report *PTIN* without controlling risks and *PTIN* after controlling risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth ($\Delta A/A$) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: Divincrease				
Intercept	***NYP***	***$\Delta A/A$***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-1.23***(-6.16)	1.21***(5.77)	-0.2(-1.48)	0.17***(3.73)	5.46***(6.93)			
-0.15(-0.5)	1.11***(8.57)	-0.48**(-2.35)	0.13***(3.08)	5.29***(7.59)	-45.66***(-6.28)	-19.19**(-2.83)	
			Panel A. PTI without controlling risk factors				
Intercept	***VW P^{D-ND}***	***EPSG (5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	***R^2***
0.01(0.07)	0.01(0.11)	0.08***(3.62)				8886	0.01
-0.05***(-3.73)	0.07(0.98)		0.11***(11.43)			9263	0.02
-0.01(-0.74)	0.03(0.47)			0.08***(6.63)		9523	0.01
-0.05***(-3.96)	0.06(0.85)				0.11***(11.58)	9708	0.02
			Panel B. PTI after controlling risk factors				
0.01(1.06)	0.16**(2.14)	0.08***(3.34)				8606	0.01
-0.04***(-2.82)	0.23***(3.00)		0.11***(10.81)			8859	0.02
0.01(0.23)	0.18**(2.36)			0.07***(5.66)		9233	0.01
-0.03**(-2.42)	0.20***(2.66)				0.09***(9.07)	9320	0.01

Table 4.12 is the same as Table 4.4, but different in the sample period which is 2001 to 2013. In terms of the differences between Table 4.12 and Table 4.4, Panel A in Table 4.12 claims that the M/B rather than asset growth has significant positive effects on firms' decisions of increasing dividends, which is different from the findings in Table 4.4. Because both asset growth and the M/B ratio are proxy for firms' investment opportunities, there is no difference for the conclusions made based on Table 4.12 as the conclusion can also be made based on Table 4.4: past dividend payers who have sufficient funds tend to re-invest in themselves, while they are increasing dividend payments.

Table 4.13 Decision to be dividend payers and determining factors from 2001 to 2013

Table 4.13 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 2001 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to pay (*PTP*). At second step we use pooled method to regression ΔPTP on Baker and Wurgler (2004a)'s dividend premium (VW $\mathrm{P}^{\mathrm{D-ND}}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The second step is divided into Panels B and Panel C which respectively report ΔPTP without controlling risks and ΔPTP after controlling risk factors on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (*ΔA/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. Dependent variable: Payer						
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***
-2.01***(-17.85)	3.10***(24.15)	-1.09***(-4.56)	-0.41***(-12.72)	6.61***(15.29)		
1.10***(4.23)	1.39***(6.35)	-1.91***(-6.46)	-0.31***(-21.58)	5.82***(8.57)	-16.46(-1.54)	-85.68***(-10.66)

Panel A. ΔPTP without controlling risk factors							
Intercept	***VW P^{D-ND}***	***EPSG (5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	***R^2***
0.01*(1.96)	0.11***(3.62)	0.01(1.31)				19090	0.00
-0.02***(-2.85)	0.14***(4.68)		0.05***(12.1)			20347	0.01
0.01*(1.75)	0.14***(4.98)			0.03***(5.82)		22361	0.00
-0.02***(-3.02)	0.17***(5.98)				0.05***(13.92)	22867	0.01
Panel B. ΔPTP after controlling risk factors							
-0.01*(-1.66)	-0.43***(-13.33)	0.01(1.41)				18645	0.01
-0.03***(-4.58)	-0.38***(-11.98)		0.03***(8.24)			19890	0.01
-0.01(-1.49)	-0.39***(-13.15)			0.02***(4.22)		21892	0.01
-0.02***(-4.2)	-0.36***(-12.1)				0.03***(8.75)	22394	0.01

Table 4.13 has the same structure to Table 4.5, and shows a similar relationship between decisions of paying dividends and their determinants. The only difference between the results of Table 4.13 and Table 4.5 is that systematic risk has no significant impact on firms' decisions of paying dividends. Jointly considered with Table 4.11 which also shows the insignificant effect of systematic risk on dividend decisions, managers may become less concerned about compensating investors for their low risk related to the market than their low individual risk since 2001 when they are making decisions to continue/pay dividends. Dividend premium has a negative effect on changes in propensity to pay in Panel C in Table 4.13 when risk factors are controlled, which can be explained by the same reason which has been given in Table 4.11's analysis as well as in Section 4.3.2. Indicators which represent managers' activities show a robust significant positive effect on ΔPTP.

4.3.6. Managers' decisions of omitting dividends and decisions of decreasing dividends: evidence from 2001 to 2013

We also construct Table 4.14 and Table 4.15 by following Table 4.6 and Table 4.7 as extended tests in the out-of-sample period. As in Table 4.6 and Table 4.7, we replace EPS-related dummies from indicators which represent firms' past earnings growth to indicators which represent firms' past earning declines, because we test the determinants of firms' decisions in omitting/decreasing dividends in Table 4.14/Table 4.15.

Table 4.14 Decision to omit payers and determining factors from 2001 to 2013

Table 4.14 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 2001 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to omit dividends (*PTO*). At second step we use pooled method to regression *PTO* on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' past declines in EPS (*EPSD(1-3)*, *EPSD(1,3)*, *EPSD(1-5)*, and *EPSD(1,5)*). The second step is divided into Panels B and Panel C which respectively report *PTO* without controlling risks and *PTO* after controlling risks on VW P^{D-ND} and indicator of firms' past declines in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: Divomission				
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-0.9***(-3.23)	-2.94***(-14.72)	-0.78(-1.49)	-0.32(-1.73)	-4.34***(-5.27)			
-3.41***(-8.93)	-1.84***(-7.14)	-0.12(-0.19)	-0.35(-1.66)	-3.73(-6.16)	-1.89(-0.08)	65.46***(10.02)	
			Panel B. PTO without controlling risk factors				
Intercept	***VW P^{D-ND}***	***EPSD (5)***	***EPSD(1,5)***	***EPSD(1-3)***	***EPSD(1,3)***	***N***	R^2
0.01*(1.83)	0.13***(4.29)	0.13***(4.77)				8389	0.01
0.01(0.12)	0.13***(3.85)		0.03***(6.08)			8715	0.01
0.01*(1.73)	0.13***(4.03)			0.05***(6.04)		8937	0.01
0.01(0.48)	0.13***(3.96)				0.02***(5.78)	9097	0.01
			Panel C. PTO after controlling risk factors				
0.01**(2.01)	0.07**(2.22)	0.07**(2.37)				8125	0.00
0.01(-0.31)	0.05*(1.74)		0.02***(5.77)			8347	0.00
0.01**(2.03)	0.06**(2.05)			0.04***(4.18)		8662	0.00
0.01(0.87)	0.06**(2.05)				0.02***(4.36)	8740	0.00

Based on Table 4.6, we test the determinants of decisions in omitting dividends in Table 4.14. Dividend-omission decisions are the opposite decisions of continuing to pay dividends. As shown in Table 4.6, investment opportunities proxy by asset growth and the M/B ratio become insignificant factors in affecting managers' decisions of omitting dividends. Systematic risk also has no significant effect on decisions to omit dividends in the out-of-sample group, which is different from the results in Table 4.6. The positive relationship between dividend premium and dividend omission can also be explained by investors' reliance on dividends as returns and firms' declining ability in paying dividends (also see Table 4.11's analysis and Section 4.3.2). Indicators which represent past earning declines have a robust significant positive relationship with *PTO*, no matter whether or not risk factors are given.

Table 4.15 shows out-of-sample results of determinants in decreasing dividends. Although there is a bad model fitting in Panel A of Table 4.7 where risk factors are included, we find significant impact of size, *M/B*, profitability, and idiosyncratic risk on decisions of decreasing dividends. Unlike the relationship in Table 4.7 which uses the whole sample period from 1963 to 2013, it seems that dividend premium can positively drive propensity to change dividends in either direction: increase dividends (in Table 4.14) or decrease dividends (in Table 4.15). We attribute the positive effect of dividend premium on *PTD* to the same reason in explaining the positive relationship between dividend premium and *PTO*, but argue that managers take more complicated consideration on decisions of changing dividends after observing investors' dividend requirements from the last fiscal year, jointly with other external factors like the financial crisis during the period 2001 to 2013.

Table 4.15 Decision to decrease determinants and determining factors from 2001 to 2013

Table 4.15 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 2001 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to omit dividends (*PTD*). At second step we use pooled method to regression *PTD* on Baker and Wurgler (2004a)'s dividend premium (*VW* P^{D-ND}) and dummy variables which represent firms' past declines in EPS (*EPSD(1-3)*, *EPSD(1,3)*, *EPSD(1-5)*, and *EPSD(1,5)*). The second step is divided into Panels B and Panel C which respectively report *PTD* without controlling risk factors and *PTD* after controlling risks on *VW* P^{D-ND} and indicators of firms' past declines in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. Dependent variable: Divdecrease							
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***	
-0.38(-1.52)	-1.93***(-11.48)	-0.48*(-1.83)	0.15***(3.36)	-3.53***(-4.09)			
-2.53***(-7.67)	-0.84***(-3.04)	-0.24(-1.13)	0.16***(5.55)	-2.8***(-4.56)	3.81(0.30)	58.18***(7.22)	
Panel B. PTD without controlling risk factors							
Intercept	***VW*** P^{D-ND}	***EPSG (5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***N***	R^2
0.03***(2.96)	0.20***(3.40)	0.19***(3.56)				8389	0.01
0.01(1.28)	0.17***(2.86)		0.03***(3.99)			8715	0.01
0.02**(2.25)	0.20***(3.41)			0.12***(6.9)		8937	0.01
0.01(0.92)	0.19***(3.22)				0.04***(5.62)	9097	0.01
Panel C. PTD after controlling risk factors							
0.04***(3.24)	0.11*(1.90)	0.12**(2.31)				8125	0.01
0.02*(1.80)	0.09(1.47)		0.02***(2.82)			8347	0.01
0.03***(2.77)	0.12**(2.06)			0.08***(4.76)		8662	0.01
0.02**(2.10)	0.12**(2.00)				0.02***(2.99)	8740	0.01

4.3.7. Robustness test by using alternative dependent variables: S3newpayer and S5newpayer's evidence from 2001 to 2013

Following Section 4.3.3's method in forming proper dependent variables which represent dividend initiators' past status of being non-payers for three years or five years, we also create tables to report the same regression results as a robustness check based on the sample from 2001 to 2013.

Table 4.16 is based on Table 4.8 in testing determinants of *S3newpayer* between 2001 and 2013. Systematic risk's influence becomes significant again, which supports the finding in Table 4.10. Because of the "leading" response which has been discussed in Table 4.10's analysis, *EPSG(1-3)* does not show a significant positive relationship with propensity to initiate after being non-payers over the past three years (*PTS3I*). However, *EPSG(1-3)* has a significant effect on Δ*PTS3I* with or without controlling risk factors.

Table 4.16 Decision to be strong new dividend payers (S3newpayer) and determining factors from 2001 to 2013

Table 4.16 reports the two-step regression of firms' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 2001 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to "strong" initiate (*PTS3I*). At second step we use pooled method to regression *PTS3I* on Baker and Wurgler (2004a)'s dividend premium (VW P^{D-ND}) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-3)* and *EPSG(1,3)*). The second stage is divided into Panels B, Panel C, Panel D, and Panel E which respectively report *PTS3I* without controlling risks, *PTS3I* after controlling for risks, Δ*PTS3I* without controlling for risks, and Δ*PTS3I* after controlling for risks on VW P^{D-ND} and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: S3newpayer			
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***
-4.07***(-21.56)	1.06***(5.36)	-0.60**(-2.78)	-0.39**(-2.85)	5.26***(10.05)		
-2.63***(-5.04)	0.34(0.87)	-1.86***(-4.56)	-0.37***(-3.08)	6.73***(9.03)	-22.13**(-2.79)	-30.8***(-3.31)
			Panel B. PTS3I without controlling risk factors			
Intercept	***VW*** P^{D-ND}	***EPSG (3)***	***EPSG(1,3)***	***N***	R^2	
0.03***(7.30)	0.13***(5.39)	0.01(1.30)		15547	0.01	
0.02***(4.95)	0.12***(5.44)		0.01***(5.02)	16483	0.01	
			Panel C. PTS3I after controlling risk factors			
0.03***(6.78)	0.13***(5.52)	0.01(1.18)		15336	0.01	
0.02***(4.76)	0.13***(5.61)		0.01***(4.47)	15825	0.01	
			Panel D. ΔPTS3I without controlling risk factors			
0.04***(10.15)	0.09***(3.29)	0.01***(2.66)		13457	0.01	
0.03***(7.34)	0.09***(3.52)		0.02***(6.04)	13841	0.01	
			Panel E. ΔPTS3I after controlling risk factors			
0.04***(9.65)	0.06**(2.33)	0.01***(2.84)		13279	0.01	
0.03***(6.90)	0.07***(2.55)		0.02***(6.02)	13662	0.01	

Table 4.17 Decision to be strong new dividend payers (S5newpayer) and determining factors from 2001 to 2013

Table 4.17 reports the two-step regression of firms'' dividend decisions on conventional factors, dividend premium and optimistic past earning performance from 2001 to 2013. In Panel A we firstly perform a Fama-Macbeth logistic regression of dividend decision on firms' characteristics with or without controlling risk factors (Hober and Probhala, 2009) to get firms' propensity to "strong" initiate (*PTS5I*). At second step we use pooled method to regression *PTS5I* on Baker and Wurgler (2004a)'s dividend premium ($VW\ P^{D-ND}$) and dummy variables which represent firms' optimistic past EPS performance (*EPSG(1-5)* and *EPSG(1,5)*). The second stage is divided into Panels B, Panel C, Panel D, and Panel E which respectively report *PTS5I* without controlling risks, *PTS5I* after controlling for risks, Δ*PTS5I* without controlling for risks, and Δ*PTS5I* after controlling for risks on $VW\ P^{D-ND}$ and indicators of firms' past growths in EPS. *NYP* is used to represent firms' sizes. Market-to-book ratio (*M/B*) and asset growth (Δ*A/A*) are proxies for a firm's investment opportunities. *E/A* measures a firm's profitability. *Sys risk* is firms' systematic risk and *Idi risk* is firms' idiosyncratic risk in Hoberg and Prabhala (2009). Detailed construction of each variable can be found in Appendix 3.1. In the table, *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

			Panel A. Dependent variable: S5newpayer			
Intercept	***NYP***	***ΔA/A***	***M/B***	***E/A***	***Sys risk***	***Idi risk***
-4.35***(-28.11)	1.15***(6.92)	-0.59**(-2.54)	-0.43**(-2.87)	5.29***(8.08)		
-3.07***(-6.77)	0.46(1.58)	-1.79***(-4.35)	-0.41**(-2.98)	6.72***(8.16)	-18.73*(-2.03)	-26.95**(-2.86)
			Panel B. PTS5I without controlling risk factors			
Intercept	$VW\ P^{D-ND}$	***EPSG (5)***	***EPSG(1,5)***	***N***	R^2	
0.03***(7.83)	0.11***(4.26)	0.01(0.62)		12400	0.01	
0.02***(5.49)	0.11***(4.63)		0.02***(5.43)	14074	0.01	
			Panel C. PTS5I after controlling risk factors			
0.03***(7.51)	0.11***(4.27)	0.01(0.54)		12207	0.01	
0.02***(5.44)	0.12***(4.68)		0.02***(5.03)	13349	0.01	
			Panel D. ΔPTS5I without controlling risk factors			
0.05***(9.51)	0.07***(2.28)	0.02(1.46)		10771	0.01	
0.03***(6.88)	0.08***(2.84)		0.02***(6.26)	11715	0.01	
			Panel E. ΔPTS5I after controlling risk factors			
0.05***(9.19)	0.05*(1.68)	0.02(1.41)		10609	0.01	
0.03***(6.66)	0.06**(2.23)		0.02***(6.07)	11549	0.01	

Table 4.17 follows Table 4.9 in showing regression results, but only runs regression during the time period of 2001-2013. We have similar conclusions from the comparison between results in Table 4.17 and results in Table 4.9 as the comparison between Table 4.16 and Table 4.8: (1) systematic risk's significant impact on *S5newpayer*, and, (2) *EPSG(1-5)*'s insignificant effect on *PTS5I*. However, the insignificance of *EPSG(1-5)*'s results may be caused by the limited number of observations.

4.3.8. Over-optimistic managers and over-pessimistic managers?

As a further check on managers' overreaction, we draw Table 4.18 for a clear and detailed look at future earnings performance for firms who have made dividend decisions. As discussed in Chapter 3, if managerial extrapolation can reflect managers' overreaction to past earnings performance, firms who initiate/continue/increase/pay dividends after experiencing past earnings growth should not have future growing patterns of earnings. On the other hand, firms who omit/decrease dividends after experiencing past earnings decline should not have decreasing earnings in the future.

By following Table 3.10 in Chapter 3, we examine future earnings performance and future growth for several sub-samples: firms who pay dividends at the current fiscal year t (*payer*); firms who initiate dividends at t (*newpayer*); firms who increase dividends at t (*divincrease*); firms who continue dividends at t (*divcontinue*); firms who omit dividends at t (*divomission*); and firms who decrease dividends at t (*divdecrease*) (definitions for all these sub-groups can be found at

Appendix 3.3). We only show results for payer/newpayer/divincrease/divcontinue with previous profitability growth, and divomission/divdecrease with previously declining profitability. For each sub-group with previously growing/declining profitability we examine their future profitability and asset growth during, (1) the whole time period from 1963 to 2013 and (2) the out-of-sample period from 2001 to 2013.

Table 4.18 Future profitability and future investment of firms who have past growing/decreasing EPS and initiate/continue/increase/pay/omit/decrease dividends

Table 4.18 contains two panels. Panel A reports means and growth rates of current profitability (and asset growth) and future 5-year profitability (and asset growth) for firms which experience of past earnings growth and then choose to pay/initiate/increase/continue dividends. Panel B reports means and growth rates of current profitability (and asset growth) and future 5-year profitability (and asset growth) for firms which experience of past earnings decline and then choose to omit/decrease dividends. *E/A* represents firm's profitability at current fiscal year, and *E/A (n)* represents firm's profitability in *n*-year. Growth rate is calculated by using current *E/A* minus *E/A* at previous fiscal year all divided by previous fiscal years' *E/A*. Means and growth rates of *E/A* are calculated within two groups with different sample period which are out-of-sample period from 2001 to 2013, and whole extended period from 1963 to 2013. We show the same things for Δ*A/A* as the proxy of investment.

Panel A. dividend decisions with EPSG

Payers with EPSG(1-3)					*Newpayers with EPSG(1-3)*				
	01-13		**63-13**			**01-13**		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**		**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.07		0.08		***E/A(-5)***	0.008		0.027	
E/A(-4)	0.058	-17.098	0.074	-7.886	***E/A(-4)***	0.008	2.723	0.018	-34.014
E/A(-3)	0.087	49.961	0.091	23.426	***E/A(-3)***	0.058	-819.936	0.063	247.644
E/A(-2)	0.101	16.560	0.101	10.981	***E/A(-2)***	0.09	56.686	0.087	38.486
E/A(-1)	0.112	10.347	0.109	7.927	***E/A(-1)***	0.112	24.305	0.108	23.947
E/A	0.099	-11.291	0.101	-7.666	***E/A***	0.104	-7.620	0.101	-6.490
E/A(+1)	0.09	-9.195	0.094	-6.566	***E/A(+1)***	0.086	-16.816	0.09	-11.252
E/A(+2)	0.076	-15.954	0.089	-5.568	***E/A(+2)***	0.041	-52.754	0.072	-19.624
E/A(+3)	0.078	3.452	0.086	-2.798	***E/A(+3)***	0.062	51.656	0.065	-10.457
E/A(+4)	0.076	-3.156	0.086	-0.544	***E/A(+4)***	0.052	-15.544	0.072	10.762
E/A(+5)	0.08	5.199	0.084	-1.968	***E/A(+5)***	0.052	0.528	0.066	-8.250
ΔA/A(-5)	0.091		0.066		***ΔA/A(-5)***	0.122		0.023	
ΔA/A(-4)	0.084	-7.927	0.06	-8.524	***ΔA/A(-4)***	0.078	-36.402	0.006	-74.823
ΔA/A(-3)	0.06	-28.910	0.082	36.804	***ΔA/A(-3)***	0.035	-55.214	0.028	-584.797
ΔA/A(-2)	0.033	-43.806	0.105	27.424	***ΔA/A(-2)***	0.042	20.556	0.079	180.636
ΔA/A(-1)	0.051	51.425	0.117	11.841	***ΔA/A(-1)***	0.001	-102.847	0.118	50.012
ΔA/A	0.074	46.138	0.102	-12.493	***ΔA/A***	0.066	-5605.149	0.105	-11.411
ΔA/A(+1)	0.06	-19.540	0.091	-11.252	***ΔA/A(+1)***	0.055	-16.408	0.112	6.428
ΔA/A(+2)	0.053	-10.748	0.079	-13.284	***ΔA/A(+2)***	0.027	-50.024	0.096	-13.644
ΔA/A(+3)	0.045	-16.299	0.069	-12.289	***ΔA/A(+3)***	0.001	-95.660	0.039	-59.596
ΔA/A(+4)	0.049	9.115	0.071	2.179	***ΔA/A(+4)***	0.05	4069.610	0.066	70.105
ΔA/A(+5)	0.042	-14.460	0.062	-12.347	***ΔA/A(+5)***	0.011	-78.289	0.054	-19.122

Table 4.18 (continue)

	Payers with EPSG(1,3)				*Newpayers with EPSG(1,3)*			
	01-13		**63-13**		**01-13**		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.071		0.08		0.037		0.043	
E/A(-4)	0.061	-14.978	0.074	-6.852	0.018	-51.631	0.036	-16.683
E/A(-3)	0.075	24.168	0.083	12.305	0.043	139.542	0.048	34.796
E/A(-2)	0.087	14.811	0.091	9.527	0.062	45.849	0.065	34.306
E/A(-1)	0.098	13.463	0.1	10.229	0.093	50.306	0.095	46.875
E/A	0.085	-13.350	0.091	-9.122	0.098	4.692	0.095	-0.690
E/A(+1)	0.077	-9.127	0.085	-7.225	0.074	-24.609	0.072	-24.287
E/A(+2)	0.068	-12.539	0.081	-4.149	0.033	-55.199	0.068	-5.122
E/A(+3)	0.067	-1.580	0.078	-3.522	0.044	33.803	0.062	-8.586
E/A(+4)	0.069	2.905	0.077	-2.081	0.054	22.794	0.058	-7.123
E/A(+5)	0.073	6.500	0.075	-1.695	0.062	15.273	0.06	2.999
ΔA/A(-5)	0.074		0.065		0.077		0.026	
ΔA/A(-4)	0.068	-7.454	0.065	0.228	0.047	-39.295	0.031	20.039
ΔA/A(-3)	0.051	-25.531	0.076	16.205	0.019	-58.475	0.032	3.297
ΔA/A(-2)	0.04	-22.253	0.089	17.315	0.034	73.813	0.044	36.782
ΔA/A(-1)	0.054	36.960	0.101	12.981	0.04	17.189	0.079	77.287
ΔA/A	0.056	3.827	0.088	-12.267	0.031	-22.076	0.07	-11.530
ΔA/A(+1)	0.048	-15.122	0.078	-11.802	0.051	65.345	0.086	23.539
ΔA/A(+2)	0.049	2.759	0.069	-11.020	0.041	-19.577	0.069	-19.219
ΔA/A(+3)	0.043	-12.686	0.061	-11.796	0.038	-7.528	0.057	-17.310
ΔA/A(+4)	0.043	-0.276	0.061	-0.661	0.005	-113.811	0.042	-26.411
ΔA/A(+5)	0.045	4.457	0.057	-5.709	0.001	-123.267	0.045	6.670

	Payers with EPSG(1-5)				*Newpayers with EPSG(1-5)*			
	01-13		**63-13**		**01-13**		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.088		0.091		0.027		0.055	
E/A(-4)	0.098	10.845	0.098	7.923	0.047	76.379	0.075	36.971
E/A(-3)	0.106	8.155	0.104	6.095	0.083	73.995	0.096	27.686
E/A(-2)	0.112	5.595	0.109	4.926	0.105	27.498	0.104	8.408
E/A(-1)	0.118	5.279	0.114	4.333	0.12	13.779	0.114	9.662
E/A	0.109	-7.896	0.108	-4.876	0.114	-5.052	0.108	-4.732
E/A(+1)	0.101	-7.410	0.103	-4.949	0.112	-1.400	0.106	-1.935
E/A(+2)	0.075	-25.550	0.098	-4.657	0.074	-33.729	0.086	-18.531
E/A(+3)	0.083	10.268	0.095	-2.825	0.09	20.900	0.063	-27.497
E/A(+4)	0.09	8.604	0.093	-2.377	0.084	-6.621	0.068	7.771
E/A(+5)	0.094	4.524	0.09	-3.688	0.112	33.269	0.087	28.671
ΔA/A(-5)	0.093		0.079		0.167		0.037	
ΔA/A(-4)	0.104	11.268	0.095	21.194	0.124	-25.896	0.094	150.140
ΔA/A(-3)	0.095	-8.542	0.111	16.237	0.077	-37.569	0.117	25.179
ΔA/A(-2)	0.083	-12.412	0.118	6.314	0.081	4.795	0.151	28.881
ΔA/A(-1)	0.066	-21.004	0.12	1.349	0.012	-115.050	0.176	16.747
ΔA/A	0.068	3.158	0.104	-13.064	0.031	-351.142	0.083	-53.070
ΔA/A(+1)	0.068	0.160	0.097	-7.073	0.104	238.828	0.115	38.533
ΔA/A(+2)	0.058	-14.384	0.084	-13.392	0.12	15.467	0.144	25.384
ΔA/A(+3)	0.052	-10.123	0.074	-11.235	0.06	-50.172	0.052	-63.963
ΔA/A(+4)	0.031	-39.922	0.061	-17.636	0.09	51.680	0.069	32.955
ΔA/A(+5)	0.049	55.119	0.063	2.530	0.066	-26.885	0.052	-24.231

Table 4.18 (continue)

	Payers with EPSG(1,5)			
	01-13		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.074		0.08	
E/A(-4)	0.077	4.222	0.084	5.016
E/A(-3)	0.082	6.545	0.088	4.923
E/A(-2)	0.09	8.927	0.093	5.871
E/A(-1)	0.1	11.478	0.101	8.355
E/A	0.087	-13.348	0.091	-9.376
E/A(+1)	0.077	-11.552	0.085	-7.210
E/A(+2)	0.064	-16.119	0.082	-3.858
E/A(+3)	0.067	4.236	0.079	-3.718
E/A(+4)	0.072	7.754	0.076	-2.681
E/A(+5)	0.074	3.119	0.074	-3.087
ΔA/A(-5)	0.075		0.074	
ΔA/A(-4)	0.071	-4.534	0.077	4.446
ΔA/A(-3)	0.06	-15.498	0.084	9.614
ΔA/A(-2)	0.056	-6.474	0.093	9.811
ΔA/A(-1)	0.058	3.320	0.098	6.375
ΔA/A	0.058	0.328	0.087	-12.078
ΔA/A(+1)	0.047	-19.482	0.075	-13.237
ΔA/A(+2)	0.048	2.339	0.067	-11.250
ΔA/A(+3)	0.051	6.317	0.064	-4.303
ΔA/A(+4)	0.042	-17.233	0.057	-10.216
ΔA/A(+5)	0.046	7.350	0.054	-5.461

	Newpayers with EPSG(1,5)			
	01-13		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.032		0.04	
E/A(-4)	0.035	8.911	0.045	12.824
E/A(-3)	0.053	49.818	0.054	20.245
E/A(-2)	0.059	12.242	0.064	19.781
E/A(-1)	0.093	56.112	0.096	48.679
E/A	0.097	4.337	0.095	-0.573
E/A(+1)	0.072	-25.769	0.073	-23.269
E/A(+2)	0.028	-60.527	0.069	-5.550
E/A(+3)	0.044	56.390	0.064	-7.063
E/A(+4)	0.06	36.020	0.058	-10.134
E/A(+5)	0.064	6.088	0.053	-8.588
ΔA/A(-5)	0.071		0.044	
ΔA/A(-4)	0.044	-38.371	0.044	1.892
ΔA/A(-3)	0.05	13.107	0.041	-7.238
ΔA/A(-2)	0.046	-7.101	0.045	8.452
ΔA/A(-1)	0.058	25.339	0.073	63.559
ΔA/A	0.023	-59.833	0.056	-22.875
ΔA/A(+1)	0.054	133.777	0.083	47.598
ΔA/A(+2)	0.043	-20.134	0.062	-25.308
ΔA/A(+3)	0.066	53.079	0.067	7.683
ΔA/A(+4)	0.009	-86.931	0.045	-33.426
ΔA/A(+5)	0.017	98.905	0.036	-18.687

	Divincrease with EPSG(1-3)			
	01-13		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.073		0.08	
E/A(-4)	0.06	-17.435	0.075	-7.350
E/A(-3)	0.089	48.254	0.091	22.481
E/A(-2)	0.103	16.256	0.101	11.037
E/A(-1)	0.113	9.887	0.11	8.197
E/A	0.103	-8.806	0.103	-5.890
E/A(+1)	0.094	-8.743	0.097	-6.047
E/A(+2)	0.078	-16.960	0.091	-6.014
E/A(+3)	0.08	1.621	0.088	-3.881
E/A(+4)	0.079	-0.920	0.087	-0.781
E/A(+5)	0.084	5.830	0.086	-1.261
ΔA/A(-5)	0.088		0.065	
ΔA/A(-4)	0.08	-8.515	0.059	-8.970
ΔA/A(-3)	0.061	-23.514	0.081	36.571
ΔA/A(-2)	0.036	-40.468	0.101	25.725
ΔA/A(-1)	0.051	40.103	0.116	14.055
ΔA/A	0.069	35.762	0.101	-12.773
ΔA/A(+1)	0.068	-1.251	0.095	-6.277
ΔA/A(+2)	0.051	-25.601	0.079	-16.081
ΔA/A(+3)	0.045	-11.549	0.07	-12.271
ΔA/A(+4)	0.053	17.365	0.071	1.983
ΔA/A(+5)	0.046	-13.096	0.063	-10.688

	Divcontinue with EPSG(1-3)			
	01-13		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.075		0.082	
E/A(-4)	0.062	-16.777	0.076	-7.442
E/A(-3)	0.089	42.682	0.092	21.115
E/A(-2)	0.102	14.865	0.101	10.167
E/A(-1)	0.112	9.543	0.109	7.331
E/A	0.099	-11.531	0.101	-7.716
E/A(+1)	0.09	-8.669	0.094	-6.368
E/A(+2)	0.077	-14.295	0.089	-5.047
E/A(+3)	0.079	2.158	0.087	-2.576
E/A(+4)	0.077	-2.587	0.086	-0.880
E/A(+5)	0.081	5.511	0.085	-1.796
ΔA/A(-5)	0.089		0.069	
ΔA/A(-4)	0.084	-5.392	0.063	-9.183
ΔA/A(-3)	0.061	-27.336	0.085	34.481
ΔA/A(-2)	0.033	-46.150	0.106	25.218
ΔA/A(-1)	0.054	63.613	0.117	10.609
ΔA/A	0.075	38.435	0.102	-12.540
ΔA/A(+1)	0.06	-19.709	0.09	-12.009
ΔA/A(+2)	0.055	-8.863	0.078	-13.251
ΔA/A(+3)	0.047	-13.913	0.07	-9.868
ΔA/A(+4)	0.049	3.217	0.071	0.618
ΔA/A(+5)	0.044	-10.236	0.062	-12.088

Table 4.18 (continue)

Divincrease with EPSG(1,3)					*Divcontinue with EPSG(1,3)*				
	01-13		**63-13**			**01-13**		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**		**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.075		0.081		***E/A(-5)***	0.074		0.081	
E/A(-4)	0.065	-13.032	0.076	-5.783	***E/A(-4)***	0.064	-13.611	0.076	-6.537
E/A(-3)	0.078	20.311	0.084	10.719	***E/A(-3)***	0.078	21.597	0.085	11.745
E/A(-2)	0.09	15.379	0.093	10.068	***E/A(-2)***	0.089	13.607	0.093	8.850
E/A(-1)	0.103	13.868	0.104	11.600	***E/A(-1)***	0.099	11.443	0.101	8.873
E/A	0.093	-9.521	0.097	-6.414	***E/A***	0.084	-14.794	0.091	-9.612
E/A(+1)	0.083	-10.197	0.089	-7.998	***E/A(+1)***	0.078	-7.695	0.085	-6.278
E/A(+2)	0.072	-13.911	0.085	-5.147	***E/A(+2)***	0.07	-10.218	0.082	-4.170
E/A(+3)	0.069	-3.242	0.082	-3.643	***E/A(+3)***	0.068	-2.672	0.079	-3.384
E/A(+4)	0.074	5.986	0.079	-2.625	***E/A(+4)***	0.069	2.267	0.078	-1.959
E/A(+5)	0.078	5.843	0.079	-0.949	***E/A(+5)***	0.074	6.177	0.076	-1.848
ΔA/A(-5)	0.078		0.068		***ΔA/A(-5)***	0.074		0.067	
ΔA/A(-4)	0.066	-15.993	0.068	-0.872	***ΔA/A(-4)***	0.07	-4.797	0.067	-0.132
ΔA/A(-3)	0.054	-18.408	0.075	10.174	***ΔA/A(-3)***	0.053	-24.048	0.078	16.571
ΔA/A(-2)	0.044	-18.099	0.086	15.603	***ΔA/A(-2)***	0.04	-24.920	0.092	17.019
ΔA/A(-1)	0.056	28.091	0.103	19.056	***ΔA/A(-1)***	0.055	38.532	0.102	11.340
ΔA/A	0.054	-3.911	0.09	-12.133	***ΔA/A***	0.058	4.699	0.089	-12.502
ΔA/A(+1)	0.05	-7.092	0.083	-8.081	***ΔA/A(+1)***	0.047	-18.040	0.077	-13.121
ΔA/A(+2)	0.051	0.746	0.072	-13.781	***ΔA/A(+2)***	0.049	4.143	0.069	-10.446
ΔA/A(+3)	0.048	-4.246	0.065	-9.486	***ΔA/A(+3)***	0.043	-12.941	0.061	-11.622
ΔA/A(+4)	0.044	-10.037	0.062	-3.753	***ΔA/A(+4)***	0.046	7.875	0.062	0.560
ΔA/A(+5)	0.046	5.323	0.058	-7.146	***ΔA/A(+5)***	0.048	4.141	0.058	-6.038

Divincrease with EPSG(1-5)					*Divcontinue with EPSG(1-5)*				
	01-13		**63-13**			**01-13**		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**		**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.091		0.092		***E/A(-5)***	0.091		0.092	
E/A(-4)	0.1	9.539	0.098	7.306	***E/A(-4)***	0.1	9.926	0.099	7.404
E/A(-3)	0.108	8.703	0.104	6.190	***E/A(-3)***	0.107	6.674	0.104	5.602
E/A(-2)	0.115	6.079	0.109	4.736	***E/A(-2)***	0.112	4.792	0.109	4.830
E/A(-1)	0.121	5.591	0.114	4.686	***E/A(-1)***	0.118	4.900	0.114	4.181
E/A	0.113	-6.693	0.11	-4.216	***E/A***	0.108	-8.034	0.108	-4.880
E/A(+1)	0.104	-8.592	0.104	-4.802	***E/A(+1)***	0.1	-7.674	0.103	-5.035
E/A(+2)	0.079	-23.491	0.1	-4.181	***E/A(+2)***	0.075	-25.150	0.098	-4.253
E/A(+3)	0.084	6.392	0.096	-4.203	***E/A(+3)***	0.082	9.900	0.096	-2.305
E/A(+4)	0.091	7.492	0.093	-2.374	***E/A(+4)***	0.09	9.195	0.094	-2.566
E/A(+5)	0.097	7.096	0.091	-2.493	***E/A(+5)***	0.093	3.350	0.09	-4.268
ΔA/A(-5)	0.088		0.077		***ΔA/A(-5)***	0.09		0.08	
ΔA/A(-4)	0.098	12.242	0.094	22.174	***ΔA/A(-4)***	0.103	14.562	0.096	19.382
ΔA/A(-3)	0.092	-6.240	0.107	14.189	***ΔA/A(-3)***	0.096	-6.878	0.111	15.974
ΔA/A(-2)	0.082	-10.626	0.113	5.141	***ΔA/A(-2)***	0.083	-13.073	0.117	5.597
ΔA/A(-1)	0.063	-23.141	0.118	4.845	***ΔA/A(-1)***	0.069	-16.647	0.118	0.751
ΔA/A	0.068	7.244	0.103	-13.261	***ΔA/A***	0.069	0.194	0.105	-11.265
ΔA/A(+1)	0.069	2.051	0.098	-4.325	***ΔA/A(+1)***	0.066	-4.669	0.096	-8.132
ΔA/A(+2)	0.055	-20.580	0.083	-15.612	***ΔA/A(+2)***	0.055	-16.755	0.082	-14.756
ΔA/A(+3)	0.062	11.816	0.075	-9.952	***ΔA/A(+3)***	0.052	-5.800	0.075	-8.602
ΔA/A(+4)	0.049	-20.868	0.064	-14.644	***ΔA/A(+4)***	0.028	-45.194	0.061	-18.601
ΔA/A(+5)	0.053	9.798	0.064	1.056	***ΔA/A(+5)***	0.048	67.659	0.063	3.423

Table 4.18 (continue)

Divincrease with EPSG(1,5)

	01-13		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.076		0.08	
E/A(-4)	0.078	1.839	0.084	3.841
E/A(-3)	0.083	7.372	0.088	5.664
E/A(-2)	0.091	9.643	0.094	6.827
E/A(-1)	0.103	12.867	0.104	10.410
E/A	0.094	-8.509	0.097	-6.441
E/A(+1)	0.084	-11.122	0.09	-7.518
E/A(+2)	0.069	-18.265	0.086	-4.916
E/A(+3)	0.07	2.455	0.082	-3.825
E/A(+4)	0.077	9.931	0.079	-3.607
E/A(+5)	0.079	1.998	0.078	-2.293
ΔA/A(-5)	0.077		0.074	
ΔA/A(-4)	0.068	-12.347	0.076	2.849
ΔA/A(-3)	0.061	-10.228	0.081	6.360
ΔA/A(-2)	0.055	-9.227	0.089	10.288
ΔA/A(-1)	0.062	12.777	0.101	12.478
ΔA/A	0.057	-7.461	0.088	-12.356
ΔA/A(+1)	0.053	-7.493	0.081	-8.137
ΔA/A(+2)	0.048	-9.758	0.069	-14.296
ΔA/A(+3)	0.054	12.826	0.066	-5.425
ΔA/A(+4)	0.042	-22.013	0.059	-9.977
ΔA/A(+5)	0.05	17.857	0.057	-4.276

Divcontinue with EPSG(1,5)

	01-13		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.077		0.082	
E/A(-4)	0.08	4.010	0.086	4.868
E/A(-3)	0.085	5.298	0.09	4.595
E/A(-2)	0.092	8.626	0.095	5.496
E/A(-1)	0.1	9.327	0.101	7.054
E/A	0.086	-14.642	0.091	-9.835
E/A(+1)	0.077	-10.401	0.085	-6.443
E/A(+2)	0.066	-13.895	0.082	-3.846
E/A(+3)	0.068	2.857	0.079	-3.657
E/A(+4)	0.073	6.753	0.077	-2.499
E/A(+5)	0.075	3.202	0.075	-2.919
ΔA/A(-5)	0.075		0.075	
ΔA/A(-4)	0.074	-2.048	0.078	4.557
ΔA/A(-3)	0.062	-16.100	0.087	10.712
ΔA/A(-2)	0.057	-7.283	0.095	9.341
ΔA/A(-1)	0.058	1.639	0.1	5.056
ΔA/A	0.061	4.595	0.088	-11.560
ΔA/A(+1)	0.046	-23.727	0.075	-15.292
ΔA/A(+2)	0.049	4.637	0.067	-10.392
ΔA/A(+3)	0.05	3.593	0.064	-4.888
ΔA/A(+4)	0.045	-10.917	0.058	-9.358
ΔA/A(+5)	0.048	6.049	0.055	-4.767

Panel B. dividend decisions with EPSD

Divomission with EPSD(1-3)

	01-13		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.084		0.091	
E/A(-4)	0.092	8.811	0.104	14.143
E/A(-3)	0.061	-33.538	0.076	-26.800
E/A(-2)	0.014	-76.533	0.04	-47.122
E/A(-1)	-0.09	-715.715	-0.04	-198.531
E/A	-0.04	-58.559	-0.01	79.779
E/A(+1)	-0	89.013	0.013	261.730
E/A(+2)	0.05	1352.252	0.041	215.818
E/A(+3)	0.046	-8.028	0.044	7.190
E/A(+4)	0.05	8.274	0.047	6.465
E/A(+5)	0.049	-2.929	0.05	8.270
ΔA/A(-5)	-0.21		0.095	
ΔA/A(-4)	0.003	101.405	0.125	31.657
ΔA/A(-3)	0.066	2129.417	0.111	-11.000
ΔA/A(-2)	0.065	-1.572	0.047	-58.160
ΔA/A(-1)	0.084	30.217	-0.09	-285.350
ΔA/A	-0.1	-215.472	-0.09	4.584
ΔA/A(+1)	-0.04	-63.294	-0.08	15.283
ΔA/A(+2)	0.031	186.279	-0.01	83.222
ΔA/A(+3)	0.084	172.496	0.045	452.858
ΔA/A(+4)	0.051	-39.300	0.013	-71.744
ΔA/A(+5)	0.044	-14.381	0.021	63.640

Divdecrease with EPSD(1-3)

	01-13		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.092		0.100	
E/A(-4)	0.111	20.631	0.112	11.832
E/A(-3)	0.078	-30.185	0.089	-20.642
E/A(-2)	0.040	-48.599	0.062	-30.388
E/A(-1)	0.044	-211.335	0.005	-91.483
E/A	0.007	-85.184	0.020	284.951
E/A(+1)	0.012	-277.111	0.035	72.653
E/A(+2)	0.040	243.044	0.048	37.234
E/A(+3)	0.045	12.033	0.052	8.833
E/A(+4)	0.045	0.229	0.052	-0.847
E/A(+5)	0.042	-5.567	0.058	11.227
ΔA/A(-5)	0.124		0.095	
ΔA/A(-4)	0.015	-112.222	0.122	29.447
ΔA/A(-3)	0.066	333.825	0.100	-18.620
ΔA/A(-2)	0.083	25.970	0.058	-41.412
ΔA/A(-1)	0.078	-5.787	0.031	-152.403
ΔA/A	0.067	-185.540	0.030	-2.845
ΔA/A(+1)	0.041	-38.647	0.029	-2.198
ΔA/A(+2)	0.028	-168.839	0.017	-159.625
ΔA/A(+3)	0.068	139.331	0.041	137.254
ΔA/A(+4)	0.016	-76.179	0.024	-41.625
ΔA/A(+5)	0.035	120.409	0.037	55.798

Table 4.18 (continue)

	Divomission with EPSD(1,3)					*Divdecrease with EPSD(1,3)*			
	01-13		**63-13**			**01-13**		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**		**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.068		0.076		***E/A(-5)***	0.082		0.09	
E/A(-4)	0.077	13.067	0.083	8.957	***E/A(-4)***	0.09	9.956	0.097	6.881
E/A(-3)	0.052	-32.508	0.067	-19.112	***E/A(-3)***	0.071	-21.773	0.085	-11.754
E/A(-2)	0.013	-75.041	0.044	-34.938	***E/A(-2)***	0.043	-38.645	0.071	-16.859
E/A(-1)	-0.06	-545.974	-0.02	-154.360	***E/A(-1)***	0.007	-115.562	0.036	-49.668
E/A	-0.03	50.493	-0	-88.092	***E/A***	0.003	-151.977	0.038	6.317
E/A(+1)	0.001	104.624	0.019	-782.623	***E/A(+1)***	0.022	536.594	0.051	33.733
E/A(+2)	0.048	3507.005	0.03	54.104	***E/A(+2)***	0.052	132.775	0.055	7.569
E/A(+3)	0.033	-30.770	0.034	14.168	***E/A(+3)***	0.048	-7.110	0.057	5.089
E/A(+4)	0.027	-19.120	0.039	15.210	***E/A(+4)***	0.043	-10.946	0.058	1.494
E/A(+5)	0.027	-0.045	0.042	8.586	***E/A(+5)***	0.041	-3.764	0.061	4.041
ΔA/A(-5)	-0.15		0.074		***ΔA/A(-5)***	0.084		0.085	
ΔA/A(-4)	-0.01	92.351	0.095	27.789	***ΔA/A(-4)***	0.014	-116.129	0.102	20.060
ΔA/A(-3)	0.062	623.644	0.093	-2.082	***ΔA/A(-3)***	0.063	360.230	0.094	-7.869
ΔA/A(-2)	0.075	20.684	0.05	-45.631	***ΔA/A(-2)***	0.079	25.895	0.07	-25.624
ΔA/A(-1)	0.067	-10.447	-0.07	-229.849	***ΔA/A(-1)***	0.065	-17.096	0.011	-84.652
ΔA/A	-0.11	-261.611	-0.1	45.478	***ΔA/A***	0.066	-200.456	0.004	-133.940
ΔA/A(+1)	-0.05	54.891	-0.06	35.987	***ΔA/A(+1)***	0.027	-58.647	0.007	-285.973
ΔA/A(+2)	0.003	105.386	-0.01	80.438	***ΔA/A(+2)***	0.02	-172.587	0.023	237.781
ΔA/A(+3)	0.029	999.137	0.033	373.578	***ΔA/A(+3)***	0.04	104.026	0.046	99.918
ΔA/A(+4)	0.035	20.348	0.027	-17.341	***ΔA/A(+4)***	0.041	2.976	0.043	-5.535
ΔA/A(+5)	0.018	-48.808	0.021	-23.460	***ΔA/A(+5)***	0.027	-33.891	0.042	-2.913

	Divomission with EPSD(1-5)					*Divdecrease with EPSD(1-5)*			
	01-13		**63-13**			**01-13**		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**		**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.083		0.096		***E/A(-5)***	0.093		0.108	
E/A(-4)	0.061	-26.648	0.079	-17.475	***E/A(-4)***	0.075	-20.053	0.096	-11.226
E/A(-3)	0.044	-28.047	0.063	-21.215	***E/A(-3)***	0.052	-30.468	0.078	-19.178
E/A(-2)	0.003	-93.352	0.029	-53.335	***E/A(-2)***	0.016	-69.697	0.049	-36.213
E/A(-1)	-0.15	-5373.355	-0.07	-344.711	***E/A(-1)***	0.082	-621.023	0.015	-130.542
E/A	-0.04	72.909	-0.01	79.448	***E/A***	0.063	-23.127	0.001	-90.693
E/A(+1)	0.013	130.395	0.009	164.088	***E/A(+1)***	0.019	-129.514	0.035	-2603.587
E/A(+2)	0.076	499.681	0.03	214.021	***E/A(+2)***	0.066	254.726	0.037	5.904
E/A(+3)	0.038	-50.344	0.042	42.148	***E/A(+3)***	0.065	-1.627	0.054	44.366
E/A(+4)	0.075	97.685	0.04	-4.753	***E/A(+4)***	0.066	1.089	0.051	-5.924
E/A(+5)	0.053	-29.416	0.06	50.377	***E/A(+5)***	0.021	-68.636	0.053	5.284
ΔA/A(-5)	-0.25		0.14		***ΔA/A(-5)***	0.132		0.131	
ΔA/A(-4)	-0.02	-91.812	0.083	-40.589	***ΔA/A(-4)***	0.022	-116.820	0.1	-23.516
ΔA/A(-3)	-0.01	-38.678	0.049	-41.161	***ΔA/A(-3)***	0.016	-25.567	0.063	-37.745
ΔA/A(-2)	0.013	208.712	0.024	-51.702	***ΔA/A(-2)***	0.043	161.413	0.042	-32.236
ΔA/A(-1)	0.138	928.628	-0.1	-506.168	***ΔA/A(-1)***	0.103	138.543	0.044	-204.509
ΔA/A	-0.12	-188.089	-0.08	16.987	***ΔA/A***	0.154	-249.730	0.062	39.637
ΔA/A(+1)	-0	95.953	-0.02	73.470	***ΔA/A(+1)***	0.029	-81.194	0.031	-49.842
ΔA/A(+2)	0.109	2308.922	0.055	360.675	***ΔA/A(+2)***	0.035	-220.859	0.022	-171.720
ΔA/A(+3)	0.102	-6.215	0.026	-51.890	***ΔA/A(+3)***	0.039	10.344	0.031	38.522
ΔA/A(+4)	0.003	-96.828	-0.01	-151.216	***ΔA/A(+4)***	0.008	-78.253	0.002	-106.973
ΔA/A(+5)	0.141	4256.303	-0.02	44.110	***ΔA/A(+5)***	0.075	798.779	0.022	-1131.477

Table 4.18 (continue)									
	Divomission with EPSD(1,5)					*Divdecrease with EPSD(1,5)*			
	01-13		**63-13**			**01-13**		**63-13**	
	Mean	**Grow rates %**	**Mean**	**Grow rates %**		**Mean**	**Grow rates %**	**Mean**	**Grow rates %**
E/A(-5)	0.065		0.075		***E/A(-5)***	0.079		0.09	
E/A(-4)	0.062	-4.947	0.072	-4.588	***E/A(-4)***	0.072	-9.090	0.085	-4.691
E/A(-3)	0.042	-32.226	0.06	-16.227	***E/A(-3)***	0.063	-11.744	0.079	-7.204
E/A(-2)	0.005	-86.871	0.039	-35.238	***E/A(-2)***	0.04	-37.233	0.067	-15.055
E/A(-1)	-0.06	-1151.142	-0.03	-171.740	***E/A(-1)***	0.007	-116.822	0.033	-51.665
E/A	-0.02	59.766	-0	-83.335	***E/A***	0.007	-198.061	0.036	11.165
E/A(+1)	0.008	133.225	0.017	-476.009	***E/A(+1)***	0.027	313.083	0.05	37.789
E/A(+2)	0.052	573.469	0.03	71.863	***E/A(+2)***	0.057	111.031	0.053	6.352
E/A(+3)	0.036	-29.672	0.033	10.183	***E/A(+3)***	0.05	-12.727	0.056	6.464
E/A(+4)	0.031	-14.651	0.04	22.511	***E/A(+4)***	0.044	-11.873	0.059	3.691
E/A(+5)	0.023	-24.572	0.045	9.982	***E/A(+5)***	0.039	-11.632	0.061	4.154
ΔA/A(-5)	-0.14		0.083		***ΔA/A(-5)***	0.079		0.09	
ΔA/A(-4)	-0.01	95.809	0.081	-1.900	***ΔA/A(-4)***	0.011	-113.387	0.084	-5.984
ΔA/A(-3)	0.045	846.673	0.078	-3.329	***ΔA/A(-3)***	0.049	358.772	0.081	-4.542
ΔA/A(-2)	0.059	32.939	0.04	-48.759	***ΔA/A(-2)***	0.057	17.560	0.06	-25.233
ΔA/A(-1)	0.063	6.947	-0.08	-301.263	***ΔA/A(-1)***	0.062	9.366	0.002	-97.173
ΔA/A	-0.12	-282.625	-0.11	-35.230	***ΔA/A***	0.066	-206.283	0.013	-860.616
ΔA/A(+1)	-0.05	56.875	-0.07	33.254	***ΔA/A(+1)***	0.022	-66.291	0.001	-93.642
ΔA/A(+2)	0.001	102.226	-0.02	70.190	***ΔA/A(+2)***	0.013	-160.316	0.018	-2286.072
ΔA/A(+3)	0.034	2994.445	0.031	243.735	***ΔA/A(+3)***	0.038	183.042	0.041	129.478
ΔA/A(+4)	0.041	19.838	0.028	-10.844	***ΔA/A(+4)***	0.039	3.272	0.043	4.202
ΔA/A(+5)	0.031	-25.130	0.024	-15.735	***ΔA/A(+5)***	0.039	-1.872	0.042	-2.533

Table 4.18 records means and growth rate of profitability (and asset growth) for firms who initiate/pay/increase/continue dividends after experiencing past earnings growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*), and means and growth rate of profitability (and asset growth) for firms who omit/decrease dividends after experiencing past earnings decline (*EPSD(1-3)*, *EPSD(1,3)*, *EPSD(1-5)*, and *EPSD(1,5)*). For firms who initiate/pay/increase/decrease dividends in fiscal year t, their profitability will decrease from next year t+1, and they will have declining profitability for the future five years. Although there are some exceptions that firms' future earnings performance may have 1-year or two-year increase in specific future years, these increases rarely seem to appear, and the overall increase of future profitability from current fiscal year t to the future fifth year is all negative. Meanwhile firms who pay/increase/continue dividends in the current fiscal year t also have similar decreasing asset growth rates in the future five years. Dividend initiators usually have increasing asset growth rate for the following one or two years, but their asset growth rate becomes negative again from the third year, and have overall negative asset growth rate over the next five years. This may indicate that dividend initiators have stronger expectations about firms' future performance than firms who pay/increase/continue dividends. This overreaction can last for one to two years, and then these initiators may find that firms' future performances are not as good as they expected, which causes firms' asset growth rates to revert to what they should be.

Firms' trends of future earnings performance and future asset growth rate are not the same in the whole sample period from 1963 to 2013 and the out-of-sample period from 2001 to 2013. Firms' decreasing future earnings performance and asset growth rates have fewer violations in the sample from 1963 to 2013 than those in the sample from 2001 to 2013. However, overall decreasing profitability and asset growth rates are both negative in the different sample periods. In summary, managers who observe past earnings growth and then decide to initiate/pay/increase/continue dividends are overreacting and wrongly extrapolate past earnings growth into the future. This conclusion holds in the out-of-sample period.

Panel B in Table 4.18 shows that firms who omit/decrease dividends after experiencing declining profitability over the previous three or five years are also overreacting to past earnings performance. These firms all show overall increasing profitability in the following five years. Especially for the next year *t*+1 of current fiscal year *t*, firms who omit/decrease dividends can usually revert negative profitability into positive in the whole sample period as well as in the out-of-sample period, and then the positive increasing profitability can last for years. Dividend omissioners/decreasers' future asset growth tends to smoothly grow in the future three years, which also indicates an overreaction of managers to firms' past earnings decline. Although these firms can experience a decrease in asset growth rate in the fourth year and/or the fifth year, the overall asset growth from the current fiscal year t to the future fifth year *t*+5 are all positive in both sample periods.

4.4 Further tests: issues of positive EPS and financial crisis

4.4.1 Positive EPS and negative EPS

When we are using firms' past growing EPS as the proxy for managerial overextrapolation, it is unavoidably to discussion the issue of negative EPS. For some payout decisions like dividend initiating/increasing decisions, it is reasonable to assume that managers may make these dividend paying decisions when they are foreseeing future growth in EPS, because managers may tend to use dividend as the signal to convey investors that their firms are going to perform excellently in the future, even though the current EPS are still negative. However, dividend decreasing/omitting decisions may only be caused by changes from positive earnings to negative earnings rather than managerial overextrapolation based on past decline in EPS. Therefore it is crucial to have robustness check on whether our indicators of managerial overextrapolation can still have impact on firms' dividend decisions especially for dividend decreasing/omitting decisions, after replacing our previous indicators with new ones formed by only using positive EPS. Results of second-stage regressions for PTI, PTIN, ΔPTP, PTD and PTO by using new indicators of managerial overextrapolation are shown in Table 4.19.

Table 4.19 shows that nearly all our EPSG/EPSD indicators representing for managerial overextrapolation still have significant positive impact on firms' propensity to make different dividend decisions cross the whole time period from 1963 to 2013 in this thesis, when only positive EPS are used. We also test the new-formed EPSG/EPSD indicators in the in-sample period from 1963 to 2000 (not shown in this thesis) and find similar results, so we conclude that using positive EPS only will not affect our previous conclusions based on previous indicators of managerial overextrapolations.

Table 4.19 Propensity to initiate, to increase, to pay, to omit, and to decrease dividend, and patterns of earnings growth or declines over the past three or five years formed by using positive EPS only, 1963-2013

This table reports coefficient estimates from the second-stage regression of firms' dividend decisions on dividend premium ($PD{-}ND$), and new indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*) formed by using positive EPS only. The dependent variables (*PTI, PTIN,* Δ*PTP, PTO* and *PTD*) are the residuals from the first stage Fama-Macbeth logistic regression of dividend decisions on firm characteristics (*NYP,* Δ*A/A, M/B*, and *E/A*) and risks, and results are in Panels A, B, C, D and E respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. Dependent variable: PTI					
VW P^{D-ND}	***EPSG(1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***Risks controlled***
0.23*** (12.98)	0.01 (0.60)				No
0.22*** (13.67)		0.02*** (5.39)			No
0.22*** (14.89)			1.81E-3(0.38)		No
0.18*** (16.61)				0.01*** (5.39)	No
0.25*** (14.17)	3.73E-3(0.36)				Yes
0.24*** (14.69)		0.02*** (4.25)			Yes
0.24*** (16.15)			5.26E-4 (0.11)		Yes
0.20*** (17.87)				0.01*** (4.53)	Yes
Panel B. Dependent variable: PTIN					
VW P^{D-ND}	***EPSG(1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***Risks controlled***
0.25*** (12.36)	0.07*** (6.71)				No
0.24*** (12.33)		0.08*** (16.14)			No
0.23*** (12.50)			0.08*** (13.18)		No
0.22*** (12.41)				0.11*** (22.64)	No
0.28*** (13.84)	0.07*** (6.42)				Yes
0.27*** (13.93)		0.08*** (16.22)			Yes
0.25*** (13.79)			0.08*** (12.92)		Yes
0.24*** (13.81)				0.11*** (22.67)	Yes
Panel C. Dependent variable: ΔPTP					
VW P^{D-ND}	***EPSG(1-5)***	***EPSG(1,5)***	***EPSG(1-3)***	***EPSG(1,3)***	***Risks controlled***
0.05*** (6.67)	0.03*** (7.09)				No
0.04*** (5.00)		0.08*** (41.04)			No
0.04*** (6.02)			0.04*** (17.35)		No
0.03*** (4.33)				0.08*** (47.76)	No
-0.04*** (-3.90)	0.03*** (5.73)				Yes
-0.04*** (-4.66)		0.06*** (23.95)			Yes
-0.05*** (-5.62)			0.04*** (12.65)		Yes
-0.06*** (-7.54)				0.06*** (29.08)	Yes

Table 4.19 (continue)					
Panel D. Dependent variable: PTO					
VW P^{D-ND}	***EPSD (1-5)***	***EPSD(1,5)***	***EPSD(1-3)***	***EPSD(1,3)***	***Risks controlled***
4.81E-3 (0.85)	0.07*** (6.31)				No
0.01* (1.73)		2.66E-3 (1.30)			No
0.01 (1.55)			0.04*** (14.05)		No
0.02** (2.50)				0.01*** (3.10)	No
-4.68 (-0.83)	0.06*** (5.89)				Yes
-0.01 (-1.30)		0.01*** (3.18)			Yes
-4.04E-4 (-0.08)			0.04*** (11.53)		Yes
-3.79E-3 (-0.55)				0.01*** (4.15)	Yes
Panel E. Dependent variable: PTD					
VW P^{D-ND}	***EPSD (1-5)***	***EPSD(1,5)***	***EPSD(1-3)***	***EPSD(1,3)***	***Risks controlled***
-0.11*** (-6.64)	0.16*** (4.86)				No
-0.14*** (-8.17)		0.02*** (4.98)			No
-0.10*** (-6.35)			0.18*** (8.40)		No
-0.12*** (-7.63)				0.03*** (8.21)	No
-0.14*** (-8.12)	0.15*** (4.58)				Yes
-0.17*** (-10.55)		0.01** (2.32)			Yes
-0.12*** (-8.00)			0.07*** (7.77)		Yes
-0.14*** (-9.45)				0.02*** (5.31)	Yes

4.4.2 The impact of financial crisis

Recent literature (see Campello et al., 2009; Houser, 2013; Floyd and Skinner, 2014) have documented changes in firms' dividend policy during the 2007-2008 financial crisis. We use Kuo et al. (2013)'s method in testing the financial crisis or recession in the second-stage regression of the Fama-Macbeth logistic regression. By bringing in the dummies representing recession or financial crisis, we can test the potential impact of financial crisis on firms' propensity to make dividend decisions, and can also test whether our previous results for indicators of managerial overextrapolation are robust.

Table 4.20 Propensity to initiate, to increase, to pay, to omit, and to decrease dividend, and patterns of earnings growth or declines over the past three or five years after controlling for recession, 1963-2013

This table reports coefficient estimates from the second-stage regression of firms' dividend decisions on dividend premium ($PD{-}ND$), recession, and new indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3), EPSG(1,3), EPSG(1-5),* and *EPSG(1,5)*) formed by using positive EPS only. The dependent variables (*PTI, PTIN,* Δ*PTP, PTO* and *PTD*) are the residuals from the first stage Fama-Macbeth logistic regression of dividend decisions on firm characteristics (*NYP*, Δ*A/A, M/B*, and *E/A*) and risks, and results are in Panels A, B, C, D and E respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. Dependent variable: PTI

VW P^{D-ND}	EPSG(1-5)	EPSG(1,5)	EPSG(1-3)	EPSG(1,3)	Recession	Risks controlled
0.24*** (13.23)	0.01 (0.77)				-0.02*** (-3.61)	No
0.22*** (13.94)		0.02*** (5.62)			-0.02*** (-3.99)	No
0.22*** (15.12)			2.88E-3(0.61)		-0.02*** (-4.58)	No
0.18*** (16.88)				0.01*** (5.46)	-0.02*** (-4.33)	No
0.25*** (14.23)	4.38E-3(0.43)				-0.01 (-1.32)	Yes
0.25*** (14.77)		0.02*** (4.34)			-0.01 (-1.58)	Yes
0.24*** (16.22)			0.97E-4 (0.20)		-0.01* (-1.89)	Yes
0.20*** (17.91)				0.01*** (4.55)	-4.52E-3 (-1.21)	Yes

Panel B. Dependent variable: PTIN

VW P^{D-ND}	EPSG(1-5)	EPSG(1,5)	EPSG(1-3)	EPSG(1,3)	Recession	Risks controlled
0.25*** (12.41)	0.07*** (6.53)				0.02*** (2.55)	No
0.24*** (12.63)		0.08*** (15.96)			0.01 (1.30)	No
0.23*** (12.56)			0.08*** (13.03)		0.01* (1.69)	No
0.22*** (12.45)				0.11*** (22.55)	0.01 (1.55)	No
0.28*** (13.98)	0.07*** (5.96)				0.05*** (6.86)	Yes
0.28*** (14.07)		0.08*** (15.66)			0.04*** (5.72)	Yes
0.25*** (14.03)			0.08*** (12.45)		0.04*** (6.38)	Yes
0.25*** (14.01)				0.11*** (22.36)	0.04*** (6.44)	Yes

Panel C. Dependent variable: ∆PTP

VW P^{D-ND}	EPSG(1-5)	EPSG(1,5)	EPSG(1-3)	EPSG(1,3)	Recession	Risks controlled
0.05*** (6.68)	0.03*** (7.30)				-0.01*** (-3.53)	No
0.04*** (5.01)		0.08*** (41.19)			-0.01*** (-3.49)	No
0.04*** (5.97)			0.04*** (17.58)		-0.01*** (-4.18)	No
0.03*** (4.34)				0.08*** (47.79)	-4.63E-3* (-1.86)	No
-0.04*** (-4.01)	0.02*** (4.39)				0.07*** (21.26)	Yes
-0.04*** (-4.76)		0.05*** (22.26)			0.07*** (21.47)	Yes
-0.05*** (-5.38)			0.03*** (11.24)		0.07*** (22.41)	Yes
-0.06*** (-7.79)				0.06*** (28.53)	0.07*** (25.27)	Yes

Table 4.20 (continue)						
Panel D. Dependent variable: PTO						
VW P^{D-ND}	***EPSD(1-5)***	***EPSD(1,5)***	***EPSD(1-3)***	***EPSD(1,3)***	***Recession***	***Risks controlled***
4.93E-3 (0.88)	0.07*** (6.32)				-2.04E-3 (-1.01)	No
0.01* (1.71)		2.55E-3 (1.24)			-2.04E-3 (-0.73)	No
0.01 (1.57)			0.04*** (14.05)		-6.55E-4 (-0.34)	No
0.02** (2.42)				0.01*** (3.01)	-0.01** (-2.22)	No
-0.01 (-0.94)	0.06*** (5.82)				-0.01*** (-4.64)	Yes
-0.01 (-1.46)		4.96E-3*** (2.61)			-0.01*** (-7.65)	Yes
-1.38E-3 (-0.26)			0.04*** (11.41)		-0.01*** (-5.03)	Yes
-0.01 (-0.90)				0.01*** (3.78)	-0.02*** (-9.54)	Yes
Panel E. Dependent variable: PTD						
VW P^{D-ND}	***EPSD(1-5)***	***EPSD(1,5)***	***EPSD(1-3)***	***EPSD(1,3)***	***Recession***	***Risks controlled***
-0.11*** (-6.68)	0.16*** (4.83)				-0.01** (-2.16)	No
-0.13*** (-8.15)		0.02*** (5.03)			0.01 (0.88)	No
-0.10*** (-6.43)			0.07*** (8.34)		-0.01** (-2.24)	No
-0.12*** (-7.58)				0.03*** (8.25)	0.01 (1.16)	No
-0.15*** (-8.92)	0.14*** (4.46)				-0.05*** (-8.36)	Yes
-0.17*** (-10.68)		0.01* (1.84)			-0.04*** (-6.50)	Yes
-0.12*** (-8.33)			0.07*** (7.55)		-0.05*** (-8.88)	Yes
-0.15*** (-9.70)				0.02*** (5.04)	-0.04*** (-6.75)	Yes

Table 4.21 Propensity to initiate, to increase, to pay, to omit, and to decrease dividend, and patterns of earnings growth or declines over the past three or five years after controlling for financial crisis, 1963-2013

This table reports coefficient estimates from the second-stage regression of firms' dividend decisions on dividend premium ($PD{-}ND$), dummy of financial crisis, and new indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*) formed by using positive EPS only. The dependent variables (*PTI, PTIN, ∆PTP, PTO* and *PTD*) are the residuals from the first stage Fama-Macbeth logistic regression of dividend decisions on firm characteristics (*NYP, ∆A/A, M/B*, and *E/A*) and risks, and results are in Panels A, B, C, D and E respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. Dependent variable: PTI

VW P^{D-ND}	EPSG(1-5)	EPSG(1,5)	EPSG(1-3)	EPSG(1,3)	FC	Risks controlled
0.24*** (12.95)	0.01 (0.59)				-0.01 (-1.42)	No
0.22*** (13.69)		0.02*** (5.37)			-0.01* (-1.71)	No
0.23*** (14.89)			1.89E-3(0.40)		-0.01 (-1.57)	No
0.19*** (16.77)				0.01*** (5.43)	-0.01** (-2.45)	No
0.26*** (13.92)	3.68E-3(0.36)				-3.22E-3 (-0.25)	Yes
0.25*** (14.49)		0.02*** (4.24)			-4.13E-3 (-0.90)	Yes
0.24*** (15.89)			5.48E-4 (0.12)		-2.01E-3 (-0.47)	Yes
0.20*** (17.84)				0.01*** (4.55)	-4.52E-3 (-1.52)	Yes

Panel B. Dependent variable: PTIN

VW P^{D-ND}	EPSG(1-5)	EPSG(1,5)	EPSG(1-3)	EPSG(1,3)	FC	Risks controlled
0.24*** (11.33)	0.07*** (6.77)				0.02** (2.30)	No
0.23*** (11.20)		0.08*** (16.22)			0.02** (2.67)	No
0.21*** (11.25)			0.08*** (13.20)		0.03*** (3.89)	No
0.21*** (12.44)				0.11*** (22.57)	0.02*** (2.95)	No
0.25*** (12.26)	0.07*** (6.53)				0.03*** (4.20)	Yes
0.25*** (12.24)		0.08*** (16.38)			0.03*** (4.60)	Yes
0.22*** (11.94)			0.08*** (12.96)		0.04*** (6.32)	Yes
0.22*** (12.25)				0.11*** (22.54)	0.03*** (5.41)	Yes

Panel C. Dependent variable: ∆PTP

VW P^{D-ND}	EPSG(1-5)	EPSG(1,5)	EPSG(1-3)	EPSG(1,3)	FC	Risks controlled
0.06*** (7.46)	0.03*** (7.00)				-0.01*** (4.04)	No
0.05*** (5.53)		0.08*** (40.94)			-0.01*** (2.77)	No
0.05*** (6.79)			0.04*** (17.34)		-0.01*** (4.15)	No
0.04*** (4.90)				0.08*** (47.83)	-0.01*** (3.27)	No
-0.10*** (-10.36)	0.03*** (6.36)				0.08*** (26.30)	Yes
-0.11*** (-11.28)		0.06*** (24.87)			0.08*** (27.08)	Yes
-0.10*** (-11.81)			0.04*** (12.84)		0.08*** (28.59)	Yes
-0.11*** (-13.51)				0.06*** (28.45)	0.08*** (29.88)	Yes

Table 4.21 (continue)

Panel D. Dependent variable: PTO

VW $\boldsymbol{P^{D-ND}}$	***EPSD(1-5)***	***EPSD(1,5)***	***EPSD(1-3)***	***EPSD(1,3)***	***FC***	***Risks controlled***
0.01 （1.01）	0.07*** (6.30)				-1.46E-3 (-0.72)	No
0.02*** (2.90)		3.11E-3 (1.52)			-0.01*** (-4.76)	No
0.01* (1.82)			0.04*** (14.01)		-2.55E-3 (-1.31)	No
0.03*** (3.46)				0.01*** (3.09)	-0.01*** (-4.54)	No
2.10E-4 (0.04)	0.06*** (5.85)				-0.01*** (-3.26)	Yes
0.01 (0.85)		0.01*** (3.56)			-0.02*** (-8.19)	Yes
0.01 （1.01）			0.04*** (11.42)		-0.01*** (-4.68)	Yes
0.01 （1.31）				0.01*** (4.13)	-0.02*** (-8.22)	Yes

Panel E. Dependent variable: PTD

VW $\boldsymbol{P^{D-ND}}$	***EPSD(1-5)***	***EPSD(1,5)***	***EPSD(1-3)***	***EPSD(1,3)***	***FC***	***Risks controlled***
-0.09*** (-5.04)	0.15*** (4.79)				-0.03*** (-5.33)	No
-0.11*** (-6.52)		0.02*** (5.22)			-0.03*** (-5.37)	No
-0.07*** (-4.74)			0.07*** (8.25)		-0.03*** (-6.21)	No
-0.09*** (-6.05)				0.03*** (8.19)	-0.03*** (-6.15)	No
-0.11*** (-6.37)	0.14*** (4.47)				-0.05*** (-7.98)	Yes
-0.13*** (-7.13)		0.01*** (2.73)			-0.05*** (-8.83)	Yes
-0.08*** (-5.53)			0.07*** (7.53)		-0.05*** (-9.77)	Yes
-0.10*** (-6.83)				0.02*** (5.28)	-0.06*** (-10.61)	Yes

Table 4.20 and Table 4.21 separately record results of the second-stage regressions by adding recession dummy and financial crisis dummy. In Table 4.20 and Table 4.21 we test recession and financial crisis by following Section 4.4.1's setting that only positive EPS is used to for indicators of managerial overextrapolation. We also test recession and financial crisis by using previous indicators of managerial overextrapolation formed by using both positive and negative EPS, and find that the significant impact of managerial overextrapolation is not affected.

Compared with dummies for recession, dummies for financial crisis have slightly more stable directions and significance, especially for results of *PTD*. We find inconsistence between results before and after controlling for risks, especially for results of ΔPTP. Considering the fact that risks as fundamental determinants of dividends play an essential role in models when behavioural factors are included, we only pay attention to results after controlling risks. We find that recession or financial crisis have significant effect on firms' dividend decisions except firms' propensity to initiate dividends.

Interestingly, our findings for financial crisis are inconsistent to Hauser (2013) and Floyd and Skinner (2014)'s findings that firms tend to reduce dividends during financial crisis. Table 4.20 and Table 4.21 show that firms' propensity to increase dividends increase during recession or financial crisis, but firms' propensity to omit/decrease dividends decrease during recession time or financial crisis. These differences between these findings and previous literature' findings may be caused by the difference in methodology used. We are analysing the potential impact of financial crisis on firms' propensity to make dividend decisions after ruling out fundamental determinants, while relevant previous literature directly analyse firms' dividend decisions during the financial crisis. We suggest that our method is reasonable, because we control for fundamental factors, before we go to the discussion of financial crisis' influence on firms' dividend policy. Our findings support the signal theory that managers may try to convert information of their positive believe in firms’ future performance to investors under the recession/financial crisis.

4.5. Conclusion

In this paper we test the hypothesis that a firm’s dividend payout decision is affected by its past long-term earnings performance in an extended sample of U.S. firms from 1963 to 2013, and an out-of-sample period from 2001 to 2013. We find that firms’ past ESP’s performance affects firms’ dividend decisions in the sample from

1963-2013 and out-of-sample from 2001-2013. Managers' overbelieves on the representativeness of previous stream of profitability make managers tend to extrapolate past earnings performance into the future. In addition, we find that proxies for managerial over-optimism/over-pessimism with catering factor (Baker and Wurgler, 2004a) jointly explains firms' dividend decisions including initiating/continuing/increasing/paying/omitting/decreasing dividends, given other conventional determinants such as size, current profitability, investment opportunity and risk factors (Hoberg and Prabhala, 2009).

As a further test on whether managers' extrapolation activities are representing managerial overoptimism/overpessimism, we list annual average growth rates of firms' future profitability for the following five years. In the out-of-sample data set from 2001 to 2013, we find that firms who choose to initiate/continue/increase/pay dividends after experiencing past profitability growth tend to have negative growth rates of profitability for the next two years, and positive growth rates of profitability for the future fourth and fifth years. On the other hand, firms who choose to omit/decrease dividends after experiencing previously decreasing profitability tend to have positive growth rates of profitability for the next two years and negative growth rates of profitability for the future fourth and fifth years. However, the general growth rates of profitability from the current fiscal year to the end of the future fifth year are negative for firms who initiate/continue/increase/pay dividends and are positive for firms who omit/decrease dividends. Combined with findings from the whole sample of 1963-2013, the same conclusion can be drawn that managers who extrapolate past growing/decreasing earnings into the future are overoptimistic/overpessimistic as is shown in Chapter 3.

Our main findings in this chapter support the findings and conclusions in Chapter 3. In the extended sample from 1963 to 2013 and out-of-sample from 2001 to 2013, managers' forecast on firms' future earnings performances are significantly affected by previously growing/decreasing EPS, and then they make dividend decisions based on their over-optimism/over-pessimism. The findings in this Chapter support the hypothesis that the disappearance of dividends from 1978 and the reappearance of dividends from 2002 are significantly affected by managerial overextrapolation, and are inconsistent with some previous literature that claim decreasing dividends during financial crisis On the opposite, we find impirical evidence that firms tend to increase dividends and not to omit/decrease dividends during the recession or financial crisis time after controlling for other determinants of dividend decisions.

CHAPTER 5 MANAGERIAL OVERCONFIDENCE VS MANAGERIAL OVEREXTRAPOLATION

5.1. Introduction

Chapter 3 and Chapter 4 have provided empirical evidence that managers who extrapolate past earnings growth into the future tend to overreact to these increases and then make dividend decisions based on their overextrapolation activities. Managers who believe that firms will have continuing increasing earnings in the future after past earnings growth tend to initiate/continue/increase/pay dividends, while managers who believe that firms will have continuing decreasing earnings in the future after past declines in earnings tend to omit/decrease dividends. In a further test of firms' future performance after managers make their dividend decisions, we find that managers overreact to past earnings performance and make improper dividend decisions. In detail, firms that initiate/continue/increase/pay dividends after experiencing positive EPS growth tend to have negative EPS growth in the future five years, and firms who omit/decrease dividends based on past decreasing EPS tend to have positive EPS growth in the future five years.

However, there are still two questions left un-answered: (1) Is Earnings per share a good proxy for firms' earnings performance which is directly connected with cash flow that can be used to pay dividends? (2) Can the findings of Chapter 3 and Chapter 4 about managerial extrapolation hold when other forms of managerial behaviour bias are considered? To answer these questions, we test the robustness of our EPS-related indicators proxy for managerial extrapolation by using two main methods. The first method is that we replace EPS with other items which can perform the same function to earnings that have direct relation with cash flow which can be used to pay dividends. The second method is that we jointly test our managerial extrapolation indicators with proxy for other forms of managerial behaviour bias in the same regressions.

Considering the fact that we only use EPS to represent firms' earnings performance in Chapter 3 and Chapter 4, there may be a problem of robustness in using this proxy. Since cash flow which is directly related to distribution is different from net incomes, EPS as the proxy can be contaminated by other accounting factors like depreciation and capital expenditure. To answer the first question of testing the robustness of EPS as the proxy for earnings performance in regression models, we apply the method of Lakonishok, Shleifer, and Vishny (1994) in evaluating firms' performance by using *sales,* which is a wider measurement of these available funds as proxy for firms' performance, and use free cash flow (*FCF*), which is is a narrowed measurement of available funds to distribute and is based on the calculation of Kulchania (2013), as another alternative of firms' performance. Between these two measurements, *FCF* is directly related to money which can be used to distribute profits to investors, and *sales* is the main stream of earnings for most firms. We find empirical evidence that EPS as the proxy for firms' earnings performance is as good as other proxies, and EPS-related indicators as proxies for managerial extrapolation have significant effect on firms' dividend decisions when other managerial behaviour factors are controlled.

The argument about managerial (over)extrapolation is based on the assumption that managers have behaviour bias in making decisions. Managerial behaviour bias has several forms, and most previous literature focuses on two forms of them: overconfidence and overextrapolation. Several recent papers raise the idea that overextrapolation and overconfidence are two different types of explanations for varying financial phenomenon caused by behavioural biases. DellaVigna (2009) summarizes previous literature on behavioural economics, and concludes that overconfidence and overextrapolation are two forms of "nonstandard beliefs". In his summary, DellaVigna (2009) states that overconfidence is about overestimation in "ability" and "precision" while overextrapolation is the "law of small numbers". Barberis (2011) proposes three possible explanations for the information bubble: (1) disagreement among investors on firms' future prospects under short-sale constraints; (2) investors' "bad models" based on past outcomes (extrapolation); (3) investors' overestimation on the precision of soft information[19] when gathering and analysing with fundamental issues. Barberis (2011) suggests that the recent financial crisis from 2007 can at least partly be attribute to investors' overextrapolation from past to the future (e.g. the real estate's price) and ignore risks.

As has been pointed out at the beginning of Chapter 2's section 2.3.3, one of distinguishable characteristics to define managerial overextrapolation from managerial overconfidence is that in most previous literature about managerial overconfidence, managerial overconfidence is linked to managers' own feeling about themselves in terms of their contribution to managing their firms or ability in managing firms (overconfidence of self-contribution or better-than-average). On the other hand, overextrapolation is purely the expectation of managers on firms' future performance based on observed information. It is hardly to claim that managers' expectation on firms future performance are not partly caused by their own feeling about their abilities or contribution, but we could define the left part of this expectation on future performance as extrapolation, if we could rule out

[19] See Petersen (2004) for a literature review and discussion on the definition of hard and soft information.

overconfidence part away from causes of this expectation. Technically, if we jointly test managerial overconfidence and managerial overextrapolation in the same regression model, we could test the part of expectation as the pure overextrapolation or the expectation based on overextrapolation after controlling for overconfidence.

In Chapter 2 Section 2.3.3.2, we discussed the paper by Alti and Tellock (2014) which distinguishes between agents' overconfidence and overextrapolation. Alti and Tellock (2014) define overconfidence as the overestimation on precision of soft information and overextrapolation as the overestimation on persistence of non-soft information[20]. Alti and Tellock (2014) argue that overconfident agents may overbelieve the precision of soft information and overextrapolated agents may overbelieve the persistence of hard information, and they find that overconfident managers overreact to profit signals, while overextrapolating managers underreact to profit signals. Therefore, overconfidence and overextrapolation can both come from the same source of information, but have opposite representations. If two explanatory variables are calculated based on the same information, there may be the problem of multi-collinearity in regressions using ordinary square technique. In addition, as La porta (1996) points out, extrapolation is not the whole story of a certain financial phenomena, so all other possible explanations should be considered and discussed. We jointly test three alternative proxies for managerial overconfidence and our indicators of managerial extrapolation in the same regression, and we find that managerial extrapolation has robust and consistent impact on managers' payout decisions given other factors including managerial overconfidence.

[20] soft information is defined as information that is usually text form and can hardly be measured, while hard information is defined as information that usually can be observed as numbers or can easily be measured by numbers (see Petersen, 2004)

The reason why we try different proxies of managerial overconfidence in regressions is that overconfidence has varied types, and different indicators can proxy for any one type or several types of overconfidence among these types. In the psychology literature, overconfidence includes overestimation, overplacement (e.g. better-than-average) and overprecision (e.g. underestimation on volatility of outcome). Overestimation is the phenomenon that individuals may overestimate their own abilities; overplacement is overestimation of ones' ability compared with other one's; overprecision is an overestimation about the accuracy of one's belief (see Moore and Healy, 2008). Among them, overestimation and overplacement both mention self-assessment, while overprecision is overestimation about precision of information (Oskamp, 1965). Most previous literature on managers' overconfidence does not clearly classify the category of overconfidence investigated.

The argument of Malmendier and Tate (2005) about overconfidence is based on overplacement (better-than-average), but their proxy for managerial overconfidence is general: they define CEOs who exercise options later than benchmark, or hold options to the expiration as overconfident CEOs. Detailed reasons why managers would like to hold options are hardly ever discussed further, so we do not know whether it is managers' thought about 'better-than-average', or managers' overestimation on their own ability, or managers' views about the precision of information they have that finally causes their overconfidence. In previous literature, for example Malmendier and Tate (2005), Campbell et al. (2011), and Hirshleifer et al. (2012), option-holding based measurements of CEOs' overconfidence are general measurements of overconfidence, while in Ben-David et al. (2013) measurement of managers' overconfidence belongs to the category of 'overprecision' of overconfidence. We use three alternative measurements to be proxies for managerial overconfidence. The first measurement of overconfidence was launched by Malmendier and Tate (2005) who use holding activities of vested but unexercised options to be proxy for managers' overconfidence. This option-holding based proxy for overconfidence is extended by Campbell et al. (2011) and is applied by Hirshleifer et al. (2012) and Ahmed and Duellman (2013) in a larger data set with more observations. The second measurement of managerial overconfidence is investment level which is connected with managers' optimism about firms' future project returns (Malmendier and Tate, 2005; Campbell et al, 2011). Since Malmendier and Tate (2005) conclude that firms' investment level is theoretically and empirically related to CEO's optimism, Campbell et al. (2011) argue that firms' investment level contains information about CEO's confidence. The third measurement of managerial overconfidence is CEO's activities in increasing holding equity on their own firms. This activity is defined as *net buyer* by Malmendier and Tate (2005) and then applied by Campbell et al. (2011). As these three alternative proxies for managerial overconfidence may represent different types of overconfidence or combination of varied types of overconfidence (e.g. the option-holding activity and *net buyer* activity can be proxy for managerial overprecision where managers underestimate the volatility of future market value for their firms; sharp increase in investment level can be proxy for managerial overestimation and overplacement where managers overestimate their ability in managing firms' profitability projects), we can test all main types of overconfidence in the regressions with our managerial extrapolation indicators. In addition to the argument that different causes of managerial overconfidence can lead to varied dividend decisions, Ben-David et al. (2007) argue that managers who are overperceiving future investment requirement may reduce dividends, while Wu and

Liu (2011) argue that managers who overestimate future cash flow from current investment may lead to increases in dividends. Consistent with the above arguments, we find mixed results for varied proxy of managerial overconfidence, while our indicators of managerial extrapolation keep showing significant positive effects on dividend decisions.

To address the two research questions in Section 5.1 on the robustness of EPS in representing firms' dividend-related earnings performance and the robustness of our managerial extrapolation given other managerial overoptimism factors, we ask four detailed research questions in this chapter:

(a) Does a firm's past earnings growth proxy by increase in *sales*, or *FCF*, affect the firm's propensity to initiate/continue/increase/pay dividends?

(b) Does a firm's past earnings decline proxy by decrease in *sales*, or *FCF*, affect the firm's propensity to omit/decrease dividends?

(c) Can our indicators of past growing earnings still have significant impact on firms' propensity to initiate/continue/increase/pay dividends after controlling for high and low optimism derived from *option-holding activity*, *investment ratio*, or *net buyer*?

(d) Can our indicators of past declining earnings still have significant impact on firms' propensity to initiate/continue/increase/pay dividends after controlling for high and low optimism derived from *option-holding activity*, *investment ratio* or *net buyer*?

By trying to answer these four questions, we can also re-examine the robustness of dividend premium on dividend decisions. The catering theory (Baker and Wurgler, 2004a) assumes that managers cater to investors' demand on dividends, and ithas nothing to do with managerial overconfidence and managerial extrapolation. Therefore, impact of dividend premium on dividend decisions should not be affected by adding indicators for managerial overconfidence and managerial extrapolation in regressions.

This Chapter 5 contributes to the literature in two main ways: (1) We first discuss different types of managerial overconfidence on dividend decisions, and bring different indicators of managerial overconfidence into the regression functions of Fama and French (2001) and Baker and Wurgler (2004a); (2) Based on the arguments and empirical findings in Chapter 3 and Chapter 4, we test the robustness of our indicators proxy for managerial extrapolation by using different methods of measurement (*earnings*, *sales*, or *cash flow*), and by running a 'horse race' with another widely discussed managerial behaviour bias: managerial overconfidence. We find strong evidence that our indicators are superior among indicators proxy for conventional managerial behaviour bias.

We organise this Chapter 5 as follows. Section 5.2 gives introduction on data selection and variables forming, and then Section 5.3 shows all regression results followed by the discussion of results. In terms of detail, in Section 5.3 we will first test alternative measurements of firms' past dividend-related earnings performance in the same regressions in Chapter 3 and Chapter 4. After confirming the robustness of our indicators formed by using EPS, we will continue to use EPS-related indicators in later joint tests which compare impact of catering theory, managerial overconfidence and managerial extrapolation. The last section, Section 5.4, concludes.

5.2. Data and sample

5.2.1. Data

The same as in Chapter 4, our sample in Chapter 5 covers all NYSE, AMEX, and NASDAQ firms in COMPUSTAT from fiscal year 1963 to 2013 which includes the out-of-sample period from 2001 to 2013. The data of number of shares outstanding, monthly and daily returns and prices of common stocks are from the Center for Research in Security Price (CRSP). All firm-level financial data are from COMPUSTAT.

We use the same sample constructions as was the case in Chapter 3 and Chapter 4 which are from Fama and French (2001), Baker and Wurgler (2004a) and Hoberg and Prabhala (2009). All firms with the following available COMPUSTAT data are included: "total assets (*AT*), stock price (*PRCC_F*) and shares outstanding (*CSHO*) at the end of the fiscal year, income before extraordinary items (*IB*), interest expense (*XINT*), [cash] dividends per share by ex-date (*DVPSX_F*), preferred dividends (*DVP*), and (a) preferred stock liquidating value (*PSTKL*), (b) preferred stock redemption value (*PSTKRV*), or (c) preferred stock carrying value (*PSTK*). Firms must also have (a) stockholders' equity (*SEQ*), (b) liabilities (*LT*), or (c) common equity (*CEQ*) and preferred stock par value (*PSTK*)." A firm must have total assets (*AT*) at its fiscal years t and $t-1$ and have other items at fiscal year t. We exclude firms with book equity below $250,000 or assets below $500,000. We only include the COMPUSTAT sample with CRSP share codes of 10 or 11, and we use the fiscal years where a firm is in the CRSP database at its fiscal year end. All utilities firms (SIC codes 4900 to 4949) and financial firms (SIC codes 6000 to 6999) are excluded from our sample.

There are total 691031 firm-year observations in the original FTP format COMPUSTAT file from 1963 to 2013. After the selection criteria introduced above, there are 138127 satisfied firm-year observations left and go into the regression analysis. Except our indicators of managerial overextrapolation, the summary statistics for some main variables used in regressions have been present in Table 4.1. All definitions for these variables can be found at Appendix 3.1.

We use EXECUCOMP of WRDS to form option-holding-based managerial overconfidence. EXECUCOMP only records managers' compensation data from 1992, so our indicator for managerial overconfidence based on managers' option-holding activities has value from 1992 to 2013. Other estimations of managerial overconfidence, which records the changes in firms' shares owned by CEOs, also use EXECUCOMP's data from 1992 to 2013. The investment ratio proxy for managerial overconfidence is calculated by using COMPUSTAT from 1963 to 2013. We list descriptive statistics for all three alternatives measurements of managerial overconfidence in table 5.1. .Table 5.1 Descriptive statistics for managerial overconfidence, 1992-2013 for option-holding activities and net-buying activities, 1963-2013 for investment ratio.

Table 5.1 reports descriptive statistics for three alternative measurements of managerial overconfidence. *Highopt* and *lowopt* are proxy for managerial overconfidence based on option-holding activities, highinvest and lowinvest are proxy for managerial overconfidence based on investment ratio, and highnet and lownet are proxy for managerial overconfidence based on net-buying activities.

Variable	N	Mean	Std Dev	Min	Max
highopt	69195	0.07	0.25	0	1
lowopt	69195	0.01	0.08	0	1
highinvest	138128	0.04	0.19	0	1
lowinvest	138128	0.04	0.19	0	1
highnet	69195	0.02	0.14	0	1
lownet	69195	0.01	0.10	0	1

5.2.2. Variables

As has been discussed in Section 5.1, we apply Lakonishok et al. (1994)'s method in forming alternative measurements of firms' past performance. We also use Campbell et al. (2011)'s method in measuring managerial overconfidence based on different managers' activities. Besides, we use the same indicators of firms' past growing/declining EPS and dividend decisions as used in Chapter 3 and Chapter 4. Definitions for other used variables can be found in Appendix 3.1 and Appendix 3.2 respectively.

5.2.2.1. Firms' performance measures

The first alternative measurement of firms' past performance is *sales*. *Sales* is calculated as sales (*SALE*) divided by capital at the last fiscal-year-end (*PPENT*) as in Lakonishok et al. (1994). Because the usage of money from sales can vary apart from issuing as dividends, we use free cash flow as another alternative measurement of firms' performance. There are various definitions of free cash flow in accounting literature. Maksy and Chen (2014) summarize these definitions and have a discussion on free cash flow with different methods in calculating functions. In terms of payout policy, Kulchania (2013) calculates free cash flow by using operating income before depreciation (*OIBDP*), minus depreciation (*DP*), income tax (*TXT*), interest and related expense (XINT) and sum of dividends (*DVC* plus *DVP*) all divided by total assets (*AT*). Because we are investigating whether firms' past performance in cash flow, which can be used to distribute dividends, we add common dividends (*DVC*) back based on Kulchania (2013)'s function in calculating *FCF*. Definitions for these two variables can be found in Appendix 5.1.

We form dummies to represent firms' earnings growth/decline over the past three or five years by using the same method to form indicators of EPS growth/decline over the past three/five years. Firms' patterns of past growing/declining *Sales*/*FCF* are defined under two definitions: year-on-year (YoY) growth/decline in *Sales*/*FCF* over the past three or five years; total (general) growth in *Sales*/*FCF* over the past three or five years. We give value 1 to indicators whose firms have such growth/decline in *Sales*/*FCF*, and value 0 otherwise. Definitions of these indicators can be found in Appendix 5.2.

5.2.2.2. Managerial overconfidence measures

There are three alternative measurements for managerial overconfidence referred to in this chapter which can proxy for varying types of overconfidence. The first method is based on managers' option-holding activities and is widely applied in previous literature (see Malmendier and Tate, 2005; Malmendier and Tate, 2008; Campbell, et al., 2011; Malmendier et al., 2011; Ahmed and Duellman, 2013). We use the method developed by Campbell et al. (2011) who follow Malmendier and Tate (2005). Malmendier and Tate define managers as overconfident ones when they are holding vested but unexercised options which are 67% in-the-money (the stock's market price is 67% higher than the option's exercise price), but Campbell et al. (2011) use 100% in the money instead of 67% to classify managers with very high optimism[21]. We follow Campbell et al. (2011)'s method in forming this indicator of managerial overconfidence, because of the availability of the data base and a larger size of data than Malmendier and Tate (2005)'s sample. We use this method also because Campbell et al. (2011) have a discussion about the validity of their method compared with Malmendier and Tate (2005)'s method, and they find that their methods based on EXECUCOMP are consistent with Malmendier and Tate (2005)'s indicators of managerial overconfidence. Therefore, they suggest that the basis of their overconfidence indicators are empirically useful. Following Campbell et al. (2011), highly optimistic CEOs should exhibit this option-holding activity at least

[21] We also test 67%, 200%, and 250% to cut-off in the money option-holding behavior for managers, and find that they give similar results.

twice within the whole sample period, but are defined as highly optimistic ones from the first time they show this activity.

Following Campbell et al. (2011), we first calculate the realizable value of each option as the estimated value of in-the-money unexercised exercisable options (OPT_UNEX_EXER_EST_VAL) divided by the number of unexercised exercisable options (OPT_UNEX_EXER_NUM). We then use stock price at fiscal year-end (PRCC_F) minus this realizable value per option to get the average exercise price per option. Because the average exercise price is the unit cost spent to exercise options, the option's moneyness equals to the unit realizable value of option dividend by the average exercise price. We focus on results based on the cut-off of 100% in defining highly optimistic managers.

As the opposite of managers' high-optimism, we also use Campbell et al. (2011)'s method in defining low-optimism managers. The option moneyness for low-optimism managers is calculated as the unit realized value of options by exercising divided by the average exercise price. The average exercise price equals to the stock price at current fiscal year-end (RPCC_F) minus unit realized value option by exercising, and the unit realized value option by exercising is calculated by using the value realized on option exercise (OPT_EXER_VAL) divided by the number of shares acquired on option exercise (OPT_EXER_NUM). Compared to the definition of the indicator for high-optimism, the indicator for low-optimism has two conditions: (1) CEOs should exercise vested and exercisable options which are less than 30% in unit option moneyness, and (2) CEOs should not hold any unexercised exercisable options which are more than 30% in-the-money. Besides, CEOs must exhibit at least twice the low-optimistic option-holding activities within the sample period, but we record managers as low-optimistic from the first time they exhibit the option exercise behavior. For distinguishing managerial overconfidence based on option-holding activities from the other proxies of managerial overconfidence, we give the variable the name *Highopt* for high-optimism based on option-holding activities, and *Lowopt* for low-optimism based on such behaviour. The detailed description for these variables can be found in Appendix 5.3.

The first proxy for managerial overconfidence is directly related to managers' expectation on their own firms' future market value. Managers who overestimate the future market value may make their forecast based on their overestimation in firms' future investment need or based on their over-believes in firms' future cash flow. We can not exclusively clarify whether this managerial overconfidence is caused by managers' believe in high future investment needs as in Deshmukh et al. (2013) or caused by managers' believe in high future cash flow as in Wu and Liu (2011). However, these two causes could lead to opposite decisions in paying dividends: managers who over-believe in future investment needs may omit/decrease dividends and managers who over-believe in future cash flow may initiate/increase dividends as what we have discussed in section 1.2.2. The discussion about the impact of this proxy for managerial overconfidence on firms' dividend decisions is not the concentration of this thesis. Therefore, we can only give any prediction before we finish the empirical test by using this managerial overconfidence.

Another proxy for managerial overconfidence is formed by using investment ratio. Malmendier and Tate (2005) find that investment has significant correlation with managers' overconfidence, and Campbell et al. (2011) directly use investment ratio as a proxy for managerial overconfidence. We follow Campbell et al. (2011) in calculating investment ratio which equals to capital expenditure (*CAPX*) divided by last fiscal-year-end property, plant, and equipment (*PPENT*). High/low optimistic

CEOs are those whose firms have industry-adjusted investment level at the top/bottom quintile for two continuing years. We give the variable the name *Highinvest* for high-optimism based on option-holding activities, and *Lowinvest* for low-optimism based on such investment behavior. The detailed description for these variables can be found in Appendix 5.3.

The investment ratio used as a proxy for managerial overconfidence can not only be defined as the proxy for managers' expectation on future investment needs, either. High investment in current year does not necessary mean high investment needs in the future, but may represent managers' believe in current investment projects' future cash flow. However, over-investing in current projects may indicate that managers are overconfident in their ability in managing future investment projects, which could lead to high investment in future. Thus, we can not give any exclusive prediction before we have empirical test's results by using investment ratio like by using option-holding activities to form the indicator of managerial overconfidence.

Because of the accessibility of the data, we cannot calculate CEOs' net-purchase based on CEOs' detailed buying and selling activities in their own firms' shares as Campbell et al. (2011) do. However, we use changes in shares owned excluding options (*SHROWN_EXCL_OPTS*) to estimate CEO's net-buying from the last fiscal year to the current fiscal year. We use the same logic as Campbell et al. (2011) in excluding the first time when a CEO is classified as overconfident and repeat the procedure. High-optimistic/Low-optimistic CEOs should satisfy two conditions: (1) a CEO must increase/decrease his (her) shares owned by at least 10% compared with the holding in the last fiscal years, and (2) his (her) shares owned must be ranked at the top/bottom quintile among all CEOs in the current fiscal year.

With the help of this “dirty” proxy for CEOs’ activities in net-buying their own firms’ shares, we can have access to CEOs’ optimism in their firms’ future performance. We give the variable the name *Highnet* for high-optimism based on net-buying activities, and *Lowighnet* for low-optimism based on such activities. See Appendix 5.3 for detailed descriptions of these variables.

The "net-purchase" as a proxy of managerial overconfidence is similar to the "option-holding activity" as a proxy of managerial overconfidence. Both of them directly represent managers' expectation on firms' future market value. CEO's net purchase on their own firms' stocks can also further represent managers' expectation on future general benefits of holding firms' stocks. We can not justify these expected future benefits may come from managers' overconfidence in future stock prices which may be affected by both expectation on future investment needs and future cash flow, or managers' overconfidence in future cash flow partly generated by current investment project.

Compared with these proxy of managerial overconfidence, our indicators for managerial overextrapolation are clear in predicting their impact on firms' dividend decisions. Managerial overextrapolation in this thesis is defined as managers' expectation on future earnings' growth/decline. An overextrapolated manager tends to "pay too much" or "cut too early", when he (she) overextrapolate past earnings' growth or decline into the future. Although we can not ignore the impact of managerial overconfidence on managers' expectation of future earnings' growth/decline when we are arguing that managerial overextrapolation can lead to overestimation of firms' future earnings' growth/decline, we argue that the role of managerial overextrapolation in determining firms' dividend decisions can be separately analysed when proxy of managerial overconfidence is included in the same regression function.

5.3. Results

5.3.1. Alternative measurements of firms' past performance

We use two alternative measurements to evaluate firms' past performance which are related to the cash flow which can be distributed to investors as dividends. The first alternative is a wide definition of earnings which can be distributed to investors: sales and the second alternative is a narrow definition of earnings which can be distributed to investors: free cash flow. As has been described in Section 5.2.2.1, we apply the same method to form indicators proxy for firms' earning performance over the past three or five years, and we then apply these indicators in the same regressions as in Chapter 3 and Chapter 4 to replace previous indicators formed by using EPS.

Table 5.2 illustrates the relationship between propensities to initiate/continue/increase/ pay dividends without controlling risks and indicators of managerial extrapolation calculated based on *Sales* or *FCF*. Firms' patterns of past growing *Sales/FCF* are classified as (1) year-on-year (YoY) growth in *Sales*/*FCF* over the past three or five years, and (2) general growth in Sales/FCF over the past three or five years. We find that firms' past patterns of increasing *Sales/FCF* mostly also have a positive and significant effect on *PTI,* Δ*PTI, PTC, PTIN,* and Δ*PTP*, except the group of firms with *EPSG(1-5)* which have a limited number of observations and the results of *FCF* on *PTC*. Because risks are essential determinants in affecting firms' dividend decisions, we will discuss issues about *FCF*'s results under *PTC* later in results after controlling for risks.

Table 5.2 Propensity to initiate/continue/increase/pay dividends without controlling for risks and indicators based on sales/FCF instead of EPS, 1963-2013

Table 5.2 reports the regression of firms' dividend decisions on their determinants. This table only reports the regression results of propensity to initiate(PTI)/continue(PTC)/increase($PTIN$) and changes in propensity to pay (ΔPTP) on dividend premium ($VW\ P^{D-ND}$), and indicators of managerial extrapolation which from firms' past sales growth (*SaleG(1-3)*, *SaleG(1,3)*, *SaleG(1-5)*, and *SaleG(1,5)*), or free cash flow growth ((*FCFG(1-3)*, *FCFG(1,3)*, *FCFG(1-5)*, and *FCFG(1,5)*), after the first stage regression without controlling for risks (See Chapter 3 and Chapter 4's results' sections for details). This table is divided into five panels which respectively report PTI (Panel A), ΔPTI (Panel B), PTC (Panel C), $PTIN$ (Panel D) and ΔPTP (Panel E) on $VW\ P^{D-ND}$ and indicators of firms' past sales/cash flow growth. Detailed definition for indicators of managerial extrapolation can be found in Appendix 5.2, while definition for other variable above can be found in Appendix 3.1 and Appendix 3.3. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. PTI as dependent variable without controlling for risk

$VW\ P^{D-ND}$	SaleG (1-5)	SaleG(1,5)	SaleG(1-3)	SaleG(1,3)	N	R^2
0.17(14.90)***	0.01 (2.30)**				30198	0.01
0.16(15.29)***		0.01(2.67)***			34429	0.01
0.16(17.52)***			0.01(2.68)***		41198	0.01
0.16(17.72)***				0.01(2.97)***	43962	0.01
$VW\ P^{D-ND}$	FCFG (1-5)	FCFG(1,5)	FCFG(1-3)	FCFG(1,3)		
0.17(14.91)***	-0.01(-0.26)				30198	0.01
0.16(15.43)***		0.02(7.13)***			34429	0.01
0.16(17.50)***			0.01(3.62)***		41198	0.01
0.16(17.71)***				0.01(7.76)***	43962	0.01

Panel B. ΔPTI as dependent variable without controlling for risk

$VW\ P^{D-ND}$	SaleG (1-5)	SaleG(1,5)	SaleG(1-3)	SaleG(1,3)		
0.17(14.75)***	0.01(2.80)***				28960	0.01
0.17(15.25)***		0.01(2.60)***			31530	0.01
0.16(17.60)***			0.01(4.46)***		39702	0.01
0.16(17.62)***				0.01(4.12)***	40979	0.01
$VW\ P^{D-ND}$	FCFG (1-5)	FCFG(1,5)	FCFG(1-3)	FCFG(1,3)		
0.17(14.76)***	0.01(0.44)				28960	0.01
0.17(15.38)***		0.02(8.60)***			31530	0.01
0.16(17.57)***			0.02(6.28)***		39702	0.01
0.16(17.57)***				0.02(10.77)***	40979	0.01

Panel C. PTC as dependent variable without controlling for risk

$VW\ P^{D-ND}$	SaleG (1-5)	SaleG(1,5)	SaleG(1-3)	SaleG(1,3)		
-0.01(-1.24)	0.01(0.40)				37783	0.00
-0.01(-1.10)		0.00(1.77)*			38099	0.00
-0.01(-1.97)**			0.00(1.82)*		43624	0.00
-0.02(2.07)**				0.01(3.74)***	44362	0.00
$VW\ P^{D-ND}$	FCFG (1-5)	FCFG(1,5)	FCFG(1-3)	FCFG(1,3)		
-0.01(-1.23)	0.01(0.12)				37783	0.00
-0.01(-0.98)		0.01(1.47)			38099	0.00
-0.01(-1.90)**			0.01(1.51)		43624	0.00
-0.01(-1.81)**				0.01(4.11)***	44362	0.00

Table 5.2 (continue)

Panel D. PTIN as dependent variable without controlling for risk

VW P^{D-ND}	*SaleG (1-5)*	*SaleG(1,5)*	*SaleG(1-3)*	*SaleG(1,3)*	N	R^2
0.31(16.36)***	0.07(6.50)***				39139	0.01
0.29(15.57)***		0.07(14.47)***			40589	0.01
0.29(16.94)***			0.07(12.39)***		45366	0.01
0.26(15.48)***				0.07(16.48)***	46171	0.01
VW P^{D-ND}	*FCFG (1-5)*	*FCFG(1,5)*	*FCFG(1-3)*	*FCFG(1,3)*		
0.31(16.47)***	0.04(1.30)				39139	0.01
0.31(16.59)***		0.07(14.86)***			40589	0.01
0.30(17.39)***			0.11(11.21)***		45366	0.01
0.28(16.74)***				0.09(19.09)***	46171	0.01

Panel E. ∆PTP as dependent variable without controlling for risk

VW P^{D-ND}	*SaleG (1-5)*	*SaleG(1,5)*	*SaleG(1-3)*	*SaleG(1,3)*		
0.05(6.49)***	0.01(2.53)**				67981	0.00
0.05(6.20)***		0.01(5.59)***			71606	0.00
0.04(5.63)***			0.01(5.56)***		84822	0.00
0.04(4.98)***				0.02(9.49)***	86579	0.00
VW P^{D-ND}	*FCFG (1-5)*	*FCFG(1,5)*	*FCFG(1-3)*	*FCFG(1,3)*		
0.05(6.51)***	0.02(1.90)*				67981	0.00
0.05(6.41)***		0.04(17.83)***			71606	0.00
0.04(5.66)***			0.04(10.65)***		84822	0.00
0.04(5.18)***				0.04(21.99)***	86579	0.00

.

Table 5.3 illustrates the relationship between propensity to initiate/continue/increase/ pay dividends after controlling for risks and indicators of managerial extrapolation calculated based on *Sales* or *FCF*. The only difference in regression models between Table 5.2 and Table 5.3 is that all dependent variables in Table 5.3 are residuals after considering risks in the first-stage regression, while we do not rule out risks to get dependent variables in Table 5.1. We find that firms' past patterns of increasing *Sales/FCF* mostly also have a positive and significant effect on *PTI,* Δ*PTI, PTC, PTIN,* and Δ*PTP*, and this signal is even stronger than that which is shown in Table 5.2 in the case that *FCF* has a positive and significant effect on firms' propensity to continue dividends. As a conclusion, firms' decisions of initiating/continuing/increasing/paying dividends are affected by their past earnings performance, no matter whether we use a wide definition of earnings (*Sales*) or a narrow definition of earnings (*FCF*) which is directly related with firms' available funds which can be used to finance any payout.

Table 5.3 Propensity to initiate/continue/increase/pay dividends after controlling for risks and indicators based on sales/FCF instead of EPS, 1963-2013.

Table 5.3 reports the regression of firms' dividend decisions on their determinants. This table only reports the regression results of propensity to initiate(PTI)/continue(PTC)/increase($PTIN$) and changes in propensity to pay (ΔPTP) on dividend premium ($VW\ P^{D-ND}$), and indicators of managerial extrapolation which from firms' past sales growth (*SaleG(1-3)*, *SaleG(1,3)*, *SaleG(1-5)*, and *SaleG(1,5)*), or free cash flow growth ((*FCFG(1-3)*, *FCFG(1,3)*, *FCFG(1-5)*, and *FCFG(1,5)*), after the first stage regression after controlling for risks (See Chapter 3 and Chapter 4's results' sections for details). This table is divided into five panels which respectively report PTI (Panel A), ΔPTI (Panel B), PTC (Panel C), $PTIN$ (Panel D) and ΔPTP (Panel E) on $VW\ P^{D-ND}$ and indicators of firms' past sales/cash flow growth. Detailed definition for indicators of managerial extrapolation can be found in Appendix 5.2, while definition for other variable above can be found in Appendix 3.1 and Appendix 3.3. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. PTI as dependent variable after controlling for risk						
$VW\ P^{D-ND}$	***SaleG (1-5)***	***SaleG(1,5)***	***SaleG(1-3)***	***SaleG(1,3)***	***N***	R^2
0.18(15.74)***	0.01(2.47)**				29496	0.01
0.18(16.05)***		0.01(2.32)**			32168	0.01
0.17(18.37)***			0.01(2.61)***		40238	0.01
0.17(18.35)***				0.01(2.14)**	41584	0.01
$VW\ P^{D-ND}$	***FCFG (1-5)***	***FCFG(1,5)***	***FCFG(1-3)***	***FCFG(1,3)***		
0.18(15.74)***	-0.01(-0.18)				29496	0.01
0.18(16.17)***		0.01(6.25)***			32168	0.01
0.17(18.35)***			0.01(3.35)***		40238	0.01
0.17(18.34)***				0.01(6.79)***	41584	0.01
Panel B. ΔPTI as dependent variable after controlling for risk						
$VW\ P^{D-ND}$	***SaleG (1-5)***	***SaleG(1,5)***	***SaleG(1-3)***	***SaleG(1,3)***		
0.15(13.17)***	0.02(3.03)***				28288	0.01
0.15(13.65)***		0.01(2.71)**			30783	0.01
0.15(15.71)***			0.01(4.60)***		38779	0.01
0.15(15.72)***				0.01(3.86)**	39996	0.01
$VW\ P^{D-ND}$	***FCFG (1-5)***	***FCFG(1,5)***	***FCFG(1-3)***	***FCFG(1,3)***		
0.15(13.18)***	0.01(0.49)				28288	0.01
0.15(13.78)***		0.02(8.23)***			30783	0.01
0.15(15.67)***			0.02(6.10)***		38779	0.01
0.15(15.69)***				0.02(10.01)***	39996	0.01
Panel C. PTC as dependent variable after controlling for risk						
$VW\ P^{D-ND}$	***SaleG (1-5)***	***SaleG(1,5)***	***SaleG(1-3)***	***SaleG(1,3)***	***N***	R^2
0.02(2.58)***	0.01(2.60)***				36718	0.00
0.02(2.44)**		0.01(2.48)**			37591	0.00
0.02(2.21)**			0.01(2.95)***		42416	0.00
0.01(1.74)*				0.01(4.14)***	42781	0.00
$VW\ P^{D-ND}$	***FCFG (1-5)***	***FCFG(1,5)***	***FCFG(1-3)***	***FCFG(1,3)***		
0.02(2.62)***	0.01(0.46)				36718	0.00
0.02(2.56)**		0.01(3.60)***			37591	0.00
0.02(2.35)**			0.01(1.68)*		42416	0.00
0.01(2.01)**				0.01(5.39)***	42781	0.00

Table 5.3 (continue)

Panel D. PTIN as dependent variable after controlling for risk

VW P^{D-ND}	***SaleG (1-5)***	***SaleG(1,5)***	***SaleG(1-3)***	***SaleG(1,3)***		
0.33(17.39)***	0.08(7.32)***				38036	0.01
0.29(15.57)***		0.07(14.47)***			38988	0.02
0.31(17.75)***			0.08(12.84)***		44112	0.01
0.28(16.22)***				0.07(16.26)***	44505	0.02
VW P^{D-ND}	***FCFG (1-5)***	***FCFG(1,5)***	***FCFG(1-3)***	***FCFG(1,3)***		
0.33(17.49)***	0.05(1.86)				38036	0.01
0.33(17.53)***		0.08(14.68)***			38988	0.02
0.31(18.19)***			0.11(11.81)***		44112	0.01
0.30(17.43)***				0.09(19.31)***	44505	0.02

Panel E. △PTP as dependent variable after controlling for risk

VW P^{D-ND}	***SaleG (1-5)***	***SaleG(1,5)***	***SaleG(1-3)***	***SaleG(1,3)***	N	R^2
-0.05(-5.21)***	0.03(5.51)***				66212	0.00
-0.05(-5.22)***		0.01(7.24)***			69727	0.00
-0.05(-7.07)***			0.02(6.19)***		82652	0.00
-0.06(-7.42)***				0.02(10.28)***	84327	0.00
VW P^{D-ND}	***FCFG (1-5)***	***FCFG(1,5)***	***FCFG(1-3)***	***FCFG(1,3)***		
-0.05(-5.15)***	0.01(1.21)				66212	0.00
-0.04(-4.98)***		0.02(11.44)***			69727	0.00
-0.05(-6.96)***			0.03(6.78)***		82652	0.00
-0.05(-7.02)***				0.03(14.84)***	84327	0.00

Using the same method in running regressions as in Table 5.2 and Table 5.3, we create Table 5.4 and Table 5.5 to test whether firms' past pattern of declining *Sales/FCF* can also have significant effects on firms' dividend decisions as firms' past decreasing EPS can have. Table 5.4 and Table 5.5 respectively report the relationship between propensity to initiate/continue/increase/pay dividends before or after controlling for risks and indicators of managerial extrapolation calculated based on *Sales* or *FCF*. We find that firms' past patterns of declining *Sales/FCF* have a positive and significant effect on *PTO* and *PTD*, when risks are considered in the first-stage regression. Again, we find that *SaleD(1,5)* and *FCFD*(1-5) have a significant effect on *PTO* after controlling risks, while they show no significant effect on *PTO* without controlling for risks. These changes from insignificant impact without given risks to significant impact given risks indicate that risks are one of the essential determinants in dividend decisions as Hoberg and Prabhala (2009) discuss. In summary, firms' decisions of omitting/decreasing dividends are affected by their past declining earnings, no matter whether we use a wide definition of earnings (*Sales*), or a narrow definition of earnings (*FCF*) which is directly related with firms' available funds which can be used to finance any payout.

Table 5.4 Propensity to omit/decrease dividends without controlling for risks and indicators based on sales/FCF instead of EPS, 1963-2013.

Table 5.4 reports the regression of firms' dividend decisions on their determinants. This table only reports the regression results of propensity to omit(*PTO*)/decrease(*PTD*) on dividend premium (*VW* P^{D-ND}), and indicators of managerial extrapolation which from firms' past sales decline (*SaleD(1-3)*, *SaleD(1,3)*, *SaleD(1-5)*, and *SaleD(1,5)*), or free cash flow decline ((*FCFD(1-3)*, *FCFD(1,3)*, *FCFD(1-5)*, and *FCFD(1,5)*), after the first stage regression without controlling for risks (See Chapter 3 and Chapter 4's results' sections for details). This table is divided into two panels which respectively report *PTO* (Panel A) and *PTD* (Panel B) on *VW* $P^{D-ND}$and indicators of firms' past sales/cash flow growth. Detailed definition for indicators of managerial extrapolation can be found in Appendix 5.2, while definition for other variable above can be found in Appendix 3.1 and Appendix 3.3. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. PTO as dependent variable after controlling for risk						
VW P^{D-ND}	***SaleD (1-5)***	***SaleD(1,5)***	***SaleD(1-3)***	***SaleD(1,3)***	***N***	R^2
0.01(1.20)	-0.01(-1.60)				37783	0.00
0.01(1.00)		0.01(0.73)			39099	0.00
0.02(2.04)**			0.01(2.36)**		43624	0.00
0.01(1.96)*				0.01(2.81)***	44362	0.00
VW P^{D-ND}	***FCFD (1-5)***	***FCFD(1,5)***	***FCFD(1-3)***	***FCFD(1,3)***		
0.01(1.23)	0.01(1.07)				37783	0.00
0.01(0.95)		0.01(0.24)			39099	0.00
0.01(2.14)**			0.01(5.33)***		43624	0.00
0.01(1.76)*				0.01(3.10)***	44362	0.00
Panel B. PTD as dependent variable after controlling for risk						
VW P^{D-ND}	***SaleD (1-5)***	***SaleD(1,5)***	***SaleD(1-3)***	***SaleD(1,3)***		
-0.16(-10.09)***	0.02(1.60)				37783	0.00
-0.16(9.66)***		0.03(6.16)***			39099	0.00
-0.15(-9.80)***			0.03(5.50)***		43624	0.00
-0.14(-9.30)***				0.03(7.03)***	44362	0.00
VW P^{D-ND}	***FCFD(1-5)***	***FCFD(1,5)***	***FCFD(1-3)***	***FCFD(1,3)***		
-0.16(-10.11)***	0.03(3.81)***				37783	0.00
-0.16(10.11)***		0.02(5.15)***			39099	0.00
-0.15(-9.84)***			0.03(7.40)***		43624	0.00
-0.15(-9.84)***				0.04(8.89)***	44362	0.00

Table 5.5 Propensity to omit/decrease dividends after controlling for risks and indicators based on sales/FCF instead of EPS, 1963-2013

Table 5.5 reports the regression of firms' dividend decisions on their determinants. This table only reports the regression results of propensity to omit(*PTO*)/decrease(*PTD*) on dividend premium (*VW* P^{D-ND}), and indicators of managerial extrapolation which from firms' past sales decline (*SaleD(1-3), SaleD(1,3)*, *SaleD(1-5),* and *SaleD(1,5)*), or free cash flow decline ((*FCFD(1-3), FCFD(1,3), FCFD(1-5)*, and *FCFD(1,5)*)), after the first stage regression with controlling for risks (See Chapter 3 and Chapter 4's results' sections for details). This table is divided into two panels which respectively report *PTO* (Panel A) and *PTD* (Panel B) on *VW* $P^{D-ND}$and indicators of firms' past sales/cash flow growth. Detailed definition for indicators of managerial extrapolation can be found in Appendix 5.2, while definition for other variable above can be found in Appendix 3.1 and Appendix 3.3. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. PTO as dependent variable after controlling for risk						
VW $\boldsymbol{P^{D-ND}}$	***SaleD (1-5)***	***SaleD(1,5)***	***SaleD(1-3)***	***SaleD(1,3)***	***N***	$\boldsymbol{R^2}$
-0.02(-2.65)***	-0.01(-1.64)				36718	0.00
-0.02(-2.44)***		0.01(2.48)**			37591	0.00
-0.02(-2.22)***			0.01(2.44)**		42416	0.00
-0.01(-1.74)*				0.01(4.14)***	42781	0.00
VW $\boldsymbol{P^{D-ND}}$	***FCFD (1-5)***	***FCFD(1,5)***	***FCFD(1-3)***	***FCFD(1,3)***		
-0.02(-2.62)***	0.01(1.43)				36718	0.00
-0.02(-2.56)**		0.01(3.60)**			37591	0.00
-0.02(-2.08)**			0.01(5.96)***		42416	0.00
-0.01(-2.01)**				0.01(5.39)***	42781	0.00
Panel B. PTD as dependent variable after controlling for risk						
VW $\boldsymbol{P^{D-ND}}$	***SaleD (1-5)***	***SaleD(1,5)***	***SaleD(1-3)***	***SaleD(1,3)***		
-0.17(-10.39)***	0.03(2.24)				36718	0.00
-0.16(9.97)***		0.03(7.61)***			37591	0.00
-0.16(-10.43)***			0.04(6.12)***		42416	0.00
-0.15(-9.62)***				0.03(8.62)***	42781	0.00
VW $\boldsymbol{P^{D-ND}}$	***FCFD(1-5)***	***FCFD(1,5)***	***FCFD(1-3)***	***FCFD(1,3)***		
-0.17(-10.42)***	0.03(3.93)***				36718	0.00
-0.17(10.46)***		0.04(7.39)***			37591	0.00
-0.16(-10.51)***			0.04(7.61)***		42416	0.00
-0.15(-10.24)***				0.05(11.46)***	42781	0.00

We also employ different dependent variables, which represent firms' decisions in terms of "strong" initiation after being non-payers over the past three or five years, in the first-stage regression. These dependent variables (*S3newpayer* and *S5newpayer*) which perform as a robustness check in previous chapters will also perform as a robustness test for indicators formed by using firms' past *Sales/FCF*.

Table 5.6 shows the regression results of propensity to "strongly" initiate dividends after being non-payers over the past three years (*PTS3I*) on indicators of firms' growing *Sales/FCF* over the past three years, after the first-stage regression of *S3newpayer* on conventional factors including *NYP,* Δ*A/A, M/B,* and *E/A* without or with risks. All SaleG or FCFG indicators show significant positive effects on *PTS3I*, when dividend premium is controlled for. As a proxy for catering theory, dividend premium also performs a positive and significant impact on firms' propensity to "strongly" initiate dividends after being non-payers for three years.

Table 5.6 Propensity to "strongly" initiate dividends after being non-payers for three years and indicators based on sales/FCF instead of EPS.

Table 5.6 reports the regression of firms' dividend decisions on their determinants. This table only reports the regression results of propensity to "strong" initiate (*PTS3I*) and changes in propensity to "strong" initiate *(PTS3I*) on dividend premium ($VW\ P^{D-ND}$), and indicators of managerial extrapolation which from firms' past sales growth (*SaleG(1-3)*, *SaleG(1,3)*, *SaleG(1-5)*, and *SaleG(1,5)*), or free cash flow growth ((*FCFG(1-3)*, *FCFG(1,3)*, *FCFG(1-5)*, and *FCFG(1,5)*), after the first stage regression with or without controlling for risks (See Chapter 3 and Chapter 4's results' sections for details). This table is divided into four panels which respectively report *PTS3I* (Panel A and Panel B), Δ*PTS3I* (Panel C and Palen D) without or after controlling for risks, on $VW\ P^{D-ND}$and indicators of firms' past sales/cash flow growth. Detailed definition for indicators of managerial extrapolation can be found in Appendix 5.2, while definition for other variable above can be found in Appendix 3.1 and Appendix 3.3. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Dependent variable: S3newpayer					
Panel A. PTS3I without controlling risk factors			***Panel C. ΔPTS3I without controlling risk factors***		
$VW\ P^{D-ND}$	***SaleG (1-3)***	***SaleG(1,3)***	$VW\ P^{D-ND}$	***SaleG (1-3)***	***SaleG(1,3)***
0.17(17.99)***	0.01(3.36)***		0.17(17.98)***	0.01(4.40)***	
0.16(18.11)***		0.01(3.32)***	0.16(18.02)***		0.01(3.76)***
$VW\ P^{D-ND}$	***FCFG (1-3)***	***FCFG(1,3)***	$VW\ P^{D-ND}$	***FCFG (1-3)***	***FCFG(1,3)***
0.17(17.96)***	0.02(4.64)***		0.16(17.95)***	0.02(6.04)***	
0.16(18.10)***		0.02(8.95)***	0.16(17.97)***		0.02(10.16)***
Panel B. PTS3I after controlling risk factors			***Panel D. ΔPTS3I after controlling risk factors***		
$VW\ P^{D-ND}$	***SaleG (1-3)***	***SaleG(1,3)***	$VW\ P^{D-ND}$	***SaleG (1-3)***	***SaleG(1,3)***
0.16(17.38)***	0.01(3.49)***		0.16(17.70)***	0.01(4.39)***	
0.16(17.32)***		0.01(2.96)***	0.16(17.72)***		0.01(3.41)***
$VW\ P^{D-ND}$	***FCFG (1-3)***	***FCFG(1,3)***	$VW\ P^{D-ND}$	***FCFG (1-3)***	***FCFG(1,3)***
0.16(17.35)***	0.02(4.76)***		0.16(17.66)***	0.02(6.16)***	
0.16(17.32)***		0.02(8.58)***	0.16(17.68)***		0.02(9.97)***

Table 5.7 shows regression results of propensity to "strongly" initiate dividends after being non-payers over the past five years (*PTS5I*) on indicators for firms' growing *Sales/FCF* over the past five years, after the first-stage regression of *S5newpayer* on conventional factors including *NYP,* Δ*A/A, M/B,* and *E/A* without or with risks. Apart from *FCF(1-5)* which shows insignificant positive results which can be caused by the limited observations problem discussed in Section 5.3.1, all other alternative proxies for firms' dividend-related earnings growth over the past five years have significant effects on *PTS5I*. Besides, dividend premium also shows a significant impact on firms' propensity to "strongly" initiate dividends after being non-payers for five years.

Table 5.2 to Table 5.7 inclusive generally reveal that firms' past earnings performance has an impact on managers' dividend decisions, no matter whether we use a "wide" definition of dividend-related earnings performance or a "narrow" definition of dividend-related earnings performance proxy by sales or free cash flow, respectively. Indicators formed by using *Sales/FCF* play a similar role as indicators formed by using EPS to represent firms' past earnings performance in a two-stage framework of regressions (Baker and Wurgler, 2004a). In other words, given a sufficient number of observations, two-stage regression results by using EPSG/EPSD have a reputation in representing results by using varying definitions of firms' past earnings performance. Therefore, we will only show results with indicators formed by using EPS in later analysis.

Table 5.7 Propensity to "strongly" initiate dividends after being non-payers for five years and indicators based on sales/FCF instead of EPS

Table 5.7 reports the regression of firms' dividend decisions on their determinants. This table only reports the regression results of propensity to "strong" initiate (*PTS5I*) and changes in propensity to "strong" initiate *(PTS5I*) on dividend premium ($VW\ P^{D-ND}$), and indicators of managerial extrapolation which from firms' past sales growth (*SaleG(1-5)*, *SaleG(1,5)*, *SaleG(1-5)*, and *SaleG(1,5)*), or free cash flow growth ((*FCFG(1-5)*, *FCFG(1,5)*, *FCFG(1-5)*, and *FCFG(1,5)*), after the first stage regression with or without controlling for risks (See Chapter 5 and Chapter 4's results' sections for details). This table is divided into four panels which respectively report *PTS5I* (Panel A and Panel B), Δ*PTS5I* (Panel C and Palen D) without or after controlling for risks, on $VW\ P^{D-ND}$and indicators of firms' past sales/cash flow growth. Detailed definition for indicators of managerial extrapolation can be found in Appendix 5.2, while definition for other variable above can be found in Appendix 3.1 and Appendix 3.3. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Dependent variable: S5newpayer					
Panel A. PTS5I without controlling risk factors			***Panel C. ΔPTS5I without controlling risk factors***		
$VW\ P^{D-ND}$	***SaleG (1-5)***	***SaleG(1,5)***	$VW\ P^{D-ND}$	***SaleG (1-5)***	***SaleG(1,5)***
0.18(15.24)***	0.01(2.57)**		0.17(14.95)***	0.01(2.85)***	
0.16(15.59)***		0.01(2.91)***	0.17(15.43)***		0.01(2.61)***
$VW\ P^{D-ND}$	***FCFG (1-5)***	***FCFG(1,5)***	$VW\ P^{D-ND}$	***FCFG (1-5)***	***FCFG(1,5)***
0.18(15.25)***	0.01(0.12)		0.17(14.96)***	0.01(0.45)	
0.17(15.74)***		0.02(7.94)***	0.17(15.55)***		0.02(8.08)***
Panel B. PTS5I after controlling risk factors			***Panel D. ΔPTS5I after controlling risk factors***		
$VW\ P^{D-ND}$	***SaleG (1-5)***	***SaleG(1,5)***	$VW\ P^{D-ND}$	***SaleG (1-5)***	***SaleG(1,5)***
0.17(14.76)***	0.01(2.54)**		0.17(14.91)***	0.02(2.89)***	
0.17(15.01)***		0.01(2.48)**	0.17(15.39)***		0.01(2.56)**
$VW\ P^{D-ND}$	***FCFG (1-5)***	***FCFG(1,5)***	$VW\ P^{D-ND}$	***FCFG (1-5)***	***FCFG(1,5)***
0.17(14.76)***	0.01(0.24)		0.17(14.91)***	0.01(0.60)	
0.17(15.15)***		0.02(7.29)***	0.17(15.52)***		0.02(7.87)***

5.3.2. Managerial overconfidence vs. Managerial extrapolation

Based on Malmendier and Tate (2005)'s discussion on managerial overconfidence, we mainly follow Campbell et al. (2011)'s method in forming proxies of managers' high-optimism and low-optimism. This chapter has given a discussion that managerial overconfidence can have varying forms and incentives (also see, Ben-David et al., 2007; Wu and Liu, 2011; Deshmukh et al., 2013) in Section 5.1, so we test respectively three alternative proxies for managerial overconfidence. Specifically, we test managerial overconfidence based on CEOs' option-holding activities, firms' investment ratio and CEOs' net-buying activities on their own firms' shares.

5.3.2.1. Managerial overconfidence based on option-holding activities

As in Campbell et al. (2011), we define managers as high-optimism when they hold unexercised exercisable options which are (more than) 100% in-the-money.[22] In addition, high-optimistic CEOs should exhibit this option-holding activity at least twice within the whole sample period, but we defined the CEO as highly optimistic from the first time they show this activity. See Appendix 5.3 for details about descriptions of all variables in this sub-section.

On the contrary, low-optimistic managers are those who exercise (less than) 30% in-the-money options early, and do not hold any unexercised exercisable options which are more than 30% in-the-money. As defined in Section 5.2.2.2, low-optimism CEOs should exhibit at least twice the low-optimistic option-holding activities as described above within the sample period, and we define CEOs as low-optimism

[22] Malmendier and Tate (2005) define managers as overconfident when they hold vested but unexercised options that are 67% in the money. Campbell et al (2011) have a discussion that 100% cut-off is used to define CEOs who are very overconfident. We also test 67%, 200%, and 250% as cut-off points for in the money option-holding behavior, and find similar results.

CEOs from the first time that they exhibit such option-holding behavior. Our indicator for managerial overconfidence is based on managers' option-holding activities from 1992 to 2013[23].

We design Table 5.8 to test managerial extrapolation proxy by option-holding activities on firms' dividend decisions without controlling for risks. Table 5.8 only lists results for the second-stage regression of residuals from the first-stage regression on dividend premium, managerial overconfidence based on option-holding activities and managerial extrapolation. We initially, in each panel, test *PTI, ∆PTI, PTC, PTIN, ∆PTP, PTO*, and *PTD* on dividend premium, *Highopt*, and *Lowopt*, and then add in indicators of managerial extrapolation for comparison.

The first finding from Table 5.8 is that managerial overconfidence based on option-holding activities does not have consistent significant effects on firms' dividend decisions. When indicators of managerial extrapolation are not added, *Highopt* has a significant effect on *PTI*, and *Lowopt* has a significant effect on *PTC*, *PTIN*, and *PTO*, but these significances disappear after we add in managerial extrapolation. The second finding is that dividend premium does not show significant coefficient for *PTC*, *PTO*, and *PTD*, when indicators of managerial extrapolation mostly show significant and positive effects on dividend decisions. Because risks can be essential explanatory factors on firms' dividend decisions, we will not discuss the results further in Table 5.8, but will do so in Table 5.9 when risks are considered in the first-stage regression.

[23]Campbell et al. (2011) show that using EXECUCOMP has the advantages in data availability as well as a larger data size than that of Malmendier and Tate's (2005) sample. They also show that their managerial overconfidence indicators are related to those of Malmendier and Tate (2005) and are empirically useful.

Table 5.8 Propensity to initiate/continue/increase/pay/omit/decrease dividends without controlling for risks, dividend premium, managerial extrapolation, and managerial overconfidence based on option-holding activities.

Table 5.8 reports coefficient estimates from the second-stage regression of firms' dividend decisions on dividend premium ($VW\ \ P^{D-ND}$), managerial overconfidence based on option-holding activities (*Highopt* and *Lowopt*), and indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)* and *EPSG(1,5))*, or past EPS decline (*EPSD(1-3)*, *EPSD(1,3)*, *EPSD(1-5)*, and *EPSD(1,5))*. The dependent variables *(PTI, ΔPTI, PTC, PTIN, ΔPTP, PTO and PTD)* are the residuals from the first stage Fama-Macbeth logistic regression of dividend decisions on firm characteristics (*NYP*, Δ*A/A*, *M/B*, and *E/A*) without risks, and results are in Panels A, B, C, D, E, F and G respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. $\widetilde{PTI}$ as dependent variable without controlling for risk								
$VW\ \ P^{D-ND}$	*Highopt*	*Lowopt*	*EPSG (1-5)*	*EPSG (1,5)*	*EPSG (1-3)*	*EPSG (1,3)*	*N*	R^2
0.06***(7.56)	0.01**(2.18)	-0.01(-0.42)					44460	0.00
0.08***(5.78)	0.01(1.63)	-4.84E-3(-0.26)	3.82E-3(0.58)				21249	0.01
0.08***(6.22)	0.01(1.26)	-4.03E-3(-0.23)		0.01***(6.14)			24269	0.01
0.08***(6.84)	4.23E-3(1.06)	-0.01(-0.34)			0.01*(1.89)		27777	0.01
0.08***(7.00)	2.69E-3(0.70)	-0.01(-0.39)				0.01***(5.91)	29597	0.01
Panel B. $\Delta\widetilde{PTI}$ as dependent variable without controlling for risk								
0.07***(7.14)	0.01***(4.28)	-0.01(-0.71)					38805	0.00
0.08***(5.8)	0.01***(2.99)	-4.21E-3(-0.22)	0.01(1.03)				19591	0.00
0.08***(6.16)	0.01**(2.35)	-3.74E-3(-0.20)		0.02***(9.03)			21387	0.01
0.08***(6.86)	0.01**(2.39)	-3.78E-3(-0.22)			0.01***(4.18)		25562	0.01
0.08***(6.91)	0.01**(1.99)	-4.78E-3(-0.27)				0.02***(8.38)	26373	0.01
Panel C. $\widetilde{PTC}$ as dependent variable without controlling for risk								
-0.01(-0.31)	1.06E-3(0.20)	0.02**(1.97)					19219	0.00
-0.01(-0.74)	-6.24E-4(-0.12)	0.01(1.28)	0.02**(2.56)				15932	0.00
-0.02(-0.92)	-3.34E-3(-0.63)	0.02(1.62)		0.03***(10.8)			16553	0.01
-0.01(-0.61)	-2.17E-3(-0.42)	0.02(1.48)			0.02***(5.37)		17160	0.01
-0.01(-0.46)	-4.94(-0.95)	0.02(1.63)				0.03***(10.83)	17486	0.01

Table 5.8 (continue)

Panel D. $\widetilde{PTIN}$ as dependent variable without controlling for risk								
VW P^{D-ND}	***Highopt***	***Lowopt***	***EPSG (1-5)***	***EPSG (1,5)***	***EPSG (1-3)***	***EPSG (1,3)***	***N***	***R^2***
0.31***(22.32)	3.47E-3(0.61)	-0.07***(-13.48)					20360	0.01
0.35***(7.76)	-0.01(-0.75)	0.06**(2.10)	0.07***(3.80)				16644	0.01
0.36***(8.10)	-0.02*(1.78)	0.06**(2.29)		0.09***(12.33)			17344	0.02
0.37***(8.33)	-0.01(-1.02)	0.06**(2.34)			0.08***(8.21)		18010	0.01
0.36***(8.35)	-0.02*(-1.71)	0.06**(2.39)				0.10***(14.54)	18371	0.02
Panel E. $\Delta\widetilde{PTP}$ as dependent variable without controlling for risk								
0.11***(8.55)	-5.77E-4(-0.14)	1.85E-3(0.15)					58458	0.00
0.12***(7.73)	4.77E-3(1.02)	-9.89E-4(-0.08)	0.01(1.62)				35531	0.00
0.12***(7.98)	-3.01E-3(-0.65)	2.75E-3(0.22)		0.05***(17.48)			37858	0.01
0.12***(8.78)	-1.81E-3(-0.42)	-5.02E-4(-0.04)			0.03***(7.84)		42706	0.00
0.12***(9.08)	-0.01(-1.23)	1.41E-3(0.12)				0.04***(17.87)	43748	0.01
Panel F. $\widetilde{PTO}$ as dependent variable without controlling for risk								
VW P^{D-ND}	***Highopt***	***Lowopt***	***EPSD (1-5)***	***EPSD(1,5)***	***EPSD (1-3)***	***EPSD (1,3)***	***N***	***R^2***
0.01(0.31)	-1.06E-3(-0.2)	-0.02**(-1.97)					19219	0.00
0.01(0.63)	5.03E-4(0.10)	-0.01(-1.2)	0.08***(3.83)				15932	0.00
0.02(0.90)	2.74E-3(0.52)	-0.02(-1.62)		0.03***(9.38)			16553	0.01
0.01(0.47)	3.10E-3(0.61)	-0.02(-1.41)			0.06***(9.7)		17160	0.01
0.01(0.47)	4.61E-3(0.89)	-0.02(-1.63)				0.03***(9.70)	17486	0.01
Panel G. $\widetilde{PTD}$ as dependent variable without controlling for risk								
-0.01(-0.34)	0.09***(8.91)	-0.07***(-3.12)					19219	0.01
-0.01(-0.29)	0.10***(9.26)	-0.06***(-2.62)	0.13***(3.04)				15932	0.01
-0.01(-0.20)	0.10***(9.52)	-0.07***(-2.96)		0.02***(3.60)			16553	0.01
-0.02(-0.50)	0.10***(9.45)	-0.06***(-2.64)			0.10***(8.38)		17160	0.01
-0.01(-0.41)	0.10***(9.61)	-0.06***(-2.82)				0.04***(6.67)	17486	0.01

We create Table 5.9 to report coefficients of dividend premium, managerial overconfidence based on option-holding activities and managerial extrapolation. In Table 5.9, the results of managerial overreaction are similar to what was reported earlier in Tables 4.1 to Table 4.7 of Chapter 4. Indicators of managerial extrapolation, except *EPSG(1-5)* which has a limited number of observations, show significant positive impact on firms' dividend decisions, while dividend premium only shows significant positive effect on *PTI, ∆PTI,* and *PTIN*. *Highopt* only shows significant positive effect on *PTI*, ∆*PTI*, and *PTD*, and *Lowopt* shows significant effect on both *PTIN* and *PTD*. Although the positive effect of *Highopt* in *PTD*, the positive effect of *Lowopt* in *PTIN* and the negative effect of *Lowopt* in *PTD* are consistent with Deshmukh et al. (2013)'s finding that high-optimism managers tend to reduce dividends because overconfident CEOs tend to overestimate future investment needs and cut current dividends, the positive effect of Highopt on PTI and ∆PTI supports Wu and Li (2011)'s argument that managers tend to increase dividends when they foresee high future cash-flow from current investment. We have discussed the possible causes of mixed results for managerial overconfidence in Section 5.2.2.2, so we will hot discuss them further. When risks are controlled for, we cannot find any evidence that the explanatory power of *Highopt*/*Lowopt* is replaced by indicators of managerial extrapolation. It can indicate that risks are indeed playing the role that managerial overconfidence seems to play in explaining dividend decisions but not another behaviour factor – managerial extrapolation. This finding is consistent with Hoberg and Prabhala (2009)'s argument that risks as fundamental factors are sometimes the reasons for dividend decisions but not the behaviour biases which are "contaminated" by fundamental factors. Compared with dividend premium and managerial overconfidence based on option-holding activities, indicators of managerial extrapolation keep showing consistent and significant effects on dividend decisions, which can indicate that proxy of managerial extrapolation is not "contaminated" by risks.

Table 5.9 Propensity to initiate/continue/increase/pay/omit/decrease dividends after controlling for risks, dividend premium, managerial extrapolation, and managerial overconfidence based on option-holding activities.

This table reports coefficient estimates from the second-stage regression of firms' dividend decisions on dividend premium ($VW\ P^{D-ND}$), managerial overconfidence based on option-holding activities (*Highopt* and *Lowopt*), and indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)* and *EPSG(1,5))*, or past EPS decline (*EPSD(1-3)*, *EPSD(1,3)*, *EPSD(1-5)*, and *EPSD(1,5))*. The dependent variables *(PTI, ∆PTI, PTC, PTIN, ∆PTP, PTO and PTD)* are the residuals from the first stage Fama-Macbeth logistic regression of dividend decisions on firm characteristics (*size*, ∆*A/A*, *M/B*, and *E/A*) and risks, and results are in Panels A, B, C, D and E respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

$VW\ P^{D-ND}$	*Highopt*	*Lowopt*	*EPSG (1-5)*	*EPSG (1,5)*	*EPSG (1-3)*	*EPSG (1,3)*	*N*	R^2
Panel A. $\widetilde{PTI}$ as dependent variable after controlling for risk								
0.06***(6.76)	0.01**(2.40)	-5.43E-4(-0.04)					41795	0.00
0.08***(5.30)	0.01**(2.32)	2.53E-3(0.13)	2.72E-3(0.41)				20801	0.00
0.08***(5.59)	0.01*(1.81)	2.15E-3(0.12)		0.01***(5.39)			22785	0.01
0.08***(6.24)	0.01*(1.79)	8.48E-4(0.05)			4.26E-3(1.46)		27243	0.00
0.07***(6.26)	0.01(1.39)	4.38E-4(0.03)				0.01***(5.22)	28166	0.01
Panel B. $\Delta\widetilde{PTI}$ as dependent variable after controlling for risk								
0.04***(4.87)	0.01***(4.17)	-0.01(-0.53)					38082	0.00
0.06***(3.89)	0.01***(3.05)	-1.04E-3(-0.05)	0.01(1.08)				19185	0.01
0.06***(4.17)	0.01**(2.43)	-7.33E-4(-0.04)		0.02***(8.72)			20944	0.01
0.06***(4.74)	0.01**(2.49)	-3.87E-4(-0.02)			0.01***(4.27)		25072	0.01
0.06***(4.77)	0.01**(2.09)	-1.17E-3(-0.07)				0.02***(8.2)	25858	0.01
Panel C. $\widetilde{PTC}$ as dependent variable after controlling for risk								
-0.02(-1.15)	-0.01(-1.15)	0.02(1.41)					18340	0.00
-0.02(-1.27)	-3.21E-3(-0.62)	0.02(1.42)	0.02**(2.02)				15446	0.00
-0.03(-1.39)	-0.01(-1.19)	0.02(1.44)		0.02***(8.33)			15847	0.01
-0.02(-1.24)	-0.01(-1.05)	0.02(1.49)			0.02***(3.93)		16652	0.00
-0.02(-1.16)	-0.01(-1.31)	0.02(1.48)				0.02***(7.54)	16810	0.00

Table 5.9 (continue)

Panel D. $\widetilde{PTIN}$ as dependent variable after controlling for risk

VW P^{D-ND}	*Highopt*	*Lowopt*	*EPSG (1-5)*	*EPSG (1,5)*	*EPSG (1-3)*	*EPSG (1,3)*	*N*	R^2
0.46***(10.76)	0.01(0.74)	0.08***(2.84)					19384	0.01
0.45***(9.67)	0.01(0.96)	0.08***(2.74)	0.06***(3.30)				16137	0.01
0.45***(9.94)	5.31E-4(0.04)	0.08***(2.87)		0.09***(11.82)			16584	0.02
0.46***(10.15)	0.01(0.87)	0.08***(2.94)			0.07***(7.05)		17480	0.01
0.45***(10.11)	3.75E-3(0.30)	0.08***(2.95)				0.09***(12.76)	17652	0.02
Panel E. $\Delta\widetilde{PTP}$ as dependent variable after controlling for risk								
-0.19***(-14.56)	1.74E-3(0.42)	0.01(0.79)					57110	0.00
-0.24***(-15.44)	0.01(1.64)	0.01(0.77)	0.02***(3.44)				34607	0.01
-0.24***(-15.15)	-1.63E-4(-0.03)	0.01(1.04)		0.04***(15.76)			36877	0.01
-0.23***(-15.85)	3.47E-3(0.77)	0.01(0.92)			0.03***(7.75)		41673	0.01
-0.22***(-15.49)	1.07E-3(0.24)	0.01(0.99)				0.03***(13.22)	42682	0.01

Panel F. $\widetilde{PTO}$ as dependent variable after controlling for risk

VW P^{D-ND}	*Highopt*	*Lowopt*	*EPSD (1-5)*	*EPSD(1,5)*	*EPSD (1-3)*	*EPSD (1,3)*	*N*	R^2
0.02(1.15)	0.01(1.15)	-0.02(-1.41)					18340	0.00
0.02(1.20)	2.99E-3(0.58)	-0.01(-1.37)	0.03*(1.71)				15446	0.00
0.03(1.39)	0.01(1.19)	-0.02(-1.44)		0.02***(8.33)			15847	0.01
0.02(1.13)	0.01(1.20)	-0.02(-1.44)			0.04***(7.24)		16652	0.00
0.02(1.16)	0.01(1.31)	-0.02(-1.48)				0.02***(7.54)	16810	0.00
Panel G. $\widetilde{PTD}$ as dependent variable after controlling for risk								
0.02(0.67)	0.08***(8.27)	-0.05**(-2.46)					18340	0.01
0.02(0.65)	0.09***(8.41)	-0.06**(-2.51)	0.09**(2.08)				15446	0.01
0.02(0.71)	0.09***(8.67)	-0.06***(-2.59)		0.01**(2.28)			15847	0.01
0.02(0.56)	0.09***(8.46)	-0.05**(-2.44)			0.08***(6.16)		16652	0.01
0.02(0.64)	0.09***(8.44)	-0.05**(-2.44)				0.02***(3.50)	16810	0.01

As in Chapter 3 and Chapter 4, we use *S3newpayer* and *S5newpayer* as dependent variables to replace *newpayer* to perform robustness tests and report results of coefficients for dividend premium, managerial overconfidence based on option-holding activities, and managerial extrapolation in Table 5.10. Except for *EPSG(1-5)* which has limited observations, we find a robust impact of managerial extrapolation on firms' propensity to "strongly" initiate dividends.

Table 5.10 Propensity to "strongly" initiate dividends after being non-payers for five or three years, dividend premium, managerial extrapolation, and managerial overconfidence based on option-holding activities.

This table reports coefficient estimates from the second-stage regression of firms' "strong" dividend initiation decisions on dividend premium (*VW* P^{D-ND}), managerial overconfidence based on option-holding activities (*Highopt* and *Lowopt*), and indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5)*). The dependent variables *(PTS3I, ∆PTS3I, PTS5I, ∆PTS5I)* are the residuals from the first stage Fama-Macbeth logistic regression of *S3newpayer* or *S5newpayer* on firm characteristics (*NYP*, ∆*A/A*, *M/B*, and *E/A*) with or without risks, and results are in Panels A, B, C, D, E, F, G and H respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

VW P^{D-ND}	*Highopt*	*Lowopt*	*EPSG(1-3)*	*EPSG(1,3)*
Panel A. *PTS3I* as dependent variable without controlling for risk				
0.06***(7.63)	0.01***(3.76)	-2.68E-3 (-0.20)		
0.08***(6.85)	0.01**(2.27)	-2.56E-3(-0.15)	0.01**(2.43)	
0.08***(7.01)	0.01**(1.96)	-3.34E-3(-0.20)		0.01***(6.43)
Panel B. *PTS3I* as dependent variable after controlling for risk				
0.06***(6.70)	0.01***(3.68)	-5.05E-4(-0.04)		
0.07***(6.14)	0.01***(2.69)	8.49E-4(0.05)	0.01**(2.22)	
0.07***(6.17)	0.01**(2.31)	3.04E-4(0.02)		0.01***(5.86)
Panel C. ∆ *PTS3I* as dependent variable without controlling for risk				
0.06***(6.97)	0.01***(4.53)	-0.01(-0.70)		
0.08***(6.71)	0.01***(2.58)	-4.13E-3(-0.24)	0.01***(3.91)	
0.08***(6.76)	0.01**(2.22)	-4.96E-3(-0.29)		0.02***(7.70)
Panel D. ∆ *PTS3I* as dependent variable after controlling for risk				
0.05**(5.65)	0.01***(4.41)	-0.01(-0.59)		
0.07***(5.43)	0.01***(2.69)	-0.09(-0.10)	0.01***(4.10)	
0.06***(5.46)	0.01**(2.33)	-2.52E-3(-0.14)		0.02***(7.70)

VW P^{D-ND}	*Highopt*	*Lowopt*	*EPSG(1-5)*	*EPSG(1,5)*
Panel E. *PTS5I* as dependent variable without controlling for risk				
0.06***(7.61)	0.01***(5.32)	-4.58E-4 (-0.03)		
0.08***(5.75)	0.02***(3.71)	2.72E-4(0.01)	0.01(1.07)	
0.08***(6.18)	0.01***(3.18)	3.61E-4(0.02)		0.02***(6.85)
Panel F. *PTS5I* as dependent variable after controlling for risk				
0.06***(6.84)	0.01***(4.23)	1.45E-3(0.10)		
0.08***(5.23)	0.02***(3.42)	3.40E-3(0.18)	0.01(1.07)	
0.08***(5.55)	0.01***(2.91)	2.88E-3(0.16)		0.02***(6.55)
Panel G. ∆ *PTS5I* as dependent variable without controlling for risk				
0.06***(6.84)	0.02***(5.77)	-0.01(-0.64)		
0.08***(5.55)	0.02***(3.76)	-3.88E-3(-0.20)	0.01(0.92)	
0.08***(5.88)	0.01***(3.09)	-3.67E-3(-0.20)		0.02***(8.15)
Panel H. ∆ *PTS5I* as dependent variable after controlling for risk				
0.06***(5.96)	0.01***(4.47)	-0.01(-0.60)		
0.07***(4.76)	0.02***(3.27)	-2.42E-3(-0.13)	0.01(0.93)	
0.07***(5.06)	0.01***(2.69)	-2.35E-3(-0.13)		0.02***(8.13)

5.3.2.2. Managerial overconfidence based on investment ratio

We follow Campbell et al. (2011) in forming our second proxy for managerial overconfidence based on investment ratio. Campbell et al. (2011) use investment ratio as a proxy for managerial overconfidence because Malmendier and Tate (2005) find that investment level has significant correlation with managers' overconfidence. We define high (low) optimistic CEOs as those whose firms have industry-adjusted investment ratio at the top (bottom) quintile for two continuing years. Table 5.11 reports second-stage regression results of different dividend decisions on dividend premium, managerial overconfidence based on investment ratio and managerial extrapolation, when risks are not controlled in the first-stage regression in the sample from 1963 to 2013.

We find evidence that the significant effect of *Lowinvest* disappears when managerial extrapolation is considered in Table 5.11. Besides, dividend premium does not have a significant impact on some situations of *PTC* and *PTO*, and directions of dividend premium on *PTC* or *PTO* do not support the argument of catering theory that managers try to satisfy investors who begin to invest more in dividend-paying firms. Except for *EPSG(1-5)* on *PTI* and *PTC*, and *EPSD(1-5)* on *PTO*, other EPS-related indicators show significant positive effects on firms' dividend decisions.

Table 5.11 Propensity to initiate/continue/increase/pay/omit/decrease dividends without controlling for risks, dividend premium, managerial extrapolation, and managerial overconfidence based on investment ratio.

Table 5.11 reports coefficient estimates from the second-stage regression of firms' dividend decisions on dividend premium (*VW* P^{D-ND}), managerial overconfidence based on option-holding activities (*Highinvest* and *Lowinvest*), and indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)* and *EPSG(1,5))*, or past EPS decline (*EPSD(1-3)*, *EPSD(1,3)*, *EPSD(1-5)*, and *EPSD(1,5)).* The dependent variables *(PTI, ΔPTI, PTC, PTIN, ΔPTP, PTO and PTD)* are the residuals from the first stage Fama-Macbeth logistic regression of dividend decisions on firm characteristics (*NYP*, Δ*A/A*, *M/B*, and *E/A*) without risks, and results are in Panels A, B, C, D and E respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

VW P^{D-ND}	*Highinvest*	*Lowinvest*	*EPSG (1-5)*	*EPSG (1,5)*	*EPSG (1-3)*	*EPSG (1,3)*	*N*	R^2
Panel A. $\widetilde{PTI}$ as dependent variable without controlling for risk								
0.16***(25.83)	-4.87E-3(-1.57)	-3.94E-3(-1.20)					70901	0.01
0.17***(14.92)	-0.01(-1.39)	-0.01(-1.01)	0.01(1.06)				30198	0.01
0.16***(15.58)	-0.01*(-1.91)	-2.81E-3(-0.59)		0.02***(7.90)			34429	0.01
0.16***(17.51)	-0.01(-1.26)	-2.01E-3(-0.46)			0.01***(3.52)		41198	0.01
0.16***(17.82)	-0.01(-1.58)	-7.88E-4(-0.19)				0.02***(9.27)	43962	0.01
Panel B. $\Delta\widetilde{PTI}$ as dependent variable without controlling for risk								
0.18***(25.21)	-0.01**(-2.14)	-0.01(-1.46)					63914	0.01
0.17***(14.77)	-0.01*(-1.80)	-0.01(-1.48)	0.03***(4.00)				28960	0.01
0.17***(15.76)	-0.01***(-2.73)	-1.68E-3(-0.34)		0.03***(15.24)			31530	0.02
0.16***(17.54)	-0.01*(-1.94)	-3.67E-3(-0.82)			0.03***(9.32)		39702	0.02
0.16***(17.77)	-0.01**(-2.54)	-2.66E-4(-0.06)				0.03***(17.4)	40979	0.02
Panel C. $\widetilde{PTC}$ as dependent variable without controlling for risk								
1.84E-3 (0.28)	2.87E-3(0.53)	-0.02***(-3.56)					53999	0.00
-0.01(-1.24)	3.28E-3(0.50)	-0.01**(-2.24)	2.03E-3(0.46)				37783	0.00
-0.01(-1.23)	1.33E-3(0.20)	-0.01**(-2.42)		0.01***(6.62)			39099	0.00
-0.02**(-2.01)	3.37E-3(0.56)	-0.01**(-2.16)			0.01**(1.99)		43624	0.00
-0.02**(-2.28)	1.29E-3(0.22)	-0.01*(-1.80)				0.02***(8.03)	44362	0.00

Table 5.11 (continue)

Panel D. $\widetilde{PTIN}$ as dependent variable without controlling for risk								
VW P^{D-ND}	***Highinvest***	***Lowinvest***	***EPSG (1-5)***	***EPSG (1,5)***	***EPSG (1-3)***	***EPSG (1,3)***	***N***	***R^2***
0.31***(22.24)	0.03**(2.16)	-0.06***(-5.26)					56626	0.01
0.31***(16.36)	0.03**(1.98)	-0.07***(-5.43)	0.08***(7.76)				39139	0.01
0.30***(16.09)	0.01(0.90)	-0.06***(-4.49)		0.10***(20.94)			40589	0.02
0.28***(16.47)	0.03**(2.24)	-0.06***(-4.77)			0.10***(16.54)		45366	0.02
0.26***(15.52)	0.02(1.49)	-0.05***(-4.35)				0.12***(26.67)	46171	0.02
Panel E. $\Delta\widetilde{PTP}$ as dependent variable without controlling for risk								
0.10***(14.48)	2.40E-3(0.58)	-0.02***(-4.52)					121269	0.00
0.05***(6.47)	0.01*(1.76)	-0.03***(-5.57)	0.02***(4.95)				67980	0.00
0.05***(6.06)	-2.17E-3(-0.42)	-0.02***(-3.55)		0.07***(35.69)			71606	0.02
0.04***(5.06)	0.01**(2.02)	-0.02***(-5.44)			0.03***(15.25)		84822	0.00
0.03***(3.96)	1.91E-3(0.43)	-0.02***(-3.77)				0.07***(41.11)	86579	0.02
Panel F. $\widetilde{PTO}$ as dependent variable without controlling for risk								
VW P^{D-ND}	***Highinvest***	***Lowinvest***	***EPSD (1-5)***	***EPSD(1,5)***	***EPSD (1-3)***	***EPSD (1,3)***	***N***	***R^2***
-1.84E-3(-0.28)	-2.87E-3(-0.53)	0.02***(3.56)					53999	0.00
0.01(1.24)	-3.25E-3(-0.5)	0.01**(2.23)	0.02(1.13)				37783	0.00
0.01(1.19)	-1.65E-3(-0.25)	0.01**(2.48)		0.01***(5.53)			39099	0.00
0.02**(2.31)	-2.39E-3(-0.40)	0.01*(1.91)			0.04***(9.24)		43624	0.00
0.02**(2.20)	-1.51E-3(-0.25)	0.01*(1.83)				0.01***(7.10)	44362	0.00
Panel G. $\widetilde{PTD}$ as dependent variable without controlling for risk								
-0.16***(-12.54)	-0.01(-1.20)	0.03***(2.70)					53999	0.00
-0.16***(-10.10)	-0.02*(-1.7)	0.01(1.14)	0.18***(6.48)				37783	0.01
-0.16***(-10.01)	-0.01(-1.16)	0.01(1.33)		0.02***(5.25)			39099	0.00
-0.14***(-9.56)	-0.02(-1.62)	0.01(1.20)			0.12***(14.38)		43624	0.01
-0.14***(-9.50)	-0.01(-1.23)	0.01(1.25)				0.03***(8.91)	44362	0.01

When we test managerial extrapolation proxy by investment ratio on firms' dividend decisions after considering risks, the results of managerial overreaction are also similar to what was reported earlier in Table 4.2 to Table 4.7; *EPSG(1,5)*, *EPSG(1-3)*, and *EPSG(1,3)* all show significant positive impact on firms' dividend decisions. In Table 5.12, the negative effect of *Highinvest* on Δ*PTI* generally supports Deshmukh et al. (2013)'s finding, but we find that *Highinvest*/*Lowinvest* has positive/negative effects on both *PTIN* and *PTD*. Besides, the results for dividend premium in Table 12 all support Baker and Wurgler (2004a) in that it has a positive effect on *PTI,* Δ*PTI, PTC* and *PTIN* but a negative effect on *PTD*. It is interesting to find that only risks takeover the explanatory of *Lowinvest* on *PTO*, but not managerial extrapolation. It emphasizes the importance of considering all fundamental factors including risks in explaining dividend policy.

We create Table 5.13 by using *S3newpayer* and *S5newpayer* as dependent variables to replace *newpayer* to perform robustness tests, and we report results of coefficients for dividend premium, managerial overconfidence based on option-holding activities, and managerial extrapolation. This shows the same results as in Table 5.10 except *EPSG(1-5)* with limited observations, which we find robust impact of managerial extrapolation on firms' propensity to "strongly" initiate dividends.

Table 5.12 Propensity to initiate/continue/increase/pay/omit/decrease dividends after controlling for risks, dividend premium, managerial extrapolation, and managerial overconfidence based on investment ratio.

This table reports coefficient estimates from the second-stage regression of firms' dividend decisions on dividend premium ($VW\ P^{D-ND}$), managerial overconfidence based on option-holding activities (*Highopt* and *Lowopt*), and indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)* and *EPSG(1,5)*), or past EPS decline (*EPSD(1-3)*, *EPSD(1,3)*, *EPSD(1-5)*, and *EPSD(1,5)*). The dependent variables *(PTI, ΔPTI, PTC, PTIN,ΔPTP, PTO and PTD)* are the residuals from the first stage Fama-Macbeth logistic regression of dividend decisions on firm characteristics (*size*, *ΔA/A*, *M/B*, and *E/A*) and risks, and results are in Panels A, B, C, D and E respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

$VW\ P^{D-ND}$	*Highinvest*	*Lowinvest*	*EPSG (1-5)*	*EPSG (1,5)*	*EPSG (1-3)*	*EPSG (1,3)*	*N*	R^2
Panel A. $\widetilde{PTI}$ as dependent variable after controlling for risk								
0.17***(26.04)	-1.55E-3(-0.48)	-2.55E-3(-0.74)					41795	0.00
0.18***(15.75)	-3.52E-3(-0.59)	-0.01(-0.96)	0.01(0.87)				20801	0.00
0.18***(16.31)	-0.01(-1.23)	-1.57E-3(-0.31)		0.02***(7.17)			22785	0.01
0.17***(18.36)	-1.90E-3(-0.40)	-1.53E-3(-0.34)			0.01***(3.23)		27243	0.00
0.17***(18.45)	-3.92E-3(-0.85)	7.01E-4(0.16)				0.02***(8.50)	28166	0.01
Panel B. $\Delta\widetilde{PTI}$ as dependent variable after controlling for risk								
0.16***(23.16)	-0.01**(-2.04)	-4.55E-3(-1.24)					38082	0.00
0.15***(13.19)	-0.01*(-1.74)	-0.01(-1.36)	0.03***(4.14)				19185	0.01
0.16***(14.15)	-0.01***(-2.69)	-1.13E-3(-0.22)		0.03***(15.12)			20944	0.01
0.15***(15.65)	-0.01*(-1.91)	-3.02E-3(-0.67)			0.03***(9.63)		25072	0.01
0.15***(15.87)	-0.01**(-2.55)	2.89E-4(0.06)				0.03***(17.32)	25858	0.01
Panel C. $\widetilde{PTC}$ as dependent variable after controlling for risk								
0.02***(3.83)	0.01(1.00)	-0.01**(-2.17)					18340	0.00
0.02***(2.61)	0.01(1.15)	-0.01(-1.56)	4.59E-3(1.07)				15446	0.00
0.02**(2.32)	4.62E-3(0.74)	-0.01(-1.25)		0.02***(7.80)			15847	0.01
0.02**(2.18)	0.01(1.06)	-0.01(-1.11)			0.01***(2.77)		16652	0.00
0.01(1.51)	4.83E-3(0.83)	-4.09E-3(-0.82)				0.02***(9.12)	16810	0.00

Table 5.12 (continue)								
Panel D. $\widetilde{PTIN}$ as dependent variable after controlling for risk								
VW P^{D-ND}	***Highinvest***	***Lowinvest***	***EPSG (1-5)***	***EPSG (1,5)***	***EPSG (1-3)***	***EPSG (1,3)***	***N***	R^2
0.31***(21.92)	0.03***(2.81)	-0.05***(-4.28)					19384	0.01
0.33***(17.4)	0.04***(2.69)	-0.06***(-4.63)	0.07***(7.08)				16137	0.01
0.32***(17.15)	0.02(1.54)	-0.05***(-3.67)		0.10***(19.94)			16584	0.02
0.30***(17.33)	0.04***(2.82)	-0.05***(-3.94)			0.09***(15.87)		17480	0.01
0.28***(16.29)	0.03**(2.13)	-0.04***(-3.58)				0.12***(25.60)	17652	0.02
Panel B. $\Delta\widetilde{PTP}$ as dependent variable after controlling for risk								
0.02**(2.54)	0.01(1.39)	-0.02**(-3.50)					117889	0.00
-0.05***(-5.20)	0.01(1.17)	-0.02***(-3.82)	0.02***(5.13)				66212	0.00
-0.05***(-5.21)	-2.90E-3(-0.52)	-0.01**(-2.48)		0.05***(25.53)			69727	0.01
-0.60***(-7.49)	0.01(1.60)	-0.02***(-3.60)			0.03***(12.85)		82652	0.00
-0.06***(-8.02)	1.61E-3(0.33)	-0.01**(-2.35)				0.06***(30.43)	84327	0.01
Panel E. $\widetilde{PTO}$ as dependent variable after controlling for risk								
VW P^{D-ND}	***Highinvest***	***Lowinvest***	***EPSD (1-5)***	***EPSD(1,5)***	***EPSD (1-3)***	***EPSD (1,3)***	***N***	R^2
-0.02***(-3.83)	-0.01(-1.00)	0.01**(2.17)					51875	0.00
-0.02***(-2.61)	-0.01(-1.13)	0.01(1.55)	0.05***(3.50)				36718	0.00
-0.02**(-2.32)	-4.62(-0.74)	0.01(1.25)		0.02***(7.80)			37591	0.00
-0.01*(-1.86)	-0.01(-0.88)	4.30E-3(0.85)			0.04***(11.21)		42416	0.00
-0.01(-1.51)	-4.83(-0.83)	4.09E-3(0.82)				0.02***(9.12)	42781	0.00
Panel E. $\widetilde{PTD}$ as dependent variable after controlling for risk								
-0.16***(-12.88)	0.11***(7.34)	-0.03(-1.29)					18340	0.01
-0.17***(-10.34)	0.12***(7.54)	-0.04(-1.55)	0.22***(7.81)				15446	0.01
-0.17***(-10.21)	0.12***(7.74)	-0.04(-1.42)		0.04***(9.50)			15847	0.01
-0.15***(-10.02)	0.12***(7.78)	-0.03(-1.21)			0.14***(16.93)		16652	0.01
-0.14***(-9.54)	0.12***(7.71)	-0.03(-1.03)				0.05***(13.41)	16810	0.01

Table 5.13 Propensity to "strongly" initiate dividends after being non-payers for five or three years, dividend premium, managerial extrapolation, and managerial overconfidence based on investment ratio.

This table reports coefficient estimates from the second-stage regression of firms' "strong" dividend initiation decisions on dividend premium ($VW\ P^{D-ND}$), managerial overconfidence based on investment ratio (*Highinvest* and *Lowinvest*), and indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5))*. The dependent variables *(PTS3I, ∆PTS3I, PTS5I, ∆PTS5I)* are the residuals from the first stage Fama-Macbeth logistic regression of *S3newpayer* or *S5newpayer* on firm characteristics (*NYP*, ∆*A/A*, *M/B*, and *E/A*) with or without risks, and results are in Panels A, B, C, D, E, F, G and H respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. *PTS3I* as dependent variable without controlling for risk				
$VW\ P^{D-ND}$	***Highinvest***	***Lowinvest***	***EPSG(1-3)***	***EPSG(1,3)***
0.17***(27.71)	-0.01**(-2.16)	-0.01(-1.66)		
0.17***(17.96)	-0.01(-1.63)	-4.40E-3(-0.99)	0.02***(5.82)	
0.16***(18.24)	-0.01**(-2.07)	-2.06E-3(-0.49)		0.02***(12.05)
Panel B. *PTS3I* as dependent variable after controlling for risk				
0.18***(26.60)	-0.01*(-1.94)	-0.01(-1.64)		
0.16***(17.36)	-0.01(-1.56)	-0.01(-1.13)	0.02***(6.00)	
0.16***(17.47)	-0.01**(-2.05)	-2.46E-3(-0.56)		0.02***(11.73)
Panel C. ∆ *PTS3I* as dependent variable without controlling for risk				
0.18***(26.08)	-0.01**(-2.48)	-3.64E-3(-1.02)		
0.16***(17.94)	-0.01**(-2.10)	-2.54E-3(-0.58)	0.02***(7.99)	
0.16***(18.15)	-0.01***(-2.68)	1.93E-4(0.04)		0.03***(14.33)
Panel D. ∆ *PTS3I* as dependent variable after controlling for risk				
0.18***(25.64)	-0.01**(-2.38)	-3.71E-3(-1.03)		
0.16***(17.65)	-0.01**(-2.04)	-3.15E-3(-0.71)	0.02***(8.16)	
0.16***(17.85)	-0.01***(-2.62)	-4.83E-4(-0.11)		0.03***(14.31)

Panel E. *PTS5I* as dependent variable without controlling for risk				
$VW\ P^{D-ND}$	***Highinvest***	***Lowinvest***	***EPSG(1-5)***	***EPSG(1,5)***
0.18***(28.08)	-0.01**(-2.39)	-0.01(-1.64)		
0.18***(15.26)	-0.01*(-1.69)	-0.01(-1.47)	0.02***(2.60)	
0.17***(15.98)	-0.01**(-2.57)	-3.23E-3(-0.68)		0.02***(10.94)
Panel F. *PTS5I* as dependent variable after controlling for risk				
0.18***(27.26)	-0.01**(-2.40)	-0.01(-1.54)		
0.17***(14.77)	-0.01(-1.63)	-0.01(-1.45)	0.02**(2.55)	
0.17***(15.38)	-0.01**(-2.56)	-3.03E-3(-0.60)		0.02***(10.60)
Panel G. ∆ *PTS5I* as dependent variable without controlling for risk				
0.18***(26.13)	-0.01**(-2.49)	-3.49E-3(-0.98)		
0.17***(14.97)	-0.01*(-1.81)	-0.01(-1.10)	0.02***(3.45)	
0.17***(15.84)	-0.01***(-2.78)	-8.14E-4(-0.16)		0.03***(12.35)
Panel H. ∆ *PTS5I* as dependent variable after controlling for risk				
0.18***(25.86)	-0.01**(-2.43)	-3.09E-3(-0.86)		
0.17***(14.92)	-0.01(-1.64)	-0.01(-1.10)	0.02***(3.57)	
0.17***(15.8)	-0.01***(-2.63)	-6.24E-4(-0.12)		0.03***(12.49)

5.3.2.3. Managerial overconfidence based on net-buying activities

As Section 5.2.2.2 has discussed, we use a "dirty" estimation to proxy for CEOs' changes in their own firms' shareholdings excluding options. We follow Campbell et al. (2011) to define High-optimistic/Low-optimistic CEOs under two conditions: (1) a CEO should increase/decrease his (her) own firms' shareholding by at least 10%, and (2) the CEO's net-buying percentage of shares must be ranked at the top/bottom quintile among all CEOs. We report second-stage regression results of dividend decisions on dividend premium, managerial overconfidence based on CEOs' net-buying activities of their own firms' shares and managerial extrapolation from 1992 to 2013 in Table 5.14, after the first-stage regression without controlling for risks.

We find evidence that the significant effect of *Highinvest* on *PTI* and Δ*PTI* disappears when managerial extrapolation is considered in Table 5.14. Dividend premium does not show any significant impact on *PTC*, *PTO* or *PTD*, and we find that directions of dividend premium on *PTC* or *PTO* do not support the argument of catering theory. Except for *EPSG(1-5)* on *PTI* and Δ*PTI*, other EPS-related indicators show significant positive effects on firms' dividend decisions.

Table 5.14 Propensity to initiate/continue/increase/pay/omit/decrease dividends without controlling for risks, dividend premium, managerial extrapolation, and managerial overconfidence based on net-buying activities.

This table reports coefficient estimates from the second-stage regression of firms' dividend decisions on dividend premium (*VW* P^{D-ND}), managerial overconfidence based on net-buying activities (*Highnet* and *Lownet*), and indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5))*, or past EPS decline (*EPSD(1-3)*, *EPSD(1,3)*, *EPSD(1-5)*, and *EPSD(1,5))*. The dependent variables *(PTI,* Δ*PTI, PTC, PTIN,* Δ*PTP, PTO,* and *PTD)* are the residuals from the first stage Fama-Macbeth logistic regression of dividend decisions on firm characteristics (*NYP*, Δ*A/A*, *M/B*, and *E/A*) excluding risks, and results are in Panels A, B, C, D, E, F and G respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

VW P^{D-ND}	*Highnet*	*Lownet*	*EPSG (1-5)*	*EPSG (1,5)*	*EPSG (1-3)*	*EPSG (1,3)*	*N*	R^2
Panel A. $\widetilde{PTI}$ as dependent variable without controlling for risk								
0.06***(7.45)	0.01**(2.27)	0.01(1.59)					44460	0.00
0.08***(5.70)	0.01(0.84)	0.01(0.74)	0.00(0.64)				21249	0.01
0.08***(6.15)	0.01(0.69)	0.01(1.47)		0.01***(6.26)			24269	0.01
0.08***(6.78)	0.01(1.23)	0.01(0.54)			0.01*(1.95)		27777	0.01
0.08***(6.95)	0.01(1.07)	0.01(0.84)				0.01***(5.96)	29597	0.01
Panel B. Δ$\widetilde{PTI}$ as dependent variable without controlling for risk								
0.06***(6.95)	0.02***(3.21)	0.02***(2.75)					38805	0.00
0.08***(5.67)	0.01(1.20)	0.02(1.51)	0.01(1.14)				19591	0.01
0.08***(6.04)	0.01(1.08)	0.02**(2.19)		0.02***(9.24)			21387	0.01
0.08***(6.75)	0.01*(1.70)	0.01(1.33)			0.01***(4.30)		25562	0.01
0.08***(6.81)	0.01(1.56)	0.02*(1.66)				0.02***(8.52)	26373	0.01
Panel C. $\widetilde{PTC}$ as dependent variable without controlling for risk								
-0.01(-0.29)	5.59E-4(0.07)	-0.01(-0.79)					19219	0.00
-0.01(-0.72)	-1.74E-3(-0.24)	-0.01(-0.51)	0.02**(2.53)				15932	0.01
-0.02(-0.87)	-0.01(-0.69)	-0.01(-0.78)		0.03***(10.79)			16553	0.01
-0.01(-0.58)	-2.55E-3(-0.35)	-0.01(-0.92)			0.02***(5.33)		17160	0.01
-0.01(-0.42)	-2.57E-3(-0.34)	-0.01(-1.10)				0.03***(10.79)	17486	0.01

Table 5.14 (continue)								
Panel D. $\widetilde{PTIN}$ as dependent variable without controlling for risk								
VW P^{D-ND}	*Highnet*	*Lownet*	*EPSG (1-5)*	*EPSG (1,5)*	*EPSG (1-3)*	*EPSG (1,3)*	*N*	R^2
0.37***(8.97)	-0.14***(-7.73)	-1.74E-3(-0.06)					20360	0.01
0.36***(7.94)	-0.15***(-8.11)	0.02(0.76)	0.07***(3.79)				16644	0.01
0.37***(8.33)	-0.15***(-8.46)	0.01(0.21)		0.09***(12.38)			17344	0.02
0.38***(8.52)	-0.15***(-8.07)	0.01(0.39)			0.08***(8.15)		18010	0.01
0.37***(8.56)	-0.15***(-8.23)	-1.16E-3(-0.04)				0.10***(14.57)	18371	0.02
Panel E. $\Delta\widetilde{PTP}$ as dependent variable without controlling for risk								
0.11***(8.53)	0.01(1.06)	2.69E-3(0.27)					58458	0.00
0.11***(7.70)	-1.19E-3(-0.16)	2.65E-3(0.25)	0.01*(1.66)				35531	0.00
0.12***(8.00)	-2.44E-3(-0.33)	4.59E-3(0.43)		0.05***(17.48)			37858	0.01
0.12***(8.80)	-2.03E-3(-0.29)	-0.01(-0.56)			0.03***(7.84)		42706	0.00
0.12***(9.13)	-2.47E-3(-0.35)	-4.14E-3(-0.42)				0.04***(17.84)	43748	0.01
Panel F. $\widetilde{PTO}$ as dependent variable without controlling for risk								
VW P^{D-ND}	*Highnet*	*Lownet*	*EPSD (1-5)*	*EPSD(1,5)*	*EPSD (1-3)*	*EPSD (1,3)*	*N*	R^2
0.01(0.29)	-5.59E-4(-0.07)	0.01(0.79)					19219	0.00
0.01(0.61)	1.99E-3(0.27)	0.01(0.58)	0.08***(3.85)				15932	0.01
0.02(0.85)	0.01(0.66)	0.01(0.77)		0.03***(9.37)			16553	0.01
0.01(0.43)	3.88E-3(0.53)	0.01(0.90)			0.06***(9.69)		17160	0.01
0.01(0.42)	2.52E-3(0.34)	0.01(1.08)				0.03***(9.67)	17486	0.01
Panel G. $\widetilde{PTD}$ as dependent variable without controlling for risk								
-0.02(-0.70)	0.14***(9.23)	-0.01(-0.53)					19219	0.00
-0.03(-0.73)	0.15***(9.63)	-0.03(-1.03)	0.13***(3.05)				15932	0.01
-0.02(-0.66)	0.15***(9.76)	-0.01(-0.54)		0.02***(3.04)			16553	0.01
-0.03(-0.89)	0.15***(9.81)	-0.01(-0.59)			0.10***(8.14)		17160	0.01
-0.03(-0.81)	0.14***(9.65)	-3.68E-3(-0.16)				0.04***(6.14)	17486	0.01

When we test managerial extrapolation proxy by net-buying activities on firms' dividend decisions, we find similar results to what was reported earlier in Table 4.2 to Table 4.7 in Table 5.15 where risks are controlled for in first-stage regressions. CEOs who observe past earnings growth tend to initiate/continue/increase/pay dividends, while CEOs who observe past EPS decline tend to omit/decrease dividends. The negative effect of *Highnet* on *PTIN* and the positive effect of *Lownet* on *PTD* are consistent with Deshmukh et al. (2013)'s paper, but we find that *Lownet* has no significant effect on firms' dividend decisions in most circumstances. Besides, dividend premium has a significant positive effect on *PTI*, Δ*PTI*, and *PTIN*, but insignificant effect on *PTC* and *PTD*. In Table 51.4, we find no evidence that risks are replacing the explanatory power of *Highnet* on *PTI* or Δ*PTI*, which may indicate that risks cannot explain all possible explanatory power of managerial extrapolating in replacing managerial overconfidence to explain firms' dividend decisions. In summary, indicators of managerial overreaction show a robust impact on firms' dividend decisions, while other proxy for behaviour bias including dividend premium and managerial overconfidence does not have such a consistent effect on these dividend decisions.

We create Table 5.16 by using *S3newpayer* and *S5newpayer* as dependent variables to replace *newpayer* in running robustness tests and report results. This shows the same results as in Table 5.10 and Table 5.13, except for *EPSG(1-5)*, and we find that managerial extrapolation has robust explanatory power in explaining firms' propensity to "strongly" initiate dividends.

Table 5.15 Propensity to initiate/continue/increase/pay/omit/decrease dividends after controlling for risks, dividend premium, managerial extrapolation, and managerial overconfidence based on net-buying activities.

This table reports coefficient estimates from the second-stage regression of firms' dividend decisions on dividend premium (*VW* P^{D-ND}), managerial overconfidence based on net-buying activities (*Highnet* and *Lownet*), and indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5))*, or past EPS decline (*EPSD(1-3)*, *EPSD(1,3)*, *EPSD(1-5)*, and *EPSD(1,5))*. The dependent variables *(PTI, ΔPTI, PTC, PTIN, ΔPTP, PTO,* and *PTD)* are the residuals from the first stage Fama-Macbeth logistic regression of dividend decisions on firm characteristics (*NYP*, *ΔA/A*, *M/B*, and *E/A*) and risks, and results are in Panels A, B, C, D, E, F and G respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

VW P^{D-ND}	*Highnet*	*Lownet*	*EPSG (1-5)*	*EPSG (1,5)*	*EPSG (1-3)*	*EPSG (1,3)*	*N*	R^2
Panel A. $\widetilde{PTI}$ as dependent variable after controlling for risk								
0.06***(6.64)	0.01**(2.23)	0.01*(1.76)					41795	0.00
0.08***(5.21)	0.01(0.86)	0.01(0.97)	0.00(0.49)				20801	0.00
0.08***(5.51)	0.01(0.69)	0.02(1.62)		0.01***(5.54)			22785	0.01
0.07***(6.16)	0.01(1.28)	0.01(0.82)			0.00(1.54)		27243	0.00
0.07***(6.19)	0.01(1.13)	0.01(1.08)				0.01***(5.31)	28166	0.01
Panel B. $\Delta\widetilde{PTI}$ as dependent variable after controlling for risk								
0.04***(4.68)	0.02***(2.95)	0.02***(2.86)					38082	0.00
0.05***(3.75)	0.01(0.99)	0.02*(1.71)	0.01(1.18)				19185	0.01
0.06***(4.05)	0.01(0.85)	0.02**(2.32)		0.02***(8.93)			20944	0.01
0.06***(4.62)	0.01(1.49)	0.01(1.49)			0.01***(4.38)		25072	0.01
0.06***(4.67)	0.01(1.36)	0.02*(1.80)				0.02***(8.35)	25858	0.01
Panel C. $\widetilde{PTC}$ as dependent variable after controlling for risk								
-0.02(-1.09)	-1.84E-3(-0.25)	-0.01(-1.04)					18340	0.00
-0.02 (-1.24)	1.48E-3(0.20)	-2.84E-3(-0.24)	0.01**(1.98)				15446	0.00
-0.02(-1.33)	-3.02E-3 (-0.28)	-0.01(-0.57)		0.02***(8.26)			15847	0.01
-0.02(-1.20)	-6.25E-4 (-0.08)	-0.01(-0.67)			0.02***(3.86)		16652	0.00
-0.02(-1.11)	-1.34E-3 (-0.18)	-0.01(-0.75)				0.02***(7.47)	16810	0.00

Table 5.15 (continue)

Panel D. $\widetilde{PTIN}$ as dependent variable after controlling for risk								
VW P^{D-ND}	***Highnet***	***Lownet***	***EPSG (1-5)***	***EPSG (1,5)***	***EPSG (1-3)***	***EPSG (1,3)***	N	R^2
0.46***(10.86)	-0.11***(-6.39)	0.03 (1.17)					19384	0.01
0.45***(9.78)	-0.13***(-6.73)	0.05*(1.79)	0.06***(3.33)				16137	0.01
0.46***(10.09)	-0.13***(-7.00)	0.04(1.43)		0.09***(11.96)			16584	0.02
0.46***(10.25)	-0.12***(-6.74)	0.04(1.49)			0.07***(7.04)		17480	0.01
0.46***(10.24)	-0.13***(-6.93)	0.04(1.24)				0.09***(12.88)	17652	0.02
Panel E. $\Delta\widetilde{PTP}$ as dependent variable after controlling for risk								
-0.19***(-14.58)	0.01(0.89)	3.64E-3(0.36)					57110	0.00
-0.25***(-15.5)	0.01(0.80)	0.01(0.87)	0.03***(3.49)				34607	0.01
-0.24***(-15.16)	3.33E-3(0.43)	0.01(0.88)		0.04***(15.79)			36877	0.01
-0.23***(-15.88)	0.01(0.73)	4.08E-3(0.40)			0.03***(7.78)		41673	0.01
-0.22***(-15.51)	3.88E-3(0.53)	4.89E-3(0.48)				0.03***(13.25)	42682	0.01
Panel F. $\widetilde{PTO}$ as dependent variable after controlling for risk								
VW P^{D-ND}	***Highnet***	***Lownet***	***EPSD (1-5)***	***EPSD(1,5)***	***EPSD (1-3)***	***EPSD (1,3)***	N	R^2
0.02(1.09)	1.84E-3(0.25)	0.01(1.04)					18340	0.00
0.02(1.17)	-1.38E-3(-0.19)	3.33E-3(0.28)	0.04*(1.72)				15446	0.00
0.02(1.33)	2.06E-3(0.28)	0.01(0.57)		0.02***(8.26)			15847	0.01
0.02(1.09)	1.64E-3(0.22)	0.01(0.66)			0.04***(7.19)		16652	0.00
0.02(1.11)	1.34E-3(0.18)	0.01(0.75)				0.02***(7.47)	16810	0.00
Panel G. $\widetilde{PTD}$ as dependent variable after controlling for risk								
0.012(0.35)	0.13***(8.75)	-0.02(-1.05)					18340	0.01
0.01(0.27)	0.13***(8.61)	-0.04(-1.54)	0.09**(2.08)				15446	0.01
0.01(0.30)	0.13***(8.82)	-0.03(-1.29)		0.01*(1.76)			15847	0.01
0.01(0.23)	0.13***(8.86)	-0.03(-1.13)			0.07***(5.93)		16652	0.01
0.01(0.29)	0.13***(8.84)	-0.02(-0.98)				0.02***(3.04)	16810	0.01

Table 5.16 Propensity to "strongly" initiate dividends, dividend premium, managerial extrapolation, and managerial overconfidence based on net-buying activities.

This table reports coefficient estimates from the second-stage regression of firms' "strong" dividend initiation decisions on dividend premium ($VW\ P^{D-ND}$), managerial overconfidence based on net-buying activities (*Highnet* and *Lownet*), and indicators of managerial overreaction based on firms' past EPS growth (*EPSG(1-3)*, *EPSG(1,3)*, *EPSG(1-5)*, and *EPSG(1,5))*. The dependent variables *(PTS3I, ∆PTS3I, PTS5I, ∆PTS5I)* are the residuals from the first stage Fama-Macbeth logistic regression of *S3newpayer* or *S5newpayer* on firm characteristics (*NYP*, ∆*A/A*, *M/B*, and *E/A*) with or without risks, and results are in Panels A, B, C, D, E, F, G and H respectively. *** represents significance in the critical level of 1%; ** represents significance in the critical level of 5%; * represents significance in the critical level of 10%.

Panel A. *PTS3I* as dependent variable without controlling for risk				
VW $\boldsymbol{P^{D-ND}}$	***Highnet***	***Lownet***	***EPSG(1-3)***	***EPSG(1,3)***
0.06***(7.47)	0.02***(2.86)	0.02**(2.19)		
0.08***(6.75)	0.01*(1.69)	0.01(0.99)	0.01**(2.54)	
0.08***(6.91)	0.01(1.55)	0.01(1.31)		0.01***(6.56)
Panel B. *PTS3I* as dependent variable after controlling for risk				
0.06***(6.54)	0.02***(2.60)	0.02**(2.29)		
0.07***(6.02)	0.01(1.49)	0.01(1.19)	0.01**(2.34)	
0.07***(6.06)	0.01(1.38)	0.01(1.47)		0.01***(6.02)
Panel C. ∆*PTS3I* as dependent variable without controlling for risk				
0.06***(6.76)	0.02***(3.29)	0.02***(2.84)		
0.08***(6.59)	0.01*(1.75)	0.01(1.38)	0.01***(4.04)	
0.08***(6.65)	0.01*(1.65)	0.02*(1.72)		0.02***(7.86)
Panel D. ∆*PTS3I* as dependent variable after controlling for risk				
0.05***(5.45)	0.02***(3.07)	0.02***(2.98)		
0.06***(5.31)	0.01(1.57)	0.01(1.55)	0.01***(4.23)	
0.06***(5.35)	0.01(1.47)	0.02*(1.87)		0.02***(7.86)

Panel E. *PTS5I* as dependent variable without controlling for risk				
VW $\boldsymbol{P^{D-ND}}$	***Highnet***	***Lownet***	***EPSG(1-5)***	***EPSG(1,5)***
0.06***(7.42)	0.02***(3.10)	0.02**(2.41)		
0.08***(5.59)	0.01(1.39)	0.01(1.29)	0.01(1.18)	
0.08***(6.04)	0.01(1.28)	0.02**(2.04)		0.02***(7.14)
Panel F. *PTS5I* as dependent variable after controlling for risk				
0.06***(6.65)	0.02***(2.94)	0.02***(2.64)		
0.07***(5.09)	0.01(1.22)	0.02(1.57)	0.01(1.18)	
0.07***(5.42)	0.01(1.13)	0.02**(2.24)		0.02***(6.79)
Panel G. ∆*PTS5I* as dependent variable without controlling for risk				
0.06***(6.61)	0.02***(3.33)	0.02***(2.88)		
0.08***(5.39)	0.01(1.28)	0.02(1.56)	0.01(1.04)	
0.08***(5.74)	0.01(1.20)	0.02**(2.27)		0.02***(8.43)
Panel H. ∆*PTS5I* as dependent variable after controlling for risk				
0.05***(5.76)	0.02***(3.16)	0.02***(3.05)		
0.07***(4.62)	0.01(1.12)	0.02*(1.75)	0.01(1.04)	
0.07***(4.93)	0.01(1.04)	0.02**(2.43)		0.02***(8.36)

5.4. Conclusion

As one of the managerial behaviour biases which can have an impact on managers' dividend decisions, managerial overreaction from firms' past earnings performance is still not discussed in relevant previous literature, while other managerial behaviour biases such as catering incentives or overconfidence have been discussed and tested under the issue of firms' dividend policies. We find empirical evidence that managers tend to overextrapolate firms' past EPS growth/decline into the future in Chapter 3 and Chapter 4, and this managerial overextrapolation can affect managers' dividend decisions because overextrapolating managers wrongly believe that firms' past earnings' increases/decreases will last for a longer time when firms will have more/less cash to pay out as dividends. However, we do not test whether managerial extrapolation can still have a significant impact on firms' dividend policies given managerial overconfidence which may also have an impact on dividend decisions. In this Chapter, we further discuss the robustness of managerial extrapolation's effect on firms' dividend policy by using two methods: (1) we try to release or narrow the definition of firms' past earnings performance by using alternative measurements of firms' dividend-related earnings, and we test whether these different definitions of dividend-related earnings can have a similar effect on firms' dividend decisions as EPS does; (2) we add in managerial overconfidence indicators proxy by different managers' activities or observable accounting data (managerial overconfidence based on CEOs' option-holding activities, managerial overconfidence based on investment ratio and managerial overconfidence based on managers' net-buying activities on their own firms' shares) in the second-stage regression, after getting residuals from the first-stage regression which regress firms' dividend decisions on conventional factors (size, profitability, investment opportunities, and risks), and we then compare the degrees of influence among catering incentive, managerial overconfidence and managerial extrapolation.

We have four main findings in this chapter. (1) We find that alternative measurements of firms' past dividend-related earnings performance – sales or free cash flow can perform similarly as EPS can do in explaining managers' extrapolation of past earnings performance into the future and then make dividend decisions. (2) We find mixed results for the impact of managerial overconfidence by using different measurements. Spectacularly, we find results which are consistent with Ben-David et al. (2007), Wu and Liu (2011) and Deshmukh et al. (2013), but these results are not robust in different regressions with varying dependent variables. (3) Dividend premium (Baker and Wurgler, 2004a) shows significant impact on firms' dividend decisions in most circumstances, but its significant effect is not robust when managerial overconfidence and managerial extrapolation are considered in different regression functions. (4) We find that indicators of managerial extrapolation which proxy by firms' earnings growth/decline over the past three or five years have consistent and significant effects on firms' dividend decisions, given other conventional factors and other factors representing managerial behaviour activities.

As a concluding chapter for previous empirical chapters (Chapter 3 and Chapter 4), Chapter 5 extends the "horse race" among different determinants of firms' dividend policy to a larger scale, in terms of possible explanatory factors proxy for managerial behaviour activities. During the sample period from 1963 to 2013, indicators for managerial extrapolation consistently show significant effects on different dividend decisions including dividend initiation, continuation, increase, paying, omission and decrease, while other behaviour factors cannot keep their significant impact on these dividend decisions. In other words, indicators of managerial extrapolation win the “horse race” in terms of consistency. Although it (managerial extrapolation) may only be one piece of the whole cake in determinants of dividend policy, it always shows up when other pieces of the cake cannot. Therefore, this empirical chapter jointly with the previous two empirical chapters shed the light on the issue of using psychology theory to explain firms’ dividend decisions and guide investors in understanding what managerial behaviour factors are behind the phenomena of paying dividends.

CHAPTER 6 CONCLUSION

Previous literature has presented a thorough and wide ranging discussion of the determinants of firms' dividend policies. We find an important research gap among these determinants: among behaviour factors that are used to explain firms' dividend decisions, managerial extrapolation is still not discussed. Based on the experimental psychology theory that individuals can break Bayes' rule by overreacting to the representativeness of limited information (overestimation on a small sample of observations in Kahneman and Tversky (1974)), we posit a hypothesis that managers may extrapolate firms' past earnings performance into the future. Specifically, managers can make wrong dividend decisions based on their overextrapolation of past earnings growth/decline into the future. We discuss this hypothesis in this thesis and find robust empirical evidence of it.

We develop three empirical chapters to examine managerial extrapolation in this thesis. Firstly, Chapter 3 jointly tests managerial extrapolation on past earnings growth/decline on firms' dividend decisions by following the methodology of Baker and Wurgler (2004a) and Hoberg and Prabhala (2009). We design indicators which record firms' growing/decreasing EPS over the past five or three years to represent managers' extrapolation of past earnings performance in Chapter 3, and we create variables which are residuals from Fama-Macbeth logistic regressions which regress indicator of dividend decisions on conventional determinants including firms' sizes, investment opportunities, profitability (see Fama and French, 2001) and risks (see Hoberg and Prabhala, 2009). We then use these residuals as dependent variables which represent firms' propensity to initiate/continue/increase/pay/omit/decrease dividends in the second stage regression on managers' catering incentive based on investors' behaviour biases (the dividend premium of Baker and Wurgler (2004a)) and indicators of managerial extrapolation. Based on in-sample data from 1963 to 2000, we find that firms' excellent/pessimistic past EPS performance can positively/negatively affect managers' dividend decisions. Chapter 3 also provides evidence that managers who choose to initiate/continue/increase/pay dividends after observing past growing EPS overreacted to the representativeness of past growth in earnings, because they cannot correctly predict future earnings growth after making decisions to initiate/continue/increase/pay dividends. In addition, neither can managers who choose to omit/decrease dividends after observing past decline in EPS correctly predict future earnings performance after making dividend decisions. These findings support our hypothesis that managers' activities in extrapolating past earnings performance into the future represent managers' overreaction to firms' past performance (managers are overexterapolated). Therefore, indicators for managerial extrapolation represent a type of managerial behaviour bias, and this bias affects managers' dividend decisions.

We find the reappearance of dividends around 2000 (Julio and Ikenberry, 2004) is shown up with the same movement of percentage for firms with growing EPS over the past five or three years. Therefore, we make Chapter 4 a straight extension of Chapter 3 by using the same methodology but a different sample period. In Chapter 4, we test indicators of managerial extrapolation on firms' propensity to initiate/continue/increase/pay/omit /decrease dividends, jointly with managers' catering incentive (dividend premium) in the out-of-sample period from 2001 to 2013 as well as the whole sample period from 1963 to 2013. During the out-of-sample period from 2001 to 2013 and the whole sample from 1963 to 2013, we find robust evidence that indicators of managerial extrapolation have significant effects on firms' dividends and on managers who make dividend decisions based on past streams of increasing/decreasing EPS overreact. In contrast to Chapter 3, Chapter 4 provides evidence that other determinants, including investment opportunities, risks or dividend premium cannot always have robust effects on managers' dividend decisions, while managerial extrapolation can keep having explanatory power on these decisions. As an unique contribution of Chapter 4, we discusses the possible impact of financial crisis or recession on firms' dividend decisions and discusses whether results for our indicators of managerial overextrapolation will be affected by controlling for financial crisis or recession.

In previous literature, managerial overconfidence is also a key determinant of firms' dividend policy (see Deshmukh et al., 2013). The psychology literature provides different definitions for varying types of 'overconfidence' (see Moore and Healy, 2008), and it also distinguishes 'overextrapolation' from 'overconfidence' (see Alti and Tellock, 2014). Both performing in representing managers' biases, managerial overconfidence and managerial overextrapolation should be tested in the same model for a comparison. Thus, we use Chapter 5 to run a 'horse race' among three managerial behaviour factors: managers' catering incentive (dividend premium), managerial overconfidence (respectively based on managers' option-holding activities, investment ratio and managers' net-buying activities in their own firms' shares) and managerial extrapolation (firms' past stream of earnings growth/decline). During the whole sample period from 1963 to 2013, we compare these managerial behaviour factors and find that proxy of managerial extrapolation perform at least as well as the other two behaviour factors in explaining firms' dividend decisions. In addition, Chapter 5 shows that findings based on indicators of managerial extrapolation formed by using EPS are robust, after we use alternative measurements of managerial extrapolation formed by using firms' sales or free cash flow to replace indicators based on EPS.

In summary, this thesis provides evidence that managerial extrapolation of past earnings performance into the future can affect managers' dividend decisions. This influence may be trial (see DeAngelo et al. (2009) for a detailed discussion on behaviour factors in explaining dividend policy) but significant and robust during in-sample period from 1963 to 2000 and out-of-sample period from 2001 to 2013, when it is compared with two other types of variables which represent managers' catering incentive to investors and managerial overconfidence, respectively. Managerial extrapolation can be used to explain several payout policy's phenomenon including sharp dividend's decline around 1978, dividend's reappearance around 2002 and fluctuation in the percentage of firms who initiate/continue/increase/pay/omit/decrease dividends.

This thesis develops the hypothesis about the influence of managerial extrapolation on managers' dividend decisions. Based on the methodology of Fama and French (2001) and Baker and Wurgler (2004a), we provide large amount of empirical evidence in this thesis to support the hypothesis. However, there is still plenty of relevant and worthwhile further research being conducted. For example, this thesis does not extend the analysis to include some other possible dividend policy's determinants including firms' lifecycle, firms' leverage and firms' liquidity (see DeAngelo et al., 2006; Baker et al., 2001; Banerjee et al., 2007)[24]. This thesis does not investigate the causes and components of different managerial overconfidence, or it does not discusses further on mixed results of managerial overconfidence on firms' payout policy. There may be other better methods to

[24] We roughly test the robustness of our indicators of managerial extrapolation when these factors are controlled, and our main conclusions hold. However, we do not show and discuss it in this thesis.

evaluate managerial extrapolation into the future, but these will be left for further research.

Appendices

Appendix 3.1 Firm-specific variables

Firm-specific variables

Variable name	Definition	Literature
BE	Book equity is Stockholder’s Equity (DATA216) minus Preferred Stock (DATA10) plus Deferred Taxes and Investment Tax Credit (TXDITC) minus Postretirement Benefit Asset (PRBA). If Stockholder’s Equity (DATA216) is not available, it is replaced by either Common Equity (DATA60) plus Preferred Stock (DATA130), or Total Assets (AT) minus Liabilities (DATA181). If Preferred Stock (DATA10) is not available, it is replaced by either Preferred Stock Redemption Value (DATA56), or Preferred Stock Carrying Value (DATA130).	Same as Baker and Wurgler (2004a)
ME	Market equity at fiscal year-end (DATA199) times common shares outstanding (DATA25). We follow Baker and Wurgler (2004a) to compute the dividend premium using ME at calendar year-end, and use ME at fiscal year-end to compute firm characteristic.	Same as Fama and French (2001), and Baker and Wurgler (2004a)
NYP	Stock exchange percentile is stock market capitalization percentile. It is equal to the percentage of firms having smaller capitalization than firms in all NYSE in fiscal year t. We apply NYSE’s breakpoints to classify firm size in AMEX and NASDAQ market.	Same to Fama and French (2001)
M/B	Market-to-book ratio is book assets (AT) minus book equity plus market equity all divided by book assets (AT).	Same as Fama and French (2001), and Baker and Wurgler (2004a)
ΔA/A	Asset growth is increase rate of assets (AT) from fiscal year *t*-1 to year *t*.	Same as Fama and French (2001), and Baker and Wurgler (2004a)
E/A	Profitability is income before extraordinary items (DATA18) plus interest expense (DATA15) plus deferred taxes (TXDI) divided by total assets (AT).	Same as Baker and Wurgler (2004a)

Appendix 3.1 (continue)		
Sys risk	Systematic risk is the standard deviation of the predicted value from a conventional CAPM for a firm.	Same as Hoberg and Prabhala (2009)
Idi risk	Idiosyncratic risk is the standard deviation of the residuals from a conventional CAPM for a firm.	Same as Hoberg and Prabhala (2009)
$\boldsymbol{VW\ P_t^{D-ND}}$	Book-value-weighted dividend premium is the difference in log of book-value-weighted total market-to-book ratio (*M/B*) for dividend payers and the log of this ratio for nonpayers in the calendar year *t*. The market value in calculating *M/B* here is the fiscal year end market value. $$VW\ \mathrm{P}^{D-ND}{}_t = \log\sum_{i=1}^{m}\upsilon_{i,t}\left(\frac{M}{B}\right)_{i,t}^{payer} - \log\sum_{i=1}^{n}\omega_{i,t}\left(\frac{M}{B}\right)_{i,t}^{non-payer}$$ *where* $\upsilon_{i,t}$ *is the book-value-weight for Payer i in year t, and* $\omega_{i,t}$ *is the book-value-weight for Payer i in year t.*	Same as Baker and Wurgler (2004a)

Appendix 3.2 EPS-related variables

Variable name	Definition
EPSG(1-5)	Dummy of strong 5-year increase in EPS: If a firm's EPS (EPSPX) has kept non-decreasing from year lag_6 to year lag_1 (non-decreasing year by year) for total 5 years, it is defined as the one with 5-year stable EPS increase. Its value is 1, if conditions above could be satisfied, otherwise 0. $EPSG1-5_{i,t}=\begin{cases}1\ if\ EPS_{i,t-1}\geq EPS_{i,t-2}\geq EPS_{i,t-3}\geq EPS_{i,t-4}\geq EPS_{i,t-5}\geq EPS_{i,t-6}\\0\ if\ otherwis\end{cases}$
EPSG(1-3)	Dummy of strong 3-year increase in EPS: If a firm's EPS has kept at least non-decreasing from year lag_4 to year lag_1 (non-decreasing year by year) for total for 3 years, it is defined as the one with 3-year stable EPS increase. Its value is 1, if conditions above could be satisfied, otherwise 0. $EPSG1-3_{i,t}=\begin{cases}1\ if\ EPS_{i,t-1}\geq EPS_{i,t-2}\geq EPS_{i,t-3}\geq EPS_{i,t-4}\\0\ if\ otherwise\end{cases}$
EPSG(1,5)	Dummy of general 5-year increase in EPS: If a firm's EPS in year lag_6 is less than its value in year lag_1, it is defined as the one with an general EPS increase from year lag_6 to year lag_1. The increase could be fluctuating, but it should be an increase in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $EPSG1,5_{i,t}=\begin{cases}1\ if\ EPS_{i,t-1}\geq EPS_{i,t-6}\\0\ if\ otherwise\end{cases}$
EPSG(1,3)	Dummy of general 3-year increase in EPS: If a firm's EPS (EPSPX) in year lag_4 is less than its value in year lag_1, it is defined as the one with an general EPS increase from year lag_4 to year lag_1. The increase could be fluctuating, but it should be an increase in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $EPSG1,3_{i,t}=\begin{cases}1\ if\ EPS_{i,t-1}\geq EPS_{i,t-4}\\0\ if\ otherwise\end{cases}$
EPSG (1-5)	Dummy of strong 5-year decrease in EPS: If a firm's EPS (EPSPX) has kept decreasing from year lag_6 to year lag_1 (decreasing year by year) for total 5 years, it is defined as the one with 5-year stable EPS decrease. Its value is 1, if conditions above could be satisfied, otherwise 0. $EPSG1-5_{i,t}=\begin{cases}1\ if\ EPS_{i,t-1}\leq EPS_{i,t-2}\leq EPS_{i,t-3}\leq EPS_{i,t-4}\leq EPS_{i,t-5}\leq EPS_{i,t-6}\\0\ if\ otherwis\end{cases}$
EPSG (1-3)	Dummy of strong 3-year decrease in EPS: If a firm's EPS has kept at least decreasing from year lag_4 to year lag_1 (decreasing year by year) for total for 3 years, it is defined as the one with 3-year stable EPS decrease. Its value is 1, if conditions above could be satisfied, otherwise 0. $EPSG1-3_{i,t}=\begin{cases}1\ if\ EPS_{i,t-1}\leq EPS_{i,t-2}\leq EPS_{i,t-3}\leq EPS_{i,t-4}\\0\ if\ otherwise\end{cases}$

	Appendix 3.2 (continue)
EPSD(1,5)	Dummy of general 5-year decrease in EPS: If a firm's EPS in year lag_6 is less than its value in year lag_1, it is defined as the one with a general EPS decrease from year lag_6 to year lag_1. The decrease could be fluctuating, but it should be a decrease in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $EPSG1,5_{i,t} = \begin{cases} 1 \ if \ EPS_{i,t-1} \leq EPS_{i,t-6} \\ 0 \ if \ otherwise \end{cases}$
EPSD(1,3)	Dummy of general 3-year decrease in EPS: If a firm's EPS (EPSPX) in year lag_4 is less than its value in year lag_1, it is defined as the one with a general EPS decrease from year lag_4 to year lag_1. The decrease could be fluctuating, but it should be a decrease in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $EPSG1,3_{i,t} = \begin{cases} 1 \ if \ EPS_{i,t-1} \leq EPS_{i,t-4} \\ 0 \ if \ otherwise \end{cases}$

Appendix 3.3 Payout status variables

Variable name	Definition	Literature
Payer	A firm is a dividend payer in fiscal year t if it has positive dividends per share by the ex-date (DATA26) in fiscal year *t*. If a firm is a payer in fiscal year t as defined above, its value is 1 for this variable, otherwise it is 0.	Same as Fama and French (2001), and Baker and Wurgler (2004a)
Nonpayer	A firm is a nonpayer if it does not have positive dividends per share by the ex-date (DATA26) in the fiscal year *t*.[25]	Same as Baker and Wurgler (2004a)
Newpayer	A firm is a new payer if it was a non-payer in fiscal year *t*-1 (survived non-payer in year *t*-1), but it becomes a payer in fiscal year *t*. If a firm is a new payer in fiscal year *t* as defined above, it equals to 1, otherwise it equals to 0. $newpayer_{i,t} = payer_{i,t} \times (1 - payer_{i,t-1})$	Same as Baker and Wurgler (2004a)
Divcontinue	Divcontinue represents a firm who was a dividend payer in fiscal year *t*-1, and it continues to be a payer in fiscal year *t*. If a firm is a divcontinue as defined above, it equals to 1, otherwise it equals to 0. $divcontinue_{i,t} = payer_{i,t} \times payer_{i,t-1}$	Same as Baker and Wurgler (2004a)
Divincrease	Divincrease represents a firm who was a dividend payer in fiscal year *t*-1, and it increases its dividend payment (DATA26) in fiscal year *t*. If a firm is a divincrease as defined above, it equals to 1, otherwise it equals to 0. $Divincrease_{i,t} = \begin{cases} 1 \text{ } if \text{ } DATA26_{i,t} > DATA26_{i,t-1} \\ 0 \text{ } if \text{ } otherwise \end{cases}$	

25 The same as the definition given by Baker and Wurgler (2004a), a firm is a nonpayer, if it is not a payer at year *t*.

	Appendix 3.3 (continue)
Divomission	Divomission represents a firm who was a dividend payer in fiscal year *t*-1, but it becomes a nonpayer in fiscal year *t*. If a firm is a divomission as defined above, it equals to 1, otherwise it equals to 0. $divomission_{i,t} = (1\text{-}payer_{i,t}) \times payer_{i,t-1}$
Divdecrease	Divdecrease represents a firm who was a dividend payer in fiscal year *t*-1, and it decreases its dividend payment in fiscal year *t*. If a firm is a divdecrease as defined above, it equals to 1, otherwise it equals to 0. $Divdecrease_{i,t} = \begin{cases} 1 \text{ } if \text{ } DATA26_{i,t} < DATA26_{i,t-1} \\ 0 \text{ } if \text{ } otherwise \end{cases}$
S5newpayer	Strong new payer S5newpayer is a firm that did not pay dividends over past 5 years, but becomes a dividend payer in fiscal year *t*. Specifically, a strong new payers S5newpayer is defined as: $S5newpayer_{i,t} = newpayer_{i,t} \times \prod_{k=1}^{5}(1 - payer_{i,t-k})$
S3newpayer	Strong new payer S3newpayer is a firm that did not pay dividends over past 3 years, but becomes a dividend payers in fiscal year *t*. Specifically, a strong new payers S3newpayer is defined as: $S3newpayer_{i,t} = newpayer_{i,t} \times \prod_{k=1}^{3}(1 - payer_{i,t-k})$

Appendix 5.1 Firm-specific variables

Variable name	Definition	Literature
Sales	*Sales* equals to total sales (*SALE)* divided by property, plants, and equipment (*PPENT*) at the end of last fiscal year/	Same as Lakonishok, Shleifer, and Vishny (1994)
FCF	*FCF* is a firm's free cash flow which equals to operating income before depreciation (*OIBDP*) minus depreciation (*DP*), income tax (*TXT*), interest and related expense (XINT), and preferred dividends (*DVP*) all divided by total asset (*AT*).	Similar to Kulchania, but we add common dividends (DVC) back

Appendix 5.2 Alternative indicators of firms' past performance

Variable name	Definition
SaleG(1-5)	Dummy of strong 5-year increase in sales: If a firm's *sales* ($SALE/PPENT_{t-1}$) has kept non-decreasing from fiscal year t-6 to fiscal year t-1 (non-decreasing year by year) for total 5 years, it is defined as the one with 5-year stable sales increase in fiscal year t. Its value is 1, if conditions above could be satisfied, otherwise 0. $SALEG(1-5)_{i,t} = \begin{cases} 1 \ if \ sales_{i,t-1} \geq sales_{i,t-2} \geq sales_{i,t-3} \geq sales_{i,t-4} \geq sales_{i,t-5} \geq sales_{i,t-6} \\ 0 \ if \ otherwis \end{cases}$
SaleG(1-3)	Dummy of strong 3-year increase in sales: If a firm's sales has kept at least non-decreasing from fiscal year t-4 to fiscal year t-1 (non-decreasing year by year) for total for 3 years, it is defined as the one with 3-year stable sales increase in fiscal year t. Its value is 1, if conditions above could be satisfied, otherwise 0. $SALEG(1-3)_{i,t} = \begin{cases} 1 \ if \ sales_{i,t-1} \geq sales_{i,t-2} \geq sales_{i,t-3} \geq sales_{i,t-4} \\ 0 \ if \ otherwise \end{cases}$
SaleG(1,5)	Dummy of general 5-year increase in sales: If a firm's sales in fiscal year t-6 is less than its value in fiscal year t-1, it is defined as the one with an general sales increase from fiscal year t-6 to fiscal year t-1. The increase could be fluctuating, but it should be an increase in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $SALEG(1,5)_{i,t} = \begin{cases} 1 \ if \ sales_{i,t-1} \geq sales_{i,t-6} \\ 0 \ if \ otherwise \end{cases}$
SaleG(1,3)	Dummy of general 3-year increase in sales: If a firm's sales in fiscal year t-4 is less than its value in fiscal year t-1, it is defined as the one with an general sales increase from fiscal year t-4 to fiscal year t-1. The increase could be fluctuating, but it should be an increase in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $EPSG(1,3)_{i,t} = \begin{cases} 1 \ if \ sales_{i,t-1} \geq sales_{i,t-4} \\ 0 \ if \ otherwise \end{cases}$

Appendix 5.2 (continue)	
SaleD (1-5)	Dummy of strong 5-year decrease in sales: If a firm's sales has kept decreasing from fiscal year t-6 to fiscal year t-1 (decreasing year by year) for total 5 years, it is defined as the one with 5-year stable sales decrease in fiscal year t. Its value is 1, if conditions above could be satisfied, otherwise 0. $SALED(1-5)_{i,t} = \begin{cases} 1 \ if \ sales_{i,t-1} \leq sales_{i,t-2} \leq sales_{i,t-3} \leq sales_{i,t-4} \leq sales_{i,t-5} \leq sales_{i,t-6} \\ 0 \ if \ otherwis \end{cases}$
SaleD (1-3)	Dummy of strong 3-year decrease in sales: If a firm's sales has kept at least decreasing from fiscal year t-4 to fiscal year t-1 (decreasing year by year) for total for 3 years, it is defined as the one with 3-year stable sales decrease in fiscal year t. Its value is 1, if conditions above could be satisfied, otherwise 0. $SALED(1-3)_{i,t} = \begin{cases} 1 \ if \ sales_{i,t-1} \leq sales_{i,t-2} \leq sales_{i,t-3} \leq sales_{i,t-4} \\ 0 \ if \ otherwise \end{cases}$
SaleD(1,5)	Dummy of general 5-year decrease in sales: If a firm's sales in fiscal year t-6 is less than its value in fiscal year t-1, it is defined as the one with a general sales decrease from fiscal year t-6 to fiscal year t-1. The decrease could be fluctuating, but it should be a decrease in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $SALED(1,5)_{i,t} = \begin{cases} 1 \ if \ sales_{i,t-1} \leq sales_{i,t-6} \\ 0 \ if \ otherwise \end{cases}$
SaleD(1,3)	Dummy of general 3-year decrease in sales: If a firm's sales in fiscal year t-4 is less than its value in fiscal year t-1, it is defined as the one with a general sales decrease from fiscal year t-4 to fiscal year t-1. The decrease could be fluctuating, but it should be a decrease in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $SALED(1,3)_{i,t} = \begin{cases} 1 \ if \ sales_{i,t-1} \leq sales_{i,t-4} \\ 0 \ if \ otherwise \end{cases}$

Appendix 5.2 (continue)

FCFG(1-5)	Dummy of strong 5-year increase in sales: If a firm's *FCF* ((*OIBDP-DP-TXT-XINT-DVP)/AT*) has kept non-decreasing from fiscal year t-6 to fiscal year t-1 (non-decreasing year by year) for total 5 years, it is defined as the one with 5-year stable sales increase in fiscal year t. Its value is 1, if conditions above could be satisfied, otherwise 0. $FCFG(1-5)_{i,t} = \begin{cases} 1 \; if \; FCF_{i,t-1} \geq FCF_{i,t-2} \geq FCF_{i,t-3} \geq FCF_{i,t-4} \geq FCF_{i,t-5} \geq FCF_{i,t-6} \\ 0 \; if \; otherwis \end{cases}$
FCFG(1-3)	Dummy of strong 3-year increase in *FCF*: If a firm's *FCF* has kept at least non-decreasing from fiscal year t-4 to fiscal year t-1 (non-decreasing year by year) for total for 3 years, it is defined as the one with 3-year stable *FCF* increase in fiscal year t. Its value is 1, if conditions above could be satisfied, otherwise 0. $FCFG(1-3)_{i,t} = \begin{cases} 1 \; if \; FCF_{i,t-1} \geq FCF_{i,t-2} \geq FCF_{i,t-3} \geq FCF_{i,t-4} \\ 0 \; if \; otherwise \end{cases}$
FCFG(1,5)	Dummy of general 5-year increase in *FCF*: If a firm's *FCF* in fiscal year t-6 is less than its value in fiscal year t-1, it is defined as the one with an general FCF increase from fiscal year t-6 to fiscal year t-1. The increase could be fluctuating, but it should be an increase in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $FCFG(1,5)_{i,t} = \begin{cases} 1 \; if \; FCF_{i,t-1} \geq FCF_{i,t-6} \\ 0 \; if \; otherwise \end{cases}$
FCFG(1,3)	Dummy of general 3-year increase in *FCF*: If a firm's *FCF* in fiscal year t-4 is less than its value in fiscal year t-1, it is defined as the one with an general FCF increase from fiscal year t-4 to fiscal year t-1. The increase could be fluctuating, but it should be an increase in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $FCFG(1,3)_{i,t} = \begin{cases} 1 \; if \; FCF_{i,t-1} \geq FCF_{i,t-4} \\ 0 \; if \; otherwise \end{cases}$

	Appendix 5.2 (continue)
FCFD (1-5)	Dummy of strong 5-year decrease in *FCF*: If a firm's *FCF* has kept decreasing from fiscal year t-6 to fiscal year t-1 (decreasing year by year) for total 5 years, it is defined as the one with 5-year stable FCF decrease in fiscal year t. Its value is 1, if conditions above could be satisfied, otherwise 0. $FCFD(1-5)_{i,t}=\begin{cases}1\ if\ FCF_{i,t-1}\le FCF_{i,t-2}\le FCF_{i,t-3}\le FCF_{i,t-4}\le FCF_{i,t-5}\le FCF_{i,t-6}\\0\ if\ otherwis\end{cases}$
FCFD (1-3)	Dummy of strong 3-year decrease in *FCF*: If a firm's *FCF* has kept at least decreasing from fiscal year t-4 to fiscal year t-1 (decreasing year by year) for total for 3 years, it is defined as the one with 3-year stable FCF decrease in fiscal year t. Its value is 1, if conditions above could be satisfied, otherwise 0. $FCFD(1-3)_{i,t}=\begin{cases}1\ if\ FCF_{i,t-1}\le FCF_{i,t-2}\le FCF_{i,t-3}\le FCF_{i,t-4}\\0\ if\ otherwise\end{cases}$
FCFD(1,5)	Dummy of general 5-year decrease in *FCF*: If a firm's *FCF* in fiscal year t-6 is less than its value in fiscal year t-1, it is defined as the one with a general FCF decrease from fiscal year t-6 to fiscal year t-1. The decrease could be fluctuating, but it should be a decrease in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $FCFD(1,5)_{i,t}=\begin{cases}1\ if\ FCF_{i,t-1}\le FCF_{i,t-6}\\0\ if\ otherwise\end{cases}$
FCFD(1,3)	Dummy of general 3-year decrease in *FCF*: If a firm's *FCF* in fiscal year t-4 is less than its value in fiscal year t-1, it is defined as the one with a general FCF decrease from fiscal year t-4 to fiscal year t-1. The decrease could be fluctuating, but it should be a decrease in total. Its value is 1, if conditions above could be satisfied, otherwise 0. $FCFD(1,3)_{i,t}=\begin{cases}1\ if\ FCF_{i,t-1}\le FCF_{i,t-4}\\0\ if\ otherwise\end{cases}$

Appendix 5.3 Alternative measurements for managerial overconfidence

Firm-specific variables

Variable name	Definition	Literature
Highopt	A firm's *Highopt* CEO should hold higher than 100% in-the-money options. The moneyness of an option for a *Highopt* CEO is calculated as the unit value of unexercised exercisable options (*OPT_UNEX_EXER_EST_VAL/OPT_UNEX_EXER_NUM*) divided by the average exercise price (*PRCC_F-(OPT_UNEX_EXER_EST_VAL/OPT_UNEX_EXER_NUM)*). A CEO can only be defined as *Highopt* one when he (she) shows at least twice such option-holding activities during the sample period (recorded as *Highopt* CEO from the first time).	Same as Campbell et al. (2011)
Lowopt	A firm's *Lowopt* CEO should exercise lower than 30% in-the-money options. The moneyness of an option for a *Lowopt* CEO is calculated as the unit value of exercised options (*OPT_EXER_VAL/OPT_EXER_NUM*) divided by the average exercise price (*PRCC_F-(OPT_EXER_VAL/OPT_EXER_NUM)*). A CEO can only be defined as Highopt one when he(she) shows at least twice such option-holding activities during the sample period (recorded as *Highopt* CEO from the first time), and does not hold any unexercised exercisable option which is more than 30% in-the-money. The function of calculating moneyness of unexercised exercisable option is above in *Highopt*.	Same as Campbell et al. (2011)
Highinvest	A firm with *Highinvest* CEO should have investment rate which is at the top quintile of firms in the same industry for at least two consecutive years. The investment rate is calculated as capital expenditure (*CAPX*) divided by property, plants, and equipment (*PPENT*) at last fiscal year end.	Same as Campbell et al. (2011)
Lowinvest	A firm with *Lowinvest* CEO should have investment rate which is at the bottom quintile of firms in the same industry for at least two consecutive years. The investment rate is calculated as capital expenditure (*CAPX*) divided by property, plants, and equipment (*PPENT*) at last fiscal year end.	Same as Campbell et al. (2011)

	Appendix 5.3 (continue)	
Highnet	A firm's *Highnet* CEO should increase his (her) shares owned excluding options (*SHROWN_EXCL_OPTS*) on this firm by more than 10% from last fiscal year to current fiscal year, and also is ranked at the top quintile among all CEO in this increase rate of shares owned. We exclude the first time when this classification appears, and repeat the analysis.	Similar to Campbell et al. (2011), but we use shares owned excluding options to proxy for CEO's net-buying activities.
Lownet	A firm's *Lownet* CEO should decrease his (her) shares owned excluding options (*SHROWN_EXCL_OPTS*) on this firm by more than 10% from last fiscal year to current fiscal year, and also is ranked at the bottom quintile among all CEO in this increase rate of shares owned. We exclude the first time when this classification appears, and repeat the analysis.	Similar to Campbell et al. (2011), but we use shares owned excluding options to proxy for CEO's net-buying activities.

References

Acharya, V., and Pedersen, L., 2005, Asset pricing with liquidity risk, *Journal of Financial Economics* 77, 375–410.

Ahmad, Gatot Nazir and Vina Knsuma Wardani, 2014, The effect of fundamental factor to dividend policy: evidence in Indonesia stock exchange, *International Journal of Business and Commerce* 4 (2), 14.

Ahmed, H., and Javid, A., 2009, Dynamics and determinants of dividend policy in Pakistan: Evidence from Karachi stock exchange non-financial listed firms, International Research *Journal of Finance and Economics* 29, 110–125.

Ahmed, Anwer S., and Scott Duellman, 2013, Managerial Overconfidence and Accounting Conservatism, *Journal of Accounting Research* 51 (1), 1-30.

Alti, Aydogan and Paul C. Tetlock, 2014, Biased beliefs, asset prices, and investment: A structural approach, *The Journal of Finance* 69 (1), 325-361.

Amidu, Mohammed, Joshua Abor, 2006, Determinants of dividend payout ratios in Ghana, *The Journal of Risk Finance* 7 (2), 136 – 145.

Amihud, Y. and H. Mendelson, 1986, Asset pricing and the bid-ask spread, *Journal of Financial Economics* 17, 223–249.

Amihud, Yakov, 2002, Illiquidity and stock returns: cross-section and time-series effects, *Journal of Financial Markets* 5, 31–56.

Arnott, Robert D., and Clifford S. Asness, 2003, Surprise! Higher dividends = higher earnings growth, *Financial Analysts Journal* 59, 70–87.

Avery, Christopher and Judith Chevalier, 1999, Identifying investor sentiment from price paths: the case of football betting, *Jounal of Business* 72 (4), 493-521.

Baker, H. Kent, Gail E. Farrelly, and Richard B. Edelman, 1972 A Survey of Management Views on Dividend Policy, *Financial Management* 14, 78-84.

Baker, H. Kent, Gary E. Powell, E. and Theodore Veit, 2001, Factors influencing dividend policy decisions of Nasdaq Firms, *Financial Review* 36, 19-38.

Baker, Malcolm, and Jeffrey Wurgler, 2004a, A catering theory of dividends, *Journal of Finance* 59, 1125-1165.

Baker, Malcolm, and Jeffrey Wurgler, 2004b, Appearing and disappearing dividends: The link to catering incentives, *Journal of Financial Economics* 73, 271–288.

Baker, Malcolm, and Jeffrey Wurgler, 2013, Behavioral Corporate Finance: An Updated Survey", *Handbook of the Economics of Finance*, Vol. 2, ed. G Constantinides, M Harris, R Stulz. Amsterdam: Elsevier. .

Baker, M., and Stein, J., 2004, Market liquidity as a sentiment indicator, *Journal of Financial Markets* 7, 271–299.

Banerjee, Suman, Vladimir A. Gatchev, and Paul A. Spindt, 2007, Stock market liquidity and firm dividend policy, *Journal of Financial and Quantitative Analysis* 42, 369–398.

Banerjee, Suman, Mark Humphery-Jenner, and Vikram K. Nanda, 2013, CEO Overconfidence and Share Repurchases, *26th Australasian Finance and Banking Conference*, UNSW Australian School of Business Research Paper No. 2013 BFIN 04.

Barberis, Nichals. 2011. “Psychology and the Financial Crisis of 2007–2008.” Available at SSRN: <http://ssrn.com/abstract=1742463>.

Barberis, Nicholas and Andrei Shleifer, 2003, Style investing, *Journal of Financial Economics* 68, 161-199.

Barberis, Nicholas, Andrei Shleifer and Robert Vishny, 1998, A model of investor sentiment, *Journal of Financial Economics* 49, 307-343.

Barth, Mary E., John A. Elliott, and Mark W Finn, 1999, Market Rewards Associated with Patterns of Increasing Earnings, *Journal of Accounting Research* 37, 387-413.

Ben-David, Itzhak., John R. Graham, and Campbell R. Harvey, 2007, Managerial Overconfidence and Corporate Policies, *Working Paper*, Duke University.

Ben-David, Itzhak and Graham, John R. and Harvey, Campbell R., 2013, Managerial Miscalibration, *Quarterly Journal of Economics*, 128 (4), 1547.

Benartzi, Shlomo, Roni Michaely, and Richard Thaler, 1997, Do changes in dividends signal the future or the past? *Journal of Finance* 52, 1007-1034.

Bhattacharya, Sudipto, 1979, Imperfect information, dividend policy, and ‘the bird in the hand fallacy’, *Bell Journal of Economics* 10, 259-270.

Billett, Matthew T. and Yiming Qian, 2008, Are Overconfident CEOs Born or Made? Evidence of Self-Attribution Bias from Frequent Acquirers, *Management Science* 54 (6), 1037-1051.

Bradshaw, Mark, Michael Drake, James Myers, and Linda Myers, 2012, A re-examination of analysts' superiority over time-series forecasts of annual earnings, *Review of Accounting Studies* 17, 944-968.

Brav, Alon, John R. Graham, Campbell R. Harvey and Roni Michaely, 2005, Payout Policy In The 21st Century, *Journal of Financial Economics* 77(3), 483-527.

Brennan, M. (1970). Taxes, Market Valuation and Financial Policy. *National Tax Journal*, 23, pp.417-429.

Bulan, Laarni, Narayanan Subramanian, and Lloyd Tanlu, 2007, On the timing of dividend initiation, *Financial Management* 36, 31-65.

Butler, A., G. Grullon, and J. Weston, 2006, Can Managers Forecast Aggregate Returns?, *Journal of Finance* 60, 963–86.

Campbell, T. Colin, Michael Gallmeyer, Shane A. Johnson, Jessica Rutherford, and Brooke W. Stanley, 2011, CEO optimism and forced turnover, *Journal of Financial Economics* 101, 695-712.

Campello, M., Graham, J.R. & Campell, C.R. (2009). The real effects of financial constraints: Evidence from a financial crisis. *Journal of financial economics* 97 (3), 470-487.

Chan, Louis K. C., Jason Karceski, and Josef Lakonishok, 2003, The Level and Persistence of Growth Rates, *Journal of Finance* 58, 643-684.

Charitou, Andreas, 2000, The impact of losses and cash flows on dividends: empirical evidence for Japan, *Abacus* 36 (2).

Charitou, Andreas, Neophytos Lambertides, and Giorgos Theodoulou, 2010, The Effect of Past Earnings and Dividend Patterns on the Information Content of Dividends When Earnings Are Reduced, *Abacus* 46, 153-187.

Conlin, M., O'Donoghue, T., and Vogelsang, T.J., 2007, Projection Bias in Catalog Orders, *American Economic Review*, 97(4), 1217–49.

Cordeiro, Leonardo, 2009, Managerial overconfidence and dividend policy, *Working paper*, London Business School.

D'Avolio Gene, 2002, The market for borrowing stock, *Journal of Financial Economics* 66, 271-306.

Daniel, Kent, David Hirshleifer, Avanidhar Subrahmanyam, 1998, Investor psychology and security market under- and overreactions, *Journal of Finance* 53, 1839–1885.

De Bondt, Werner F. M. and Richard Thaler, 1985, Does the Stock Market Overreact?, *The Journal of Finance* 40 (3), 793-805.

DeAngelo, Harry, Linda DeAngelo, and Douglas J. Skinner, 1992, Dividends and Losses, *Journal of Finance* 47, 1837-1863.

DeAngelo, H., L. DeAngelo, and D. J. Skinner, 1996, Reversal of fortune: Dividend signalling and the disappearance of sustained earnings growth. *Journal of Financial Economics* 40 (March), 341–71.

DeAngelo, Harry, Linda DeAngelo, and Douglas J. Skinner, 2004, Are dividends disappearing? Dividend concentration and the consolidation of earnings, *Journal of Financial Economics* 72, 425–456.

DeAngelo, Harry, Linda DeAngelo, and René M. Stulz, 2006, Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory, *Journal of Financial Economics* 81, 227-254.

DeAngelo, Harry, Linda DeAngelo, and Douglas J. Skinner, 2008, Corporate payout policy, *Foundations and Trends in Finance* 3, 95-287.

De Long, J. B., Shleifer, A., Summers, L. H., & Waldmann, R. (1990). Noise trader risk in financial markets, *Journal of Political Economy*, 98, 703–738.

DellaVigna, Stefano, 2009, Psychology and Economics: Evidence from the Field, *Journal of Economic Literature* 47(2), 315-72.

Denis, David J., and Igor Osobov, 2008, Why do firms pay dividends? International evidence on thedeterminants of dividends policy, *Journal of Financial Economics* 89, 62-82.

Deshmukh, Sanjay, Anand M. Goel, and Keith M. Howe, 2013, CEO overconfidence and dividend policy, *Journal of Financial Intermediation*, 440-463.

Dittmar Amy K., 2000, Why do firms repurchase stock?, *Journal of Business*, 73, 331-355.

Dittmar, Amy K., and Robert F. Dittmar, 2004, Stock repurchase waves: An explanation of the trends in aggregate corporate payout policy, *Working paper*, University of Michigan.

Eriotis, N., 2005, The Effect Of Distributed Earnings And Size Of The Firm To Its Dividend Policy: Some Greek Data, *International Business and Economics Journal* 4 (1), 45–51.

Fama, Eugene F., and Kenneth R. French, 2001, Disappearing dividends: Changing firm characteristics or lower propensity to pay?, *Journal of Financial Economics* 60, 3-40.

Easterbrook, F.H. (1984). Two Agency-cost Explanations on Dividends. *American Economic Review*, 74, September, pppp220- 230.

Ferris, S., R. Haugen, A. Makhija., 1988. Predicting contemporary volume with historic volume at differential price levels: Evidence supporting the disposition effect, *Journal of Finance* 43(3) 677–697.

Finger, C.A., 1994, The ability of earnings to predict future earnings and cash flow, *Journal of Accounting Research* 32, 210-223.

Floyd, E., N. Li and D.J. Skinner (2014) Payout policy through the financial crisis: The growth of repurchases and the resilience of dividends, *Chicago Booth Research Paper* No. 12-01.

Gao, X., & Ritter, J. (2010). The marketing of seasoned equity offerings, *Journal of Financial Economics,* 97, 33–52.

Gervais, Simon, J.B. Heaton, and Terrance Odean, 2011, Overconfidence, compensation contracts, and capital budgeting, *Journal of Finance* 66 (3), 1735–1777.

Gordon, Myron J., 1959, Dividends, earnings and stock prices, *Review of Economics and Statistics* 41(2), 99–105.

Goyal, A. (2012). Empirical cross-sectional asset pricing: A survey. *Financial Markets and Portfolio Management* 26, 3-28.

Greenwood, Robin, and Samuel G. Hanson, 2013, Issuer Quality and Corporate Bond Returns, *Review of Financial Studies* 26 (6), 1483–1525.

Greenwood, R., Hanson, S., and Stein, J. C, 2010, A gap-filling theory of corporate debt maturity choice, *Journal of Finance* 65, 993–1028.

Grether, David M., 1980, Bayes rule as a descriptive model: The representativeness heuristic, *The Quarterly Journal of Economics* 95 (3), 537-557.

Grullon, Gustavo, Roni Michaely and Bhaskaran Swaminathan, 2002, Are Dividend Changes a Sign of Firm Maturity?, *Journal of Business* 75 (2002), 387-424.

Guttman, Ilan, Ohad Kadan, and Eugene Kandel, 2010, Dividend stickiness and strategic pooling, *Review of Financial Studies* 23, 4455-4495.

Gwilym, Owain Ap, James Seaton, Karina Suddason, and Stephen Thomas, 2006, International evidence on the payout ratio, earnings, dividends and returns, *Financial Analysts Journal* 62, 36–53.

Hauser, Richard (2013) Did dividend policy change during the financial crisis?, *Managerial Finance*, 39(6), 584 – 606.

Heaton, J. B., 2002, Managerial optimism and corporate finance, *Financial Management* 31, 33–45.

Hilary, Gilles and Charles Hsu, 2011, Endogenous overconfidence in managerial forecasts, *INSEAD Working Papers Collection* 39.

Hirshleifer, David, Angie Low, Li, Jun and Yu, Jianfeng, 2015, Asset Pricing in Production Economies with Extrapolative Expectations, *Journal of Monetary Economics*, Forthcoming.

Hirshleifer, David., Angie Low, and Siew Teoh, 2012, Are Overconfident CEOs Better Innovators? *Journal of Finance* 67, 1457–98.

Hoberg, Gerard, and Nagpurnanand R. Prabhala, 2009, Disappearing Dividends, Catering, and Risk, *Review of Financial Studies* 22, 79-116.

Holder, M.E., F.W. Langrehr and J.L. Hexter, 1998, Dividend policy determinants: An investigation of the influences of stakeholder theory, *Financial Management*, 27(3), 73-82.

Hribar, Paul and Holly Yang, 2015, CEO Overconfidence and Management Forecasting, *Contemporary Accounting Research*, Forthcoming.

Huddart, S., Lang, M., and Yetman, M. H., 2009, Volume and price patterns around a stock's 52-week highs and lows: Theory and evidence. *Management Science* 55, 16–31.

Jagannathan, Murray, Clifford P. Stephens, and Michael S. Weisbach, 2000, Financial flexibility and the choice between dividends and stock repurchases, *Journal of Financial Economics* 57, 355-384.

Jensen, Michael C., 1986, Agency costs of free cash flow, corporate finance and takeovers, *American Economic Review* 76, 323–329.

Jiang, Zhan, Kenneth A. Kim, Erik Lie, and Sean Yang, 2013, share repurchases, catering, and dividend substitution, *Journal of Corporate Finance* 21, 36-50.

Julio, Brandon and David L. Ikenberry, 2004, Reappearing dividends, *Journal of Applied Corporate Finance* 16 (4), 89-100.

Jullisson, E. Asgeir, Niklas Karlsson, and Tommy Garling, 2005, Weighing the past and the future in decision making, *European Journal of Cognitive Psychology* 17(4), 561-57.

Koch, Adam S., and Amy X. Sun, 2004, Dividend Changes and the Persistence of Past Earnings Changes, *Journal of Finance* 59, 2093-2116.

Kothari, S. P., 2001, Capital markets research in accounting, *Journal of Accounting and Economics* 31(1–3), 105–231.

Kulchania, Manoj, 2013, Catering driven substitution in corporate payouts, *Journal of Corporate Finance* 21, 180-195.

Kuo, Jing-Ming, Dennis Philip, and Qingjing Zhang, 2013, What drives the disappearing dividends phenomenon?, *Journal of Banking and Finance* 37 (9), 3499-3514.

La Porta, Rafael, 1996, Expectations and the cross-section of expected returns, *Journal of Finance* 51, 1715−1742.

Lakonishok, Josef, Andrei Shleifer, and Robert W. Vishny, 1994, Contrarian investment, extrapolation, and risk, *Journal of Finance* 49, 1541-1578.

Lintner, John, 1956, Distribution of incomes of corporations among dividends, retained earnings, and taxes, *American Economic Review* 46, 97-113.

Li, Wei and Erik Lie, 2006, Dividend changes and catering incentive, *Journal of Financial Economics* 80 (2), 293-308.

Libby, Robert, and Kristina Rennekamp, 2012, Self-Serving Attribution Bias, Overconfidence, and the Issuance of Management Forecasts, *Journal of Accounting Research* 50, 197–231.

Litzenberger, R. H. and Ramaswamy, K. (1979). The Effects of Personal Taxes and Dividends on Capital Assets Prices: Theory and Empirical Evidence. *Journal of Financial Economics*, 7, pp.163-195.

Liu, Wei, 2006, A Liquidity-Augmented Capital Asset Pricing Model, *Journal of Financial Economics* 82, 631-671.

Loewenstein, G., O'Donoghue, T., and Rabin, M., 2003, Projection Bias in Predicting Future Utility, *Quarterly Journal of Economics* 118(4), 1209-1248.

Malmendier, Ulrike, and Geoffrey Tate, 2005, CEO Overconfidence and Corporate Investment, *Journal of Finance* 60, 2661-2700.

Malmendier, Ulrike. and Geoffrey Tate, 2008, Who makes Acquisitions? CEO overconfidence and the market's reaction, *Journal of Financial Economics* 89, 20-43.

Malmendier, Ulrike, Geoffrey Tate, and Jon Yan, 2011, Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies, *Journal of Finance* 66(5), 1687-1733.

Maksy, Mostafa M. and Gary T. Chen, 2012, Which free cash flow is value relevant: The case of the Energy Industry, *Journal of Finance and Accountancy* 14.

McLean, R. David, and Mengxin Zhao, 2014, The business cycle, investor sentiment, and costly external finance, *Journal of Finance* 69, 1377-1409.

Mikhail, Michael B., Beverly R. Walther, and , Richard H. Willis, 2003, Reactions to Dividend Changes Conditional on Earnings Quality, *Journal of Accounting, Auditing and Finance* 18, 121-151.

Miller, Merton H. and Kevin Rock, 1985, Dividend Policy under Asymmetric Information, *The Journal of Finance* 40 (4), 1031-1051.

Miller, M.H. and Modigliani, F., 1961, Dividend policy, growth, and thevaluation of shares, *Journal of Business* 34, 411–433.

Miller, E. M., 1977, Risk. uncertainty, and divergence of opinion. *Journal of Finance* 32, 1151–1168.

Modigliani, F. and Miller, M. (1958). The cost of capital, corporation finance, and the theory of investment. *American economic Review* 48, June, 261-197.

Modigliani, F. and Miller, M. (1963). Corporate income taxes and the cost of capital: A correction. *American economic Review*, June, 433-443.

Moore, Don A., and Paul J. Healy. 2008. The Trouble with Overconfidence, *Psychological Review* 115(2), 502-17.

Myers, Stewart, 1984, The capital structure puzzle, *Journal of Finance* 39, 575–592.

Oskamp, Stuart, 1965, Overconfidence in case-study judgments, *Journal of Consulting Psychology* 29 (3), 261–265.

Petersen, M. 2004. Information: Hard and Soft, *Mimeo*, Northwestern University.

Pontiff, Jeffrey., 1996, Costly arbitrage: Evidence from closed-end funds, *Quarterly Journal of Economics* 111, 1135–1151.

Pruitt, Stephen W., and J. Gitman Lawrence, 1991, The interactions between the investment, financing, and dividend decisions of major U.S. firms, *Financial Review* 26, 409-430.

Reddy, Y. Subba and Subhrendu Rath, 2005, Disappearing dividends in emerging markets?: evidence from India, *Emerging markets finance and trade* 41 (6), 58-82.

Seyhun, H. N., 1992, Why does aggregate insider trading predict future stock returns?, *Quarterly Journal of Economics* 107, 1303–1331.

Shefrin, Hersh M., and Meir Statman, 1984, Explaining investor preference for cash dividends, *Journal of Financial Economics* 13(2), 253−282.

Shefrin, H., M. Statman, 1985, The disposition to sell winners early and ride losers too long: Theory and evidence, *Journal of Finance* 40(3), 777–790.

Shiller, Robert J., 1979, Do stock prices move too much to be justified by subsequent changes in dividends?, *American Economic Review* 71, 421-436.

Shleifer, A., and Vishny, R., 1997, The limits of arbitrage, *Journal of Finance*, 52, 35–56.

Thaler, Richard H., and Hersh M. Shefrin, 1981, An economic theory of self-control, *Journal of Political Economy* 89 (2), 392–406.

Tversky, Amos and Daniel Kahneman, 1974, Judgment under uncertainty: heuristics and biases, *Science* 185, 1124-1131.

Williams, John Burr, 1938, The theory of investment value, *Amsterdam*: North-Holland.

Wu, Chen-Hui, and Victor W. Liu, 2011, Payout Policy and CEO Overconfidence, *Working Paper*, National Sun Yat-sen University.

Wurgler, Jeffrey and Ekaterina Zhuravskaya, 2002. Does Arbitrage Flatten Demand Curves for Stocks?, *The Journal of Business*, University of Chicago Press 75(4), 583-608.

Zhou, Ping, and William Ruland, 2006, Dividend payouts and future earnings growth, *Financial Analysts Journal* 62, 58–69.