Three Essays in Corporate Finance. New evidence from the UK on the impact of Institutional Investors' Investment Horizon

By

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A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

Norwich Business School

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November 2020

Declaration

I confirm that this is my own work and the use of all material from sources has been properly and fully acknowledged.

Signed: Abdulaziz Ahmed A. Alomran 

Date: 20/11/2020

To

My masters: mother (Ibtisam) and father (Ahmed);

my close friend, PhD-mate, and wife (Kholod);

my brother (Azaam) and sister (Nora);

my princess (Reema) and little man (Ahmed).

Acknowledgements

I am deeply glad for undertaking a PhD journey during my life; mine has been insightful and hopefully fruitful for the next journeys to come. All praise to Allah!

I am deeply grateful for my supervisors, Dr Francesca Cuomo, Professor Anastasiya Shamshur and Professor Andrea Patacconi for their continuous guidance and invaluable comments and insights. The experience would have been intractable without their unlimited encouragement. I am indebted to Dr Francesca for her continuous support throughout my journey. She has always been there for me. Beside many valuable things, I have learned from her how someone can be passionate about their field of research and deeply understand the fundamentals rather than just the surface. She has encouraged me and provided me with many resources - books, websites, and courses to attend - to broaden my theoretical and practical comprehension of my research interests and other related issues. I am also very grateful to my second supervisor Professor Anastasiya who was not only a central person for my doctoral studies but also kindly willing to help even when she moved to the University of Kent at the end of my third year. I also wish to sincerely thank my third supervisor, Professor Andrea, for enriching the supervisory meetings with challenging discussion and beneficial critical thinking.

I am beholden to my parents for their continual prayers and overwhelming love that has strengthened me during this journey. I will never forget my mother's every-Saturday video call. This accomplishment would not be possible without my second half, my wife. During my first year of study in the UK, she bravely stood alone 3000 miles away with my child, soon to become children, as she gave birth to my second child during that year. When she later joined me here as not only my house-mate but also my PhD-mate, she kept providing generous support and selfless sacrifices.

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Introduction

Since the seminal paper of Berle and Means (1932) on the separation between ownership and control of modern corporations and followed by the work by Jensen and Meckling (1976) on the agency costs related to such separation, the academic research pays special attention on the effect of ownership structure on corporate finance and governance. Boyd and Solarina (2016) conduct a 30-year (1980-2013) review of management and finance studies that focus on corporate ownership structure and document that institutional ownership is the most frequently studies type of ownership. Resent research on the corporate ownership structure focuses on institutional investors due to their dominate role in the financial markets and their effective role as external corporate mechanism (Gillan and Starks, 2003).

Moreover, institutional ownership has been increasing in many countries around the world for the past six decades. For instance, recent evidence shows that the total financial assets held by institutional investors increased from 79% of gross domestic product (GDP) to 413% between 1960 and 2016 (OECD, 2017). Nowadays institutional investors have become particularly important shareholders in Anglo-American countries (Blume and Keim, 2017; Mallin, 2018). Institutional investors are not only large but also sophisticated shareholders who have the power to determine the strategy of the firm (Thomsen and Pedersen, 2000; Gillan and Starks, 2003; Tihanyi et al., 2003) and therefore the firm's outcome [for a recent review, see Goranova and Ryan (2014)].

Institutional investors are 'very heterogeneous and have different governance structures and regulatory requirements' (Boyd and Solarina, 2016, p.1284); thus, they have different abilities and incentives to monitor and emergent with their investee firms. A common distinction between institutional investors that recent research focuses on is the investment horizon of these investors. A recent survey of institutional investors by McCahery, Sautner and Starks (2016) highlights that institutional investors with a longer investment horizon tend to monitor the management of their investee firms using the several tools at their disposal more than their short-term counterparts. Prior studies argue that these investors as rational shareholders have the bigger incentive to effectively monitor their investee firms on an ongoing basis to maximize long-run value [see for example, Bushee (2001), Chen, Harford and Li (2007), Froot, Perold and Stein (1992), Gaspar, Massa and Matos (2005) and Harford, Kecskés and Mansi (2018)]. Consequently, this thesis focuses on the role of institutional investors with long-term investment horizon on corporate finance and corporate governance using a

comprehensive dataset of all public firms traded on the London Stock Exchange over the period from 2000 to 2016.

The UK provides an interesting country context for studying institutional investors because the level of institutional ownership in the UK is one of the highest in the world (Ferreira and Matos, 2008). Also, while the US and UK share many similarities in governance systems (i.e., a common law system and high protection of minority rights), important differences include the role and rights of institutional investors and the nature of corporate governance reforms. The UK corporate governance system is often described as being shareholder-led. Contrary to the US's regulator-led approach, it gives shareholders the independence of deciding which monitoring strategy to employ to protect their interests. In the UK, regulators and policymakers tend to empower shareholders to engage with their investee firms, which can be clearly seen through shareholder rights granted by corporate law (Davies, Mulley and Bardell, 2019). The Companies Act 2006, Combined Code of Corporate Governance, and Stewardship Code are some examples of the encouraging legal environment towards shareholder activism. Indeed, Davies, Mulley and Bardell (2019) argue that the UK's legal and regulatory framework of shareholder rights is the most empowering for shareholder activism when comparing to other European country frameworks. Institutional investors in the UK have been reported to engage more with the firm management and regularly meet with the board and top management to discuss strategies, governance issues, and financial performance (Williams and Conley, 2005; Aguilera et al., 2006). The mainstream UK institutions have senior managers responsible for corporate governance activities and dedicated teams of corporate governance experts, who often meet with the managers or boards of their portfolio companies (Hendry et al., 2007).

Thus, the UK setting is particularly suited for testing theories of monitoring, engagement and trading aimed to study the role of institutional ownership on corporate finance and corporate governance as the UK setting has several characteristics that are necessary to increase monitoring, engagement and trading. On the one hand, institutional investors in the UK have been encouraged through the various corporate governance codes and guidance (including the Stewardship codes) to be a potent force for helping ensure good governance in their investee companies. On the other hand, UK equity markets have a high degree of efficiency and the listing rules favour independent shareholders.

This thesis provides empirical evidence on the important role of institutional ownership on corporate finance and corporate governance in the context of the UK. In particular, the first two essays of the thesis focus on the effect of institutional investors' investment horizon on corporate cash policies. The third/last essay investigates the effect of long-term institutional ownership on shareholder proposals as effective tool/channel of corporate changes.

Research on corporate cash holdings has been one of the central topics in corporate finance literature during the last few decades, especially in the last twenty years since the publication of influential articles by Kim, Mauer and Sherman (1998) and Opler et al. (1999). Amess, Banerji and Lampousis (2015) argue that the increase in interest for this topic can be attributed to that companies all over the world have been consistently increasing the amounts of cash they hold over time. For example, in the UK, while corporate cash holdings represented 9.9% of firms' total assets during the 1990s (Ozkan and Ozkan, 2004), it has represented 13.7% during the last two decades (Farinha, Mateus and Soares, 2018). Similar trends have been documented on other developed and emerging markets. Indeed, the increase of firms' cash holdings worldwide increased both the interest of scholars and practitioners on this topic, with the main aims to identify the motives, the drivers and the consequences for holding cash [for a recent review, see Weidemann (2018)].

The first essay of the thesis aims not only to investigate the effect of long-term institutional ownership on cash holdings but also considers the role of the firms' contexts. Prior studies show that cash is a valuable strategic asset (George, 2005; Kim and Bettis, 2014) that creates shareholder value, especially when used for adaptation in the face of uncertainties (Deb, David and O'Brien, 2017). Building on economic perspectives, the behavioural theory and the value-creation versus value-appropriation literatures, I argue that the effect of long-term institutional investors on cash holdings depends on the magnitude of the agency costs and is driven by the implications of cash for firm performance that are context specific. My analysis shows that there is a negative relationship between long-term institutional ownership and corporate cash holdings, and this relationship is larger for firms with high agency costs. Moreover, I focus on different contexts (firm diversification, industry R&D intensity and industry growth) of the implications of cash for firm performance, and I find that the negative relationship between long-term institutional ownership and cash holdings is also significantly moderated by the firms' contexts.

The first essay provides several contributions. First, this essay contributes to the empirical literature on cash holdings. Despite the interesting institutional setting in the UK, empirical studies on the role of institutional investors in monitoring a firm's cash holdings have focused mainly on US firms though documented mixed results. Additional evidence from the UK is therefore useful in developing a broader view on the role of institutional investors in monitoring a firm's cash holdings. Second, this essay also makes theoretical contributions. On the one hand, I argue and find that the magnitude of agency costs could aggravate or alleviate the negative relationship between long-term institutional ownership and firm cash holdings. On the other hand, I further show that this relationship not only depends on the agency costs but is also moderated by the implications of cash for firm performance that are context specific.

The second essay of the thesis aims to the effect of long-term institutional ownership on cash holdings considering the cash deviation from the optimal level of cash. Prior studies find that the cash deviation from the optimal level of cash has a significant negative effect on firm's operating performance (Dittmar and Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013; Chen and Shane, 2014; Oler and Picconi, 2014) and value (Harford, Mansi and Maxwell, 2008; Martínez-Sola, García-Teruel and Martínez-Solano, 2013; Lin and Chiu, 2017). Building on the agency theory and the precautionary needs for cash holdings, I argue that the effect of long-term institutional investors on cash holdings depends on the cash deviation from the optimal level of cash. My analysis shows that while long-term institutional ownership is negatively associated with cash holdings only for firms with excess cash, firms with a high presence of long-term institutional investors increase cash when they hold cash below the optimal level. Moreover, I find that long-term institutional ownership is associated with higher value of cash holdings and is positively moderating the negative relationship between excess cash and operating performance.

The second essay makes several contributions. First, it contributes to the cash holding literature by focusing on the deviation of cash holdings. Previous literature has extensively studied the determinants of cash level. Focusing of the cash deviation has two distinctive merits. One the one hand, it enables us to empirically examine the discretionary component of cash that is not explained by the firm's fundamental needs for cash and is documented by recent literature to have negative effect on firm's value. On the second hand, the cash deviation is a suitable variable for capturing both agency concerns (i.e. cash above optimum) and precautionary motives (i.e. cash below optimum) of corporate cash, and such multi-view

approached is urged by corporate governance scholars. Second, the second essay provides additional evidence on the effect of institutional investors' investment horizon on corporate cash policy. Studying the investment horizon of institutional investors and cash deviation together enables us to test the heterogonous effect of institutional ownership on cash. Therefore, my results can help explain the contradictory findings in the literature on the effect of institutional investment horizon on cash policy. Finally, this essay provides a comprehensive investigation on the effect of institutional investors' investment horizon on corporate cash policy within a single recent context. Prior studies while document consistent increases in the level and value of corporate cash holdings since the 1980s, they attribute these trends to several market and corporate factors depending on the period of time (Bates, Kahle and Stulz, 2009; Bates, Chang and Chi, 2018). Thus, using one context for a recent period to comprehensively study the effect of long-term institutional ownership on cash level, the value of cash and the use of excess cash, can help extend the existing literature with comprehensive and consistent results.

The last essay of the thesis aims to study the role of institutional investors' investment horizon on shareholder proposals. Particularly, it investigate the effect of long-term institutional ownership on the probability of shareholder proposals targeting, market reaction to shareholder proposals, and voting outcome of these proposals. The shareholder proposal is a powerful governance tool available to shareholders in the UK to implement corporate changes in their investee firms, and is even more powerful than in the US (Buchanan et al., 2012). Building on the agency view and the monitoring function of institutional investors, I argue that the presence of institutional investors with a long-term investment horizon is associated with a lower probability of shareholder proposals targeting and a better outcome of shareholder proposals. My analysis shows that firms with high proportions of long-term institutional ownership is less likely to be targeted by shareholder proposals. Moreover, I find that while long-term institutional ownership is positively associated with cumulative abnormal return (CARs) around the general meeting dates, it is negatively (positively) associated with dissent (in favour) voting on shareholder proposals.

The last essay makes several contributions. First, this essay contributes to the literature on the role of investor horizon on firm decision-making. On the one hand, while empirical studies mainly focus on the correlation relationship between investor horizon and several firms' corporate decisions and governance practices, little is known about how that correlation occurs.

This essay not only confirms the previously reported important role of investor horizon on influencing a firm's policies, governance and strategies, but also provides evidence on how such impact has occurred. Second, this essay argues that it is important to differentiate between institutional investors based on their investment horizon when studying shareholder activism. In particular, while the literature on shareholder proposals mainly documents that institutional ownership and shareholder proposals targeting are positively correlated, such results are contradictory to the common expectation of the effective monitoring function of institutional shareholders (Goranova et al., 2017). The results documented in this essay conversely show that institutional ownership of long-term shareholders decreases the likelihood of shareholder proposals targeting. Finally, this essay aims to broaden the empirical literature of shareholder proposals by not only providing additional evidence from the UK, but also by conducting a comprehensive analysis of shareholder proposals using a long and recent sample of shareholder proposals. Recent and comprehensive evidence on the determinants and outcomes of shareholder proposals is important, as recent literature documents the evolution over time of the use of shareholder proposals by activist shareholders, positive market reaction around proposal submission, and positive votes cast by voting shareholders.

Overall, this thesis aims to investigate the role of institutional ownership, particularly long-term institutional investors, on corporate finance and corporate governance. The findings in this thesis support the proposed arguments/predictions and provide evidence on the effective monitoring role of long-term institutional ownership. Several estimations strategic/techniques are employed to check the robustness of these findings. The documented empirical findings suggests new directions and potential avenues for future research. This thesis makes several empirical and theoretical contributions.

The rest of the thesis is organized as follows: Essay 1 investigates the effect of long-term institutional ownership on cash holdings and the moderating role of the firms' contexts, Essay 2 studies the effect of long-term institutional ownership on the level and value of cash holdings considering the cash deviation from the optimal level of cash, Essay 3 investigates the effect of long-term institutional ownership on the probability of shareholder proposals targeting, market reaction around shareholder proposal meetings, and voting outcome of shareholder proposals, Finally, the conclusion summaries the findings and the suggested potential avenues for future research of these essays.

Essay 1. Long-term institutional investors' ownership and cash holdings. The moderating role of contexts. New evidence from UK listed firms*

Abstract

This study provides novel empirical evidence on the impact of long-term institutional investors' ownership on firms' cash holdings using a large sample of UK listed firms for the period 2000–2016. I build on economic perspectives, the behavioural theory and the value-creation versus value-appropriation literatures. My analysis shows that long-term institutional investors' ownership is associated with lower firm cash holdings and that this negative relationship is significantly more pronounced for firms with high agency costs. I further show that the link between long-term institutional investors' ownership and cash holdings is context specific. Firms with a high proportion of long-term institutional investors hold more cash if they are more diversified and face lower agency costs. However, firms with a high proportion of long-term institutional investors are pressured to further reduce their cash holding when agency costs are high, even if they operate in industries with high growth opportunities or in industries with high R&D intensity. Overall, my findings are robust to several estimation strategies.

Keywords: *Institutional investors, investment horizon, cash holdings, firm diversification, industry R&D intensity and industry growth*

*This paper has been peer-reviewed and accepted at the British Academy of Management Conference – BAM 2020 where it has been presented on September 2020 and awarded the Best Full paper in the Corporate Governance Track, the 6th Annual International Corporate Governance Society Conference – ICGS 2020 where it has been presented on November 2020, and the European Academy of Management Conference – EURAM 2020 where it has been presented on December 2020.

1. Introduction

Companies all over the world have been consistently increasing the amounts of cash they hold over time. Bates, Kahle and Stulz (2009) show that corporate cash has been doubled between 1980 and 2003 to reach 23.2% of the total assets of US firms. Similar trends were documented in other developed countries [see Pinkowitz and Williamson (2001) for evidence from Japan; García-Teruel and Martínez-Solano (2008) for evidence from Spain; and Schauten, van Dijk and der Waal (2013) for evidence from large companies all over Europe]. Emerging markets also picked up the trend: Chen et al. (2012) report that the percentage of cash to total assets is 20% in China and a recent article in *The Economist*[1] states that South Korean firms hold $440 billion in cash, which represents approximately 34% of the country's GDP. More recently, uncertainty associated with Brexit has triggered UK companies to significantly increase their cash holdings (The Deloitte CFO Survey, Q1 2019). In particular, UK companies held a record £747 billion in cash at the end of 2018, equivalent to 35% of GDP and almost one-third higher than in early 2016.

The increase of firms' cash holdings worldwide increased both the interest of scholars and practitioners on this topic, with the main aims to identify the motives, the drivers and the consequences for holding cash [for a recent review see, Weidemann (2018)]. Overall, prior studies show that cash is a valuable strategic asset (George, 2005; Kim and Bettis, 2014) that creates shareholder value, especially when used for adaptation in the face of uncertainties (Deb, David and O'Brien, 2017). While holding large amounts of cash could be beneficial for shareholders in the face of uncertainties, it could also be detrimental for shareholders if these high levels of cash are not used to create shareholder value. A main concern for shareholders is that large cash holdings accumulated by firms could be easily misused by opportunistic managers (i.e. agency cost, see Jensen and Meckling, 1976, and Jensen, 1986). Given this concern, recent literature using several perspectives (such as agency theory, behavioural theory, resource dependence theory, critical mass theory and so on) has been focusing on the drivers of cash holding and mechanisms that maximize/reduce the benefits of holding cash. For example, studies have been focused on firms' characteristics (Kim and Bettis, 2014; Aktas, Louca and Petmezas, 2019), their governance quality (Dittmar and Mahrt-Smith, 2007; Harford, Mansi and Maxwell, 2008; Deb, David and O'Brien, 2017), industry context (Chen, 2008; Deb,

[1] 'A $2.5 trillion problem', *The Economist*, September 27th, 2014.

David and O'Brien, 2017), and CEO characteristics (Aktas, Louca and Petmezas, 2019). Despite the large number of studies, the findings of these studies are still mixed and inconclusive [see for example, Weidemann, (2018)]. In this paper, I aim to contribute to this literature by examining how long-term institutional investors' ownership affects firms' cash holdings, focusing on the moderating role of contexts, while accounting for the magnitude of agency costs.

My focus on the role of institutional investors' ownership is motivated by their dominant position among corporate owners. Institutional ownership has been increasing in many countries around the world for the past six decades. Nowadays institutional investors have become particularly important shareholders in Anglo-American countries (Blume and Keim, 2017; Mallin, 2018; OECD, 2017). Institutional investors are not only large but also sophisticated shareholders who have the power to determine the strategy of the firm (Thomsen and Pedersen, 2000; Gillan and Starks, 2003; Tihanyi et al., 2003) and therefore the firm's outcome [for a recent review, see Goranova and Ryan (2014)]. They are characterized by low risk to prioritize shareholder value and liquidity (Thomsen and Pedersen, 2000; Gillan, Kensinger and Martin, 2000). Further, a recent survey of institutional investors by McCahery, Sautner and Starks (2016) highlights that institutional investors with a longer investment horizon tend to monitor the management of their investee firms using the several tools at their disposal more than their short-term counterparts. Consequently, I focus on institutional investors' ownership with a long-term investment horizon. Prior studies argue that these investors as rational shareholders have the bigger incentive to effectively monitor their investee firms on an ongoing basis [see for example Chen, Harford and Li (2007) and Shleifer and Vishny (1997)]. This is likely to reduce agency costs, which in turn would alleviate overinvestment problems arising from holding large amounts of cash. I therefore posit that higher long-term institutional ownership would be associated with a firm's lower cash holdings.

In this study, I use a comprehensive dataset of all public firms traded on the London Stock Exchange over the period from 2000 to 2016. The UK provides an interesting country context for studying institutional investors because the level of institutional ownership in the UK is one of the highest in the world (Ferreira and Matos, 2008). Also, while the US and UK share many similarities in governance systems (i.e., a common law system and high protection of minority rights), important differences include the role and rights of institutional investors and the nature of corporate governance reforms. The UK corporate governance system is often

described as being shareholder-led. Contrary to the US regulator-led approach, it gives shareholders the independence of deciding which monitoring strategy to employ to protect their interests. Institutional investors in the UK have been reported to engage more with the firm management and regularly meet with the board and top management to discuss strategies, governance issues, and financial performance (Williams and Conley, 2005; Aguilera et al., 2006). The mainstream UK institutions have senior managers responsible for corporate governance activities and dedicated teams of corporate governance experts, who often meet with the managers or boards of their portfolio companies (Hendry et al., 2007). Despite the interesting institutional setting in the UK, empirical studies have focused mainly on US firms.[2] Additional evidence from the UK is therefore useful in developing a broader view on the role of institutional investors in monitoring a firm's cash holdings. This study makes several important contributions. First, this study contributes to the empirical literature on cash holdings. In particular, I provide novel evidence that long-term institutional investors' ownership is negatively related to the amount of cash holdings. For instance, in a fifteen-year period, cash holdings in firms with long-term institutional ownership decreased. Second, this study makes several theoretical contributions. I build on economic perspectives, the behavioural theory and the value-creation versus value-appropriation literatures.

On the one hand, I argue that the magnitude of agency costs could aggravate or alleviate the negative relationship between long-term institutional ownership and firm cash holdings. On the other hand, I argue that the decision of long-term institutional investors to monitor opportunistic managers depends on the magnitude of the agency costs and is driven by the implications of cash for firm performance that are context specific (Deb, David and O'Brien, 2017). Specifically, I look at the degree of firm diversification, industry R&D intensity and industry growth opportunities[3]. I show that the negative relationship between long-term

[2] Even in the US context the issue is far from settled – studies report mixed results. While Cleary and Wang (2017) find that long-term institutional investors' ownership decreases cash holdings, Harford, Kecskés and Mansi (2012, 2018) find that firms with higher institutional ownership hold more cash but the negative effect of long-term institutional ownership is not statistically significant. Moreover, Huang and Petkevich (2016) find that both short-term and long-term institutional investors have positive effects on cash holdings. But, firms with more short-term institutional investors hold more cash than firms with more long-term institutional investors. They argue that long-term institutional investors seek value-enhancing information, while short-term investors focus on collecting value-neutral information.

[3] Deb et al. (2017) discuss six contexts that are splitted into two groups. The first group which they called 'value creation contexts' and include industry competition, industry R&D intensity and industry growth, and the second group which they called 'value appropriation contexts' and includes corporate governance, diversification and corporate opacity. The ideal situation is to analysis all six contexts; however, I faced a data availability challenge with two of the value appropriation contexts; corporate governance and firm opacity. My sample consistent of all UK firms listed in London Stock Exchange which include FTSE All-Share index and FTSE AIM All-Share index. The available proxy I could use for corporate governance is Corporate Governance Score that is available through Asset4 database; however, Asset4 does not cover all UK firms, it only covers 412 firms which I believe belong to FTSE 350. So, when I used this variable, my sample reduced from 11,245 to 2,578 firm-year observations. Similarly, the index that proxy for firm opacity consists of four variables, trading volume, bid-ask spread,

institutional ownership and corporate cash holdings is significantly higher in firms with high agency costs, and I demonstrate that more diversified firms hold more cash than less diversified firms under long-term institutional investors' monitoring. This positive effect of long-term institutional ownership on cash holdings however is only significant for firms with low agency costs. As high levels of diversification complemented by large cash holdings could be detrimental for firm performance (Deb, David and O'Brien, 2017), long-term institutional owners ensure that firms do not hold extra cash when agency costs are high but allow for extra cash when agency costs are low. Conversely, long-term institutional ownership is associated with lower cash holdings if firms operate in industries characterized by high R&D intensity or by high growth opportunities. I find that firms operating in industries with high R&D intensity tend to hold less cash as long-term institutional ownership increases. The effect however is driven by firms with high agency costs. Similarly, the cash holdings of firms in industries with high growth opportunities with long-term institutional ownership is lower compared to firms in industries with low growth opportunities. The negative relationship is only significant for firms with high agency costs but not significant for firms with low agency costs. Overall, my results suggest that the effect of long-term institutional ownership on cash holdings depends both on the magnitude of the agency costs and of the firm's contexts (i.e. firm diversification, industry R&D intensity and industry growth). The study provides some evidence on "how governance could limit the potential for bad or self-serving managerial decisions, while encouraging strategies that create long-term shareholder value" (Goranova et al., 2017, p. 2294)

A potential concern is the extent to which my results can be interpreted causally. To address this concern, I employ a variety of estimation strategies and my findings are robust to these measures.

The rest of the paper is organized as follows: Section 2 outlines the theoretical background and hypotheses development, Sections 3 and 4 explain the econometric

number of analyst following the firm and analyst forecast error, and the two variables related to analyst forecasting are available through I/B/E/S database and such variables are not available for all firms as analysts usually focus on large and liquid firms. So, when I used these variables to construct the index for firm opacity, my sample reduced from 11,245 to 5,669 firm-year observations. Thus, I have decided to conduct my study using the large sample of all UK firms and adopt one proxy for value appropriation contexts (i.e., firm diversification) which is available for all firms in my sample. Given the challenge of the data for value appropriate contexts, I have also decided to choose two proxies from the value creation contexts used by Deb et al. (2017) (i.e., industry R&D intensity and industry growth). It is worth noting that using the other three contexts that I have not use in my study provides consistent results with my arguments and results (empirical results for these contexts are available in Appendix A).

specification and the data respectively, Section 5 reports the results of the study, and Section 6 provides a conclusion.

2. Literature Review and Hypotheses Development

Economic perspectives like agency theory argue that holding large amounts of cash could aggravate conflicts of interests among a firm's shareholders and their managers (Jensen, 1986). Naturally, managers would have more influence over cash spending decisions, which gives rise to agency conflicts in the firm. Institutional investors could be effective monitors. There are however differences between short-term and long-term institutional investors. Specifically, long-term institutional owners could have much more skin in the game.

Previous studies support this view. In particular, they show that long-term and short-term institutional investors exhibit heterogeneous trading behaviour and monitoring effectiveness, and tend to implement heterogeneous financing and investment policies in their investee firms. Several empirical studies emphasize that both monitoring by institutional investors and their degree of public and private engagements depend on their investment horizons [for a recent review of empirical studies on shareholder activism, see Goranova and Ryan (2014)]. For example, in the context of payout policies, Gaspar, Massa and Matos (2013) find that short-term institutional investors support share repurchases over dividends. In addition, long-term institutional investors are shown to be less likely to change their holding positions in response to good or bad news than short-term institutional investors (Hotchkiss and Strickland, 2003). They are argued to benefit from their long-term position by utilizing private information they have about the firm to enhance firm performance (Chen, Harford and Li, 2007; Borochin and Yang, 2017), including corporate social performance (Neubaum and Zahra, 2006). Regarding financing decisions, firms with larger long-term institutional ownership have been shown to use more external debt (Huang and Petkevich, 2016; Cleary and Wang, 2017), and more internal funding (Huang and Petkevich, 2016), but less external equity (Huang and Petkevich, 2016; Harford, Kecskés and Mansi, 2018) and seasoned equity (Hao, 2014). Using several measures for firm performance, Yin, Ward and Tsolacos (2018) find that long-term institutional ownership has positive 'long-lasting' effect on firm performance. Moreover, a recent study by Cremers, Pareek and Sautner (2020) finds that firms that experience a large increase in short-term institutional ownership reduce long-term investments (i.e., R&D) which decreases firm's long-term value.

In the context of cash holdings, economic perspectives such as agency theory (Jensen, 1986; Shleifer and Vishny, 1997) provide rationale for long-term investors to engage with a firm when the benefits of monitoring exceed the agency costs associated with free cash flow. Within a cost-benefit framework (i.e. a cost-benefit analysis of monitoring versus trading), Chen, Harford and Li (2007) argue that long-term institutional investors are effective monitors of firms because their monitoring costs decrease and monitoring benefits increase with the length of time they invest in the firm. Moreover, in a recent survey of large institutional investors, McCahery, Sautner and Starks (2016) find that long-term institutional investors are more likely to actively engage with the management of their investee firms to monitor firms' policies. I develop a coherent argument that demonstrates how, using the several private and public tools at their disposal to engage with their investee firms, they have stronger incentives to monitor the management's actions in such firms effectively.

In the context of cash holding policies, there is evidence that institutional investors closely monitor managers' actions to ensure efficient use of cash resulting in a higher value of cash holdings (Dittmar and Mahrt-Smith, 2007). Moreover, a few recent studies show that institutional investors' horizons affect cash holdings. On the one hand, it has been found that long-term investors are more likely than short-term investors to decrease firms' cash (Huang and Petkevich, 2016). On the other hand, a negative relationship has been shown between the higher presence of long-term investors and cash holdings (Cleary and Wang, 2017).

In this vein, I expect that long-term institutional investors are more likely to decrease the cash holdings of their investee firms, as investors that would get high net benefits from engaging with their companies are more likely to devote more resources to this process. As these benefits are likely to be higher for long-term institutional investors (Chen, Harford and Li, 2007; Goranova and Ryan, 2014; McCahery, Sautner and Starks, 2016, Yin, Ward and Tsolacos, 2018), I posit that long-term institutional investors will act as effective monitors and therefore their higher presence would be associated with lower cash holdings.

Building on agency theory (Jensen, 1986; Shleifer and Vishny, 1997), I also argue that the negative effect of long-term institutional investors on corporate cash holdings is dependent on the magnitude of the agency costs. In doing so, I extend the work of previous studies that have focused on the moderating role of the agency costs [see for example Florackis and Ozkan (2009)]. I expect that long-term institutional investors would engage in order to decrease cash holdings more in firms with high agency costs than in firms with low agency costs, as the

expected net benefits of engagement (if successful) would be higher in firms with high agency costs. Succinctly, I posit that the negative effect of institutional investors with long-term investment horizons on cash holdings will be more pronounced in firms with high agency costs. Therefore, I hypothesize:

H1a: *The proportion of long-term institutional ownership is negatively associated with a firm's cash holdings.*

H1b: *Agency costs will moderate positively the relationship between long-term institutional ownership and cash holdings.*

Recent studies building on economic perspectives, behavioural theory and the value-creation versus value-appropriation literatures argue that "cash is surprisingly valuable as a strategic asset" (Kim and Bettis, 2014, p. 2053) and that "the implications of cash for firm performance are context specific" (Deb, David and O'Brien, 2017, p. 436). For example, Deb, David and O'Brien (2017) find that holding cash in value creation contexts (i.e., highly competitive, research-intensive or growth-focused industries) is beneficial for firm performance because in such contexts it is used for adaptation to complex environments. Conversely, holding cash in value appropriation contexts (i.e., poorly governed, diversified or opaque firms) could be harmful for firm performance, because in such contexts it is used for value appropriation by stakeholders. Given that the performance benefits of cash depend on the context, I speculate that the monitoring intensity of opportunistic managers by long-term institutional investors could also be context specific. I pay special attention to firms that are diversified, operate in research-intensive industries and industries with high growth opportunities.

Industry R&D Intensity

The lack of cash is often linked to the lack of R&D investment by firms (Cuervo-Cazurra and Un, 2010). Firms operating in industries with high R&D intensity are likely to have a focus on innovation. R&D driven innovation is difficult to finance using external funds due to its intangible nature, uncertain outcome, and potentially severe information problems (Myers and Majluf, 1984). R&D is mainly financed by internal cash flow and stock issues (Brown, Fazzari, and Petersen, 2009). To avoid paying a premium to secure external capital (Levitas and McFadyen, 2009), firms in R&D intensive industries tend to rely more on

precautionary cash to smooth R&D (Brown and Petersen, 2011). In addition, industries with high R&D intensity are often characterized by a rapid pace of technological change and by a high level of uncertainty in demand and risk, which may motivate firms to either use cash as a strategic weapon (Lyandres and Palazzo, 2012) or hold cash as a precaution to ensure survival.

From the shareholder perspective, transparency of R&D investment is generally lower and there is more room for expropriation by managers. R&D investment decisions are often risky and, if successful, are likely to generate returns only in the longer term and therefore may require the support of long-term shareholders, especially long-term institutional investors. The impact of institutional investors on R&D investment and/or innovation has mainly been studied in the US context and the results are mixed. Bushee (1998) and Aghion, Van Reenen, and Zingales (2013) find that institutional ownership has a positive effect on R&D investment and innovation, while Harford, Kecskés and Mansi (2018) report a negative effect on R&D spending and a positive effect on innovation efficiency. Brav et al. (2014) show that firms reduce their R&D spending when targeted by activists but increase their innovation output. Lastly, Huang and Petkevich (2016) find no significant relationship between R&D investment and long-term institutional ownership.

If cash is beneficial for performance in firms operating in high R&D intensity industries, as it can foster adaptation and is also a source of innovation (Deb, David and O'Brien, 2017; Levitas and McFadyen, 2009), I posit that industry R&D intensity negatively moderates the relationship between the long-term institutional investors' investment horizon and corporate cash holdings. In other words, I expect that firms with a high proportion of long-term institutional investors' ownership will have more cash, as long-term institutional investors will be more likely to support the management to hold cash and then monitor the management, with the aim to force the management to invest such cash to increase firm performance.

In addition, the effect of industry R&D intensity and industry growth as moderators of such a relationship will be stronger in firms with high agency costs than in firms with low agency costs. In other words, I expect that long-term institutional investors would prefer that firms operating in high R&D intensity industries with high agency costs invest cash instead of sitting on a pile of cash, as these investments will be necessary to increase firm performance (Deb, David and O'Brien, 2017). For firms with low agency cost, I expect that long-term institutional investors will leave the decision to management regarding the lack of resources

and their importance for such firms (Cuervo-Cazurra and Un, 2010). Therefore, I hypothesize that:

H2: *The negative relationship between the proportion of long-term institutional ownership and a firm's cash holdings is stronger in firms operating in high R&D intensity industries, especially in firms with high agency costs.*

Industry Growth

If cash is beneficial for performance in firms operating in industries with high growth opportunities, for which investment opportunities are widely available as they can facilitate adaptation (Deb, David and O'Brien, 2017), then I posit that industry growth negatively moderates the relationship between long-term institutional investors' investment horizon and corporate cash holdings.

The numerous attractive investment opportunities, strategic investments (including entering into strategic alliances), investment in technologies, joint ventures and the uncertainties about the time they arise, are just some of the reasons for which large amounts of cash with high potential return are good for firm performance in such firms (Boyle and Guthrie, 2003; Chen et al., 2000; Grant, 2013; Park, Chen and Gallagher, 2002). These reasons help to explain why I expect that industry growth negatively moderates the relationship between long-term institutional investors' investment horizon and corporate cash holdings. Similarly to R&D intensity, I expect that long-term institutional investors will be more likely to support the management to hold cash in firms operating in industries with high growth opportunities and then monitor (engage with) the management with the aim to force the management to invest such cash in investment opportunities with high potential return in search of good performance (Deb, David and O'Brien, 2017; Grant, 2013).

In addition, the effect of industry growth as moderator of such a relationship will be stronger in firms with high agency costs than in firms with low agency costs. Similarly to R&D intensity, I expect that long-term institutional investors want firms operating in industries with high growth opportunities with high agency costs to invest instead of sitting on cash, as these investments will be necessary to increase firm performance (Deb, David and O'Brien, 2017; Grant, 2013). For firms with low agency cost, I expect that long-term institutional investors

will leave the decision to management regarding the lack of resources and their importance for such firms (Grant, 2013; Myers, 1977).

My prediction is based on the assumption that in firms operating in industries with high growth opportunities the decision of the management to invest cash also depends on the owners of the firms. In particular, the management needs and is looking for the support of long-term shareholders, especially long-term institutional investors, to invest cash, as for example in strategic alliances or in investments in technology. This is because firms with high growth opportunities are more likely to experience failure and incur high costs (including bankruptcy costs) and/or are more likely to generate returns only in the long term (Opler et al., 1999; Myers, 1977, Shleifer and Vishny, 1992). Therefore, I hypothesize that:

H3: *The negative relationship between the proportion of long-term institutional ownership and a firm's cash holdings is stronger in firms operating in industries with high growth opportunities, especially in firms with high agency costs.*

Diversification

The detrimental effect of cash on the performance of firms that are diversified could motivate long-term institutional investors to closely monitor their investee firms and to engage more with their management to decrease the level of cash under managers' purview. This strategy could help to avoid the decrease in shareholder value as a consequence of value appropriation actions by opportunistic managers or other stakeholders (Shleifer and Vishny, 1997). At the same time, monitoring of diversified firms could be complex and costly, especially the ones with high agency costs. Several studies highlight potential explanations for why this is often the case. First, value appropriation by management is easier and more likely to occur in diversified firms as they encourage rent-seeking actions both by corporate and divisional managers (Ndofor, Wesley and Priem, 2015). Second, diversified firms are characterized by higher conflicts between competing divisional managers and by misallocation of cash resources to less efficient individual divisional units (Rajan, Servaes and Zingales, 2000). Third, monitoring of opportunistic managers by shareholders (including long-term institutional investors) and other stakeholders (including media) in diversified firms is more complex and costly due to accentuated information asymmetry between management and stakeholders (Goranova et al., 2007). For example, the publication of consolidated accounts

facilitates the obfuscation of data on the efficiency of individual divisional units (Hill and Jones, 1992). Fourth, information asymmetry increases between the corporate centre and the divisional managers when the number of divisional units is increased (Hitt et al., 2017). Finally, several conflicts can also arise between different institutional investors (e.g., short-term versus long-term institutional investors) and/or between institutional investors and other stakeholders (such as creditors and employees), which can increase agency costs (Coffee, 2017).

Given the complexity and the high costs of monitoring of diversified firms, long-term institutional investors are less likely to be effective monitors in these firms. I therefore expect that firm diversification positively moderates the relationship between long-term institutional investors and firm cash holdings. This effect would be less pronounced in firms with high agency costs than in firms with low agency costs because the effectiveness of monitoring is likely to be dependent on the magnitude of the agency costs. In addition, the cost and complexity of monitoring of diversified firms could also encourage long-term institutional investors to become lax on cash holdings in firms with low agency costs. Therefore, I hypothesize:

H4: *Firm diversification positively moderates the relationship between the proportion of long-term institutional ownership and a firm's cash holdings, especially in firms with low agency costs.*

3. Econometric Specification

My main interest is in the relationship between firm cash holdings and long-term institutional ownership. I estimate the following specification:

$$Cash/TA_{it} = \beta_1 LTIO_{it} + \beta_2 X_{it} + \varphi_j + \tau_t + \epsilon_{it}, \quad (1)$$

where *Cash/TA* denotes the cash holdings of firm *i* at time *t*. *LTIO* is the long-term institutional ownership. I also control for a set of firm-specific characteristics [i.e. X, see the next section for a full list and description of these variables]. φ and τ are complete sets of three-digit SIC codes and time fixed effects. ϵ is an iid error term.

Different types of long-term institutional investors. In separate regressions I also differentiate between different types of long-term institutional investors. Specifically, I look at the long-term investors that invested in a firm as part of their investment in a particular stock

market index or long-term investors with a high turnover portfolio. These investors are expected to be much more passive investors and are likely widely diversified (Bushee, 1998; Derrien, Kecskés and Thesmar, 2013; Wang, 2014) meaning that they would not care too much about any particular firm in their large portfolio. At the same time, non-indexer and long-term investors with a low turnover portfolio would be much more interested in firm policies. I expect that cash holdings would be lower in firms with long-term institutional investors that are actively involved in firm affairs (i.e. Long-term IO non-indexer and Long-term IO with low portfolio turnover).

Reverse causality and omitted variables. I also address omitted variables concerns, by using firm fixed effects that control for time-invariant unobserved firm heterogeneity. Furthermore, I address reverse causality and omitted variables concerns using instrumental variable (IV) methods that isolate plausible exogenous variation in institutional ownership. A potential concern is that long-term institutional investors could invest in firms with certain characteristics. To address these concerns, I use an instrumental variable strategy. Several recent papers (such as Aghion, Van Reenen, and Zingales (2013) among others) show that investors in index firms affects a variety of market prices and corporate policies. Following Aghion, Van Reenen, and Zingales (2013), I use the initial institutional ownership by long-term investors and index firms (i.e. FTSE 100) as instrument variables of my variable of interest, *LTIO*.

4. Data and Variables

4.1 Sample and data sources

To empirically document the relationship between an investment horizon of institutional investors and corporate cash holdings, I focus on the UK firms that traded on the London Stock Exchange over the period from 2000 to 2016. Data derives from different sources. I start by collecting ownership data from Thomson Reuters Eikon *Ownership & Profiles* module. The module provides detailed information about the name of each shareholder, the number and type of shares held, and the first date of holding. I further match firms with full ownership information available to the Thomson Reuters Datastream database to obtain their financial and accounting information (e.g, size, profitability, industry sector, etc.). Then, I collect data about the main corporate governance characteristics (e.g., CEO duality,

Independent NED on Board (%), Board Size) from BoardEx and the Thomson Reuters Asset4 module.

Following the literature, I exclude firms operating in financial industries (SIC codes 6000–6999) and utility industries (SIC codes 4900–4999) because these industries are subject to several capital requirements and strong regulatory monitoring (Kim and Bettis, 2014). All continuous variables are truncated to remove the top and bottom 1% of their distributions to limit the impact of large outliers on my results. After excluding observations for which firm-level information is not available, I have a sample of 11,254 firm-year observations.

4.2 Variables

Dependent variable

I focus on cash as my main dependent variable. *Cash* is defined as a ratio of cash and cash equivalents to total assets (Bates, Kahle and Stulz, 2009; Dittmar and Mahrt-Smith, 2007; Opler et al., 1999). Use of cash stock is appropriate from the agency theory perspective as Jensen (1986) focused on the cumulative cash balance rather than the yearly free cash flow when characterizing managerial misbehaviour. It is also appropriate to use it from the behavioural theory angle: slack resource arguments.

Explanatory variables

The main explanatory variable of interest is long-term institutional ownership (*Long-term IO*), which measures the voting rights of the long-term institutional owners. Institutional owners include mutual investment funds, pension funds, hedge funds, banks and trusts, insurance companies, endowments and foundations, private equity, venture capital and investment advisors. Following recent empirical literature, I use the actual investment duration at the firm level by a specific institutional investor as a proxy for investment horizon (Elyasiani and Jia, 2010; Attig et al., 2012; Wang, 2014; Yin, Ward and Tsolacos, 2018). *Long-term IO*

is therefore defined as a ratio of total outstanding shares held by all long-term institutional investors with investment duration at firm level of at least eight quarters (two years).[4]

In my analysis, I further differentiate between long-term institutional investors that index (*Long-term IO indexer*) and long-term institutional investors that do not index (*Long-term IO non-indexer*). Indexers replicate the market index and do not choose the firms in which they invest; they are also more likely to be more passive investors. Instead, non-indexers carefully choose firms for their portfolio and are more likely to actively participate in firm decision making.

Another important distinction between long-term institutional investors is whether they hold low or high turnover portfolio. Institutional investors with low levels of portfolio turnover (*Long-term IO low portfolio turnover*) tend to be more dedicated to firms and have a "relationship" approach to investing. Due to their stable ownership positions, these institutions tend to have better access to private information about their portfolio firms and would be more efficient monitors (Porter, 1992; Bushee, 1998). At the same time, institutional investors with high levels of portfolio turnover (*Long-term IO high portfolio turnover*) would be much less preoccupied with the monitoring of firms in their portfolio. In addition, I also control for blockholder ownership (at 5%) in all specifications to separate investor horizons from investor concentration.

Given my focus on public firms, which are generally large and prone to agency problems, it is important to account for the extent of conflict of interest between managers and shareholders. While in theory the severity of this conflict is affected by the efficiency of the managerial labour market and the extent of product market discipline (Fama and Jensen, 1983), these concepts are hard to measure empirically. Nonetheless, Ang et al. (2000) followed by Singh and Davidson (2003), Fleming et al. (2005) and Florackis and Ozkan (2009) use the inverse asset turnover ratio to proxy for agency costs. This ratio is interpreted as an asset utilization ratio that shows how effectively management deploys the firm's assets. A high inverse asset turnover ratio indicates poor investment decisions, insufficient effort, and consumption of perquisites, and hence suggests that agency costs arising from the conflicts between managers and shareholders are high. In further analysis, agency costs are classified as

[4] Using different durations such as twelve quarters for long-term institutional investors does not change my results.

high (low) agency costs if firm-specific agency costs are above (below) the median value of the inverse asset turnover variable.

Firm Diversification is measured by the number of industries a firm operates in (which spans from 1 to 8). *R&D intensity* is the mean value of R&D intensity of all firms at the industry-year level (similar to Gentry and Shen, 2013; Deb, David and O'Brien, 2017), where R&D intensity is R&D expenses divided by sales. Missing R&D values are replaced by zeros and (the upper limit for R&D intensity is) capped at 1 (Kim and Bettis, 2014; Deb, David and O'Brien, 2017). Similarly, *Industry Growth Opportunities (Industry GO)* are defined as the mean value of market-to-book ratio at the industry-year level.

Control variables

In my analysis, I use a set of the most common firm-specific variables that have been used to explain cash holdings by firms in previous studies (e.g. Bates, Kahle and Stulz, 2009; Caprio, Del Giudice and Signori, 2020; Deb, David and O'Brien, 2017; Dittmar and Mahrt-Smith, 2007; Ferreira and Vilela, 2004; Harford, Kecskés and Mansi, 2018; Opler et al., 1999; Ozkan and Ozkan, 2004). These variables include Firm Size, Leverage, Market-to-book, Cash Flow, Industry Sigma, Net Working Capital (NWC), R&D, Capital Expenditure, Acquisition, and Dividend (dummy). For detailed definitions of all variables, see *Table A1* in Appendix A.

4.3 Descriptive statistics

Table 1 presents summary statistics for the main variables used in my analysis. Long-term institutional investors control on average 23% of a firm compared to 31% controlled by all institutional investors. 3.4% of the ownership is held by these long-term institutional investors who are indexers and 20.4% is held by non-indexers. Moreover, long-term institutional investors holding a low turnover portfolio own on average 16.1% of a firm, while long-term institutional investors holding a high turnover portfolio hold only 1.6%. About 21% of firm-years have a blockholder with at least 5% of shares present.

Table 1. Summary statistics

The table provides summary statistics for main ownership and firm-level variables used in the econometric analysis. Detailed definitions of all variables are reported in Appendix A Table A1. The sample contains all UK public firms and covers the period from 2000 to 2016.

				Distribution		
	N	Mean	St dev	5th	50th	95th
Ownership variables						
Long-term IO	11.254	0.233	0.212	0.000	0.174	0.642
Long-term IO (indexer)	7.431	0.034	0.038	0.000	0.025	0.110
Long-term IO (non-indexer)	11.218	0.204	0.186	0.000	0.156	0.559
Long-term IO (low portfolio turnover)	11.137	0.161	0.161	0.000	0.116	0.483
Long-term IO (high portfolio turnover)	8.851	0.016	0.031	0.000	0.001	0.083
Institutional Ownership	11254	0.313	0.227	0.014	0.270	0.726
Blockholding (5%)	11254	0.212	0.153	0.000	0.190	0.497
Firm-level variables						
Cash	11.254	0.135	0.154	0.003	0.079	0.468
Size	11.254	11.950	2.223	8.658	11.735	15.899
Leverage	11.254	0.169	0.167	0.000	0.136	0.489
Market-to-Book	11.254	1.791	1.309	0.688	1.393	4.279
Cash Flow	11.254	0.008	0.195	-0.357	0.055	0.177
Industry Sigma	11.254	0.464	0.445	0.048	0.322	1.270
NWC	11.254	0.019	0.196	-0.277	0.010	0.353
R&D	11.254	0.029	0.095	0.000	0.000	0.158
Capital Expenditure	11.254	0.044	0.052	0.002	0.027	0.152
Acquisition	11.254	0.025	0.056	0.000	0.000	0.148
Dividend	11.254	0.601	0.490	0.000	1.000	1.000

Overall, on average, firms in my sample hold about 13.5% of their total assets in cash. *Table 2* presents the distribution of long-term institutional ownership by main industries. For ease of presentation, I aggregate the three-digit SIC codes into broad industry-level categories.[5] I find that construction industries generally have the highest long-term institutional ownership (30%), followed by retail trade and wholesale trade (27%), transportation and communications, and manufacturing (26%). The lowest holdings of 12.9% by long-term institutional investors are observed in agriculture, forestry, and fishing industries.

In untabulated analysis, I check for the potential multi-collinearity in all my estimation models. I follow prior ownership and cash holdings literature (e.g., Bushee, 1998; Callen and Fang, 2013; Kim et. al, 2016; Miranda-Lopez et. al, 2019; Neubaum and Zahra; 2006; Tihanyi

[5] Industries are classified following SIC codes classification at the alphabetical level, A–J.

et. al, 2003) and adopt Variance Inflation Factor (VIF) analysis to test for multi-collinearity. I find that all VIFs of the independent variables through all my estimated regression models are below the conventional rule-of-thumb value of 10 (Neter et al, 1983). An exception is that there are some independent variables are highly correlated with their products that are included in the same regression model which leads to high VIFs that exceed the value of 10. However, as these high values are caused by the inclusion of products of other variables, these nigh VIFs 'is not a problem and can be safely ignored' (Allison, 2012).

Table 2. Distribution of long-term institutional ownership by industries

The table presents the distribution of long-term institutional investors holdings by industries. Industries are classified following SIC codes classification (alphabetical level, A–J).

				Distribution		
	N	Mean	St dev	5th	50th	95th
Agriculture, Forestry, And Fishing	108	0.129	0.115	0.000	0.101	0.366
Construction	342	0.300	0.222	0.000	0.307	0.656
Manufacturing	3965	0.263	0.218	0.000	0.210	0.656
Mining	1118	0.142	0.152	0.000	0.094	0.479
Retail Trade	1005	0.277	0.210	0.000	0.246	0.646
Services	3569	0.202	0.204	0.000	0.140	0.631
Transportation and Communications	738	0.264	0.211	0.000	0.230	0.637
Wholesale Trade	418	0.277	0.238	0.000	0.240	0.689

5. Estimation Results

5.1 Long-term institutional ownership and cash holdings

I start exploring the relationship between cash holdings and long-term institutional ownership by estimating basic regressions. *Table 3* displays the regression estimation results. I find a clear negative relationship suggesting that the presence of long-term institutional investors is associated with lower cash holdings by firms.

In Columns (2) – (4) I differentiate among long-term institutional investors on the basis of their investing style. Columns (2) and (3) differentiate between indexers and non-indexers. I see that the coefficient for the indexers is positive, close to zero and not significant. By contrast, the coefficient for the non-indexers is negative, significant and similar to the coefficient I obtained in my basic model. The differentiation between long-term institutional investors with low and high portfolio turnover generates similar results (Columns 4 and 5). The coefficient estimate for investors with low portfolio turnover is negative and significant, albeit

slightly lower than the effect obtained in the basic model, while the effect for investors with high portfolio turnover is positive and not significant. The absence of the effect for indexers and long-term institutional investors with high portfolio turnover is broadly consistent with the notion of passive investors that are not actively involved in firms' day-to-day operations.

My results are robust to several estimation strategies. First, I address omitted variables concerns using firm fixed effects that control for time-invariant unobserved firm heterogeneity. Column (6) contains the estimation. Second, I further address the endogeneity concern by re-estimating my main specification using an instrumental variable strategy. I use the initial ownership of long-term institutional investors and index firms. Columns (7) and (8) contain the estimation results.

Overall, the negative effect of long-term institutional investors on firm cash holdings is consistent with my main estimation and corroborate Hypothesis *H1*. In terms of economic significance, results from Column (1) suggest that a 1-standard-devaition increase in long-term institutional ownership (21.1%) is associated with a decrease in cash holdings by 2.37%.

Table 3. Long-term institutional ownership and cash holdings

The table presents the results of OLS and 2SLS regressions examining the effect of long-term institutional ownership on firms' cash holdings for the sample of the UK public firms during the period from 2000 to 2016. Long-term IO is defined as a ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least eight quarters (two years). Detailed definitions of all variables are reported in Appendix A Table A1. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Cash/Total Assets							
	OLS	OLS	OLS	OLS	OLS	FE	First stage	Second stage, IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Long-term IO	-0.112***					-0.099***		-0.280***
	(0.016)					(0.018)		(0.083)
Long-term IO (indexer)		0.020						
		(0.071)						
Long-term IO (non-indexer)			-0.095***					
			(0.018)					
Long-term IO (low portfolio turnover)				-0.077***				
				(0.014)				
Long-term IO (high portfolio turnover)					0.041			
					(0.064)			
Instrument								
Initial long-term IO							0.192***	
							(0.012)	
FTSE100							0.025***	
							(0.006)	
Controls								
Institutional Ownership	0.090***	-0.010	0.054***	0.035**	-0.001	0.092***	0.725***	0.220***
	(0.016)	(0.015)	(0.016)	(0.014)	(0.012)	(0.015)	(0.011)	(0.065)
Blockholding (5%)	0.001	0.002	0.020	0.013	0.023	0.003	-0.045***	-0.010
	(0.018)	(0.019)	(0.019)	(0.018)	(0.020)	(0.016)	(0.008)	(0.017)
Size	-0.009***	-0.011***	-0.009***	-0.010***	-0.009***	-0.022***	0.004***	-0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.001)	(0.002)
Leverage	-0.268***	-0.219***	-0.270***	-0.267***	-0.251***	-0.217***	0.012	-0.267***

	(0.018)	(0.023)	(0.018)	(0.018)	(0.022)	(0.021)	(0.008)	(0.017)
Market-to-Book	0.022***	0.017***	0.022***	0.022***	0.020***	0.012***	-0.004***	0.021***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Cash Flow	-0.011	-0.019	-0.012	-0.013	-0.018	0.008	-0.011**	-0.013
	(0.015)	(0.020)	(0.016)	(0.016)	(0.017)	(0.016)	(0.005)	(0.014)
Industry Sigma	0.006	0.011	0.006	0.005	0.010	0.002	0.000	0.006
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.007)	(0.004)	(0.007)
NWC	-0.151***	-0.171***	-0.150***	-0.150***	-0.163***	-0.192***	-0.008	-0.152***
	(0.016)	(0.021)	(0.016)	(0.016)	(0.017)	(0.016)	(0.006)	(0.016)
R&D	0.172***	0.140**	0.175***	0.174***	0.125**	0.055	0.018*	0.177***
	(0.035)	(0.049)	(0.036)	(0.037)	(0.044)	(0.034)	(0.011)	(0.036)
Capital Expenditure	-0.176***	-0.190***	-0.173***	-0.178***	-0.155***	-0.154***	-0.060***	-0.189***
	(0.039)	(0.053)	(0.039)	(0.040)	(0.045)	(0.038)	(0.023)	(0.039)
Acquisition	-0.200***	-0.172***	-0.202***	-0.195***	-0.192***	-0.157***	-0.085***	-0.218***
	(0.023)	(0.022)	(0.023)	(0.023)	(0.024)	(0.020)	(0.018)	(0.023)
Dividend	-0.013**	-0.022***	-0.013**	-0.014**	-0.020***	-0.003	0.018***	-0.010
	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.005)	(0.003)	(0.006)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects						Yes		
First stage F							141.3***	
Hansen J statistic								0.845
R^2	0.385	0.413	0.387	0.386	0.384	0.646	0.873	0.199
N	11239	7408	11202	11121	8831	11135	11239	11239

5.2 Moderating effects

5.2.1 Long-term institutional ownership and agency costs

Large cash holdings by firms are often connected to the potential agency problems that firms might face. I therefore investigate if the negative effect of long-term institutional investors is moderated by agency costs. Agency cost is defined as an inverse turnover variable.

Estimation results are reported in *Table 4*. As expected, firms with higher agency costs tend to hold more cash. For the long-term institutional investors, results are consistent with my main estimations – higher long-term institutional ownership is associated with lower cash holdings. However, the impact of long-term institutional investors on firm cash holdings increases together with the increase in agency costs. The coefficient estimates for the interaction term of long-term institutional investors with agency costs are -0.030 (with a standard error of 0.013) in the regressions on the full sample, -0.042 (with a standard error of 0.015) for non-indexers, and -0.037 (with a standard error of 0.016) for long-term institutional investors with low portfolio turnover. The interaction coefficients are also negative but not significant for indexers and long-term institutional investors with high portfolio turnover. These results support Hypothesis *H1*. In terms of economic significance, results from Column (1) suggest that a 1-standard-devaition decrease (increase) in asset turnover (inverse asset turnover) is associated with a further decrease in cash holdings by 0.52% when long-term institutional ownership at its mean (23.3%).

5.2.2 Long-term institutional ownership and industry R&D intensity

I next examine whether industry R&D intensity moderates the relationship between corporate cash holdings and long-term institutional ownership.

Columns (1), (4), and (7) of *Table 5* present results on the full sample for all long-term institutional investors, non-indexers and long-term institutional investors with low portfolio turnover respectively. My initial finding that higher shareholding by long-term institutional investors is associated with even lower cash holdings in high R&D intensity industries seems to contradict my prior results. Further differentiation between firms with low agency costs (Columns 2, 5, and 8) and high agency costs (Columns 3, 6, and 9) however shows that the effect is much larger and statistically significant only for firms with high agency costs.

Table 4. Cash holdings and agency cost

The table presents the results of OLS regressions examining how the effect of long-term institutional ownership on firm cash holdings is moderated by the severity of agency costs. The analysis is performed on the sample of the UK public firms during the period from 2000 to 2016. Long-term IO is defined as a ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least eight quarters (two years). Agency cost is an inverse asset turnover variable. Detailed definitions of all variables are reported in Appendix A Table A1. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Cash/Total Assets				
	(1)	(2)	(3)	(4)	(5)
Long-term IO	-0.137***				
	(0.022)				
Long-term IO (indexer)		-0.068			
		(0.095)			
Long-term IO (non-indexer)			-0.136***		
			(0.026)		
Long-term IO (low portfolio turnover)				-0.115***	
				(0.021)	
Long-term IO (high portfolio turnover)					0.009
					(0.064)
Agency Cost (Inverse asset turnover)	0.029***	0.022***	0.030***	0.028***	0.020***
	(0.007)	(0.006)	(0.007)	(0.006)	(0.006)
Agency Cost x Long-term IO	-0.030**				
	(0.013)				
Agency Cost x Long-term IO (indexer)		-0.085			
		(0.082)			
Agency Cost x Long-term IO (non-indexer)			-0.042**		
			(0.015)		
Agency Cost x Long-term IO (low portfolio turnover)				-0.037**	
				(0.016)	
Agency Cost x Long-term IO (high portfolio turnover)					-0.037
					(0.054)
Institutional Ownership	0.085***	-0.009	0.053***	0.037**	0.001
	(0.016)	(0.016)	(0.016)	(0.014)	(0.012)
Blockholding (5%)	0.001	0.002	0.019	0.013	0.023
	(0.018)	(0.019)	(0.019)	(0.018)	(0.020)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.390	0.419	0.391	0.391	0.388
N	11163	7374	11127	11048	8776

Table 5. Cash holdings and R&D intensity

The table presents the results of OLS regressions examining how the effect of long-term institutional ownership on firm cash holdings is moderated by industry R&D intensity and severity of agency costs. The analysis is performed on the sample of the UK public firms during the period from 2000 to 2016. Long-term IO is defined as a ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least eight quarters (two years). Agency cost is defined as high (low) if firm-specific agency cost is above (below) median value of the inverse asset turnover variable. Industry R&D intensity is mean value of R&D at the industry-year level. Detailed definitions of all variables are reported in Appendix A Table A1. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Cash/Total Assets								
	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Long-term IO	-0.095***	-0.061***	-0.121***						
	(0.017)	(0.019)	(0.027)						
Long-term IO (non-indexer)				-0.069***	-0.029	-0.109***			
				(0.018)	(0.023)	(0.028)			
Long-term IO (low portfolio turnover)							-0.053***	-0.022	-0.086***
							(0.014)	(0.017)	(0.026)
Long-term IO x Industry R&D intensity	-0.627**	-0.239	-0.726**						
	(0.226)	(0.301)	(0.291)						
Long-term IO (non-indexer) x Industry R&D intensity				-0.850***	-0.379	-0.962**			
				(0.247)	(0.357)	(0.334)			
Long-term IO (low) x Industry R&D intensity							-0.803***	-0.333	-0.861*
							(0.236)	(0.293)	(0.421)
Industry R&D intensity	0.085	-0.020	0.084	0.109	-0.001	0.117	0.079	-0.014	0.072
	(0.088)	(0.124)	(0.117)	(0.082)	(0.120)	(0.103)	(0.082)	(0.114)	(0.115)
Institutional Ownership	0.088***	0.060***	0.105***	0.051***	0.028	0.067**	0.033**	0.020	0.042*
	(0.016)	(0.019)	(0.027)	(0.016)	(0.020)	(0.023)	(0.014)	(0.016)	(0.020)
Blockholding (5%)	0.002	-0.016	0.030	0.021	-0.008	0.059*	0.014	-0.009	0.045
	(0.018)	(0.019)	(0.029)	(0.019)	(0.019)	(0.031)	(0.018)	(0.019)	(0.030)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.387	0.420	0.413	0.389	0.421	0.416	0.388	0.421	0.415
N	11239	6708	4421	11202	6692	4403	11121	6654	4362

This is consistent with the idea that long-term institutional investors closely monitor the firms they invest in and apply the pressure only in cases when the likelihood of expropriation by managers is high. These results support Hypothesis *H2*.

5.2.3 Long-term institutional ownership and industry growth opportunities

The estimation results are reported in *Table 6*. Interestingly, once industry growth opportunities are accounted for, the negative coefficient between long-term institutional ownership and firm cash holdings loses its significance. Overall, higher industry growth opportunities are associated with higher cash holdings by firms; however, this is mainly true for firms with low agency costs. At the same time, firms that operate in industries with higher growth opportunities and have long-term institutional ownership hold lower amounts of cash than firms that do not have long-term institutional investors. The effect is stronger for firms with high agency costs (coefficient estimate is -0.056 vs -0.038). These results support Hypothesis *H3*.

5.2.4 Long-term institutional ownership and firm diversification

I use the number of industries that a firm operates in to measure the degree of firm diversification. The number of industries ranges from 1 to 8 in my sample.

The estimation results are reported in *Table 7*. Consistent with previously reported results, higher long-term institutional ownership is associated with lower cash holdings by firms. This effect is more pronounced in firms with high agency costs, supporting the monitoring conjecture. At the same time, more diversified firms tend to hold less cash, though the coefficient is significant for firms with low agency costs only. I observe a moderating effect of firm diversification on firm cash holding in the presence of long-term institutional investors – the estimated coefficient is positive and significant (0.016 with a standard error of 0.005). This finding is consistent with more diversified firms facing lower risk and being more difficult to monitor. Further differentiation between firms with low and high agency costs shows that this positive effect is significant only for firms with low agency costs. The results hold for non-indexers and long-term institutional investors with low portfolio turnover, supporting Hypothesis *H4*.

Table 6. Cash holdings and industry growth opportunities

The table presents the results of OLS regressions examining how the effect of long-term institutional ownership on firm cash holdings is moderated by industry growth opportunities and severity of agency costs. The analysis is performed on the sample of the UK public firms during the period from 2000 to 2016. Long-term IO is defined as a ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least eight quarters (two years). Agency cost is defined as high (low) if firm-specific agency cost is above (below) median value of the inverse asset turnover variable. Industry Growth Opportunities (GO) is mean value of market-to-book ratio at the industry-year level. Detailed definitions of all variables are reported in Appendix A Table A1. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Cash/Total Assets								
	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Long-term IO	-0.006	0.009	-0.036						
	(0.035)	(0.039)	(0.055)						
Long-term IO (non-indexer)				0.017	0.037	-0.030			
				(0.036)	(0.040)	(0.066)			
Long-term IO (low portfolio turnover)							0.057	0.053	0.038
							(0.033)	(0.035)	(0.064)
Industry Growth Opportunities	0.023***	0.019**	0.018	0.023***	0.018**	0.017	0.023***	0.018***	0.019*
	(0.007)	(0.007)	(0.010)	(0.007)	(0.007)	(0.011)	(0.007)	(0.006)	(0.011)
Long-term IO x Industry GO	-0.053***	-0.038**	-0.056**						
	(0.015)	(0.016)	(0.025)						
Long-term IO (non-indexer) x Industry GO				-0.057***	-0.039**	-0.060*			
				(0.015)	(0.017)	(0.032)			
Long-term IO (low) x Industry GO							-0.070***	-0.044**	-0.081**
							(0.015)	(0.016)	(0.034)
Institutional Ownership	0.085***	0.057***	0.105***	0.052***	0.027	0.072***	0.035**	0.020	0.046**
	(0.016)	(0.019)	(0.027)	(0.016)	(0.020)	(0.024)	(0.014)	(0.016)	(0.021)
Blockholding (5%)	0.001	-0.015	0.025	0.019	-0.007	0.052	0.013	-0.008	0.041
	(0.018)	(0.019)	(0.030)	(0.019)	(0.020)	(0.031)	(0.018)	(0.019)	(0.031)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.387	0.421	0.413	0.388	0.421	0.415	0.388	0.422	0.415
N	11239	6708	4421	11202	6692	4403	11121	6654	4362

Table 7. Cash holdings and firm diversification

The table presents the results of OLS regressions examining how the effect of long-term institutional ownership on firm cash holdings is moderated by industry growth opportunities and severity of agency costs. The analysis is performed on the sample of the UK public firms during the period from 2000 to 2016. Long-term IO is defined as a ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least eight quarters (two years). Agency cost is defined as high (low) if firm-specific agency cost is above (below) median value of the inverse asset turnover variable. Diversification is the number of industries a firm operates in (spans from 1 to 8). Detailed definitions of all variables are reported in Appendix A Table A1. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Cash/Total Assets								
	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Long-term IO	-0.163***	-0.133***	-0.181***						
	(0.023)	(0.029)	(0.036)						
Long-term IO (non-indexer)				-0.143***	-0.096**	-0.181***			
				(0.028)	(0.035)	(0.048)			
Long-term IO (low portfolio turnover)							-0.135***	-0.095***	-0.151***
							(0.027)	(0.033)	(0.044)
Diversification	-0.004	-0.006**	-0.004	-0.003	-0.005*	-0.003	-0.003	-0.005*	-0.003
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.002)	(0.002)	(0.004)
Long-term IO x Diversification	0.016***	0.019***	0.012						
	(0.005)	(0.006)	(0.009)						
Long-term IO (non-indexer) x Diversification				0.015**	0.016**	0.011			
				(0.006)	(0.006)	(0.012)			
Long-term IO (low) x Diversification							0.017**	0.017**	0.011
							(0.006)	(0.006)	(0.011)
Institutional Ownership	0.086***	0.054**	0.104***	0.051***	0.024	0.070**	0.034**	0.019	0.043*
	(0.017)	(0.019)	(0.027)	(0.016)	(0.019)	(0.024)	(0.014)	(0.016)	(0.021)
Blockholding (5%)	0.004	-0.012	0.028	0.021	-0.006	0.054*	0.015	-0.007	0.043
	(0.018)	(0.019)	(0.029)	(0.019)	(0.020)	(0.031)	(0.018)	(0.019)	(0.030)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.386	0.422	0.412	0.387	0.421	0.414	0.387	0.422	0.414
N	11239	6708	4421	11202	6692	4403	11121	6654	4362

5.3 Additional robustness

Given that internal corporate governance mechanisms can exacerbate or mitigate agency costs, I control for the role of board structure (size and independence) and CEO power. In particular, I control for Independent Non-Executive Directors (NED) on the Board (% Independent NED), Board Size, Board Size2 and CEO duality that might affect cash holdings. The estimation results are reported in *Table 8*. Overall, my results are robust after controlling for these main corporate governance characteristics in the main models. In additional models, I controlled also for additional CEO characteristics and my results are still robust.

Table 8. Corporate governance controls (robustness)

The table presents the results of OLS regressions examining the effect of long-term institutional ownership on firm cash holdings for the sample of the UK public firms during the period from 2000 to 2016. Long-term IO is defined as a ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least eight quarters (two years). Detailed definitions of all variables are reported in Appendix A Table A1. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Cash/Total Assets				
	OLS	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)
Long-term IO	-0.107***				
	(0.019)				
Long-term IO (indexer)		0.044			
		(0.070)			
Long-term IO (non-indexer)			-0.105***		
			(0.019)		
Long-term IO (low portfolio turnover)				-0.072***	
				(0.018)	
Long-term IO (high portfolio turnover)					-0.015
					(0.050)
CEO Duality	-0.013	-0.014	-0.013	-0.013	-0.013
	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)
Independent NED in Board (%)	0.038**	0.022	0.041**	0.039*	0.028
	(0.018)	(0.020)	(0.018)	(0.018)	(0.017)
Board Size	0.001	-0.009	0.002	0.000	0.005
	(0.007)	(0.007)	(0.007)	(0.007)	(0.005)
Board Size^2	-0.000	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Institutional Ownership	0.088***	-0.002	0.059***	0.034**	-0.001
	(0.019)	(0.016)	(0.016)	(0.015)	(0.014)
Blockholding (5%)	0.003	-0.004	0.025	0.015	0.024
	(0.018)	(0.015)	(0.019)	(0.019)	(0.020)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.385	0.413	0.387	0.386	0.384
N	7296	5010	7288	7245	5921

6. Conclusion

This study extends the existing literature on cash holdings by providing novel empirical evidence in relation to the effect of the proportion of long-term institutional ownership on cash holdings in the UK over time. I build on economic perspectives, the behavioural theory and the value-creation versus value-appropriation literatures and explore the moderating role of contexts, while accounting for the magnitude of agency costs. My findings show that long-term institutional investors' ownership is associated with lower firms' cash holdings and that this negative relationship is significantly more pronounced for firms with high agency costs. I further show that the decision of long-term institutional investors to monitor opportunistic managers depends on the magnitude of the agency costs and is driven by the implications of cash for firm performance that are context specific (i.e. the degree of firm diversification, industry R&D intensity and industry growth opportunities). Overall, my findings support my predictions and provide novel evidence on the monitoring role of long-term institutional investors' ownership through the cash holding channel in different contexts.

Beyond the scope of this study, the documented empirical evidence suggests new directions and potential avenues for future research. First, as this paper finds the magnitude of the agency costs could aggravate or alleviate the negative relationship between long-term institutional ownership and firms' cash holdings and that large cash holdings are often connected to potential problems (Jensen, 1986), an interesting research question might be as follows: does the impact of long-term institutional ownership on cash depend on the level of cash that firm holds?

Second, this study suggests that the monitoring role of long-term institutional investors is driven by the implications of cash for firm performance. Thus, what is the relationship between the presence of long-term institutional investors and the value of firms' cash holdings?

Third, the interplay between different theories and perspectives enables this study to enrich our understanding of how the firms' contexts and characteristics determine the relevance of theory being adopted to explain corporate cash holdings. Adopting a multi-view approach could contribute to the literature of cash holdings. For example, prior studies find that firms with high information asymmetry hold more cash as external capital might be costly for such firms. However, from investors' view, the risk of value-appropriation increases with information asymmetry as with agency concerns. Thus, do institutional investors pay more

attention in monitoring corporate policies of firms with higher information asymmetry and agency concerns?

Fourth, the findings of this study support recent research on the importance of considering the heterogeneity of institutional investors when studying their monitoring role and the influence on firms' policies.

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Essay 2. Institutional investors' investment horizon and cash deviation from the optimal level of cash*

Abstract

Using all UK listed firms in the London Stock Exchange for the period 2000–2016, this study investigates the effects of institutional investors' investment horizon on the cash deviation from the optimal level of cash. Incorporating agency concerns and the precautionary needs for cash holdings, I argue that the effect of long-term institutional investors on cash holdings depends on the cash deviation from the optimal level of cash. On the one hand, I find that long-term institutional ownership is negatively associated with cash holdings only for firms with excess cash; on the other hand, firms with a high presence of long-term institutional investors increase cash when they hold cash below the optimal level. I further show that long-term institutional ownership is associated with a higher value of cash holdings. This study also shows that long-term institutional ownership has a positive moderating effect on the negative relationship between excess cash and a firm's operating performance. Overall, my findings support my predictions on the positive monitoring role of long-term institutional investors on how much cash firms hold, how firms use cash, and how much cash contributes to firm value. I provide several robustness tests for my findings.

Keywords: *Cash deviation, institutional ownership, investment horizon, optimal level of cash, value of cash holdings and excess cash*

*This paper has been peer-reviewed and accepted at the 6th Annual International Corporate Governance Society Conference – ICGS 2020 where it has been presented on November 2020.

1. Introduction

Research on corporate cash holdings has been one of the central topics in corporate finance literature during the last few decades, especially in the last twenty years since the publication of influential articles by Kim, Mauer and Sherman (1998) and Opler et al. (1999). Amess, Banerji and Lampousis (2015) argue that the increase in interest for this topic can be attributed to the boost in corporate cash holdings around the world. For example, Graham and Leary (2018) show that corporate cash holdings have been increasing in the US since the 1970s, and have reached 22.6% of total corporate assets during the last two decades. Similarly, in the UK, while, on average, cash holdings represented 9.9% of firms' total assets during the 1990s (Ozkan and Ozkan, 2004), it has represented 13.7% during the last two decades (Farinha, Mateus and Soares, 2018). Similar trends have been documented in other developed countries (Schauten, van Dijk and van der Waal, 2013; Karpuz, Kim and Ozkan, 2020). Emerging markets show consistent evidence: For example, Chen et al. (2012) report that the percentage of cash to total assets is 20% in China. Private firms also show high figures, such as 9.39% in the US (Gao, Harford and Li, 2013) and about 10% in Italy (Bigelli and Sánchez-Vidal, 2012).

Despite several studies designed to identify cash holdings motives based on the costs and benefits of holding cash, the data are still inconclusive and scholars have called for additional studies on this topic (Lin and Chiu, 2017; Weidemann, 2018; Bates, Chang and Chi, 2018). In particular, while there are several motives, such as precautionary and transaction motives (Keynes, 1936), that are driving firms to increase cash holdings, firms pay attention to the costs that are associated with holding cash [i.e. the cost of carry and spending hypothesis suggested by Jensen and Meckling (1976)]. Balancing between the costs and benefits of holding cash, Opler et al. (1999) suggest that firms can reach an optimal level of cash holdings by trading off between such costs and benefits. Since Opler et al.'s (1999) study, a considerable amount of empirical evidence has supported the existence of the optimal level of corporate cash to which firms intentionally adjust their cash holdings towards (Ozkan and Ozkan, 2004; Dittmar and Duchin, 2010; Gao, Harford and Li, 2013; Lozano and Durán, 2017; Bates, Chang and Chi, 2018). Hence, according to these studies, firms actively decrease or increase their cash holdings to reach the optimal cash level—but why?

Indeed, recent studies have shown that cash deviation from its optimal level decreases a firm's value (Harford, Mansi and Maxwell, 2008; Martínez-Sola, García-Teruel and Martínez-Solano, 2013; Lin and Chiu, 2017) and a firm's future performance (Dittmar and

Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013; Chen and Shane, 2014; Oler and Picconi, 2014). Distinguishing between positive and negative deviations,[6] both positive and negative cash deviations decrease the next year's return on net operating assets (RNOA), cumulative abnormal returns (CAR) (Oler and Picconi, 2014), and a firm's future earnings (Chen and Shane, 2014). This negative effect of cash deviation on a firm's performance might be explained by two views.

The first standpoint is the agency view, which is more suitable to explain positive cash deviation, when firms hold excess cash. Based on this view, excess cash increases agency costs (Jensen, 1986). In addition, Harford, Mansi and Maxwell (2008) find that firms with excess cash will have lower profitability and valuations if the governance structures of these firms are weak (i.e. spending hypothesis). Dittmar and Mahrt-Smith (2007) and Schauten, van Dijk and van der Waal (2013) find that firms with weak governance structures diminish future operation performance by spending their excess cash holdings inappropriately.

The second idea is the precautionary motive view, which is more suitable to explain negative cash deviation, when firms hold insufficient cash. Based on this view, the negative effect of negative cash deviation may be attributed to the fact that firms with insufficient cash may lose the opportunity to undertake unforeseen profitable investments (Keynes, 1936). Indeed, Harford, Klasa and Maxwell (2014) show that holding a low level of cash exposes firms to higher refinancing risk. Hence, the aforementioned papers suggest that holding either excess or insufficient amounts of corporate cash decreases a firm's overall future value.

Previous corporate cash holding studies heavily use both precautionary and agency views as the underlying arguments when studying corporate cash policies, but by examining these motives separately (Amess, Banerji and Lampousis, 2015). This study aims to incorporate both agency and precautionary views to gain a better understanding of corporate cash policies. In particular, I argue that institutional investors, especially long-term investors, perceive both agency and precautionary motives simultaneously when interacting in order to influence a firm's cash policy. On the one hand, the agency motive pushes long-term institutional investors

[6] Positive (negative) cash deviation means when cash is above (below) the optimal level and equivalent to an excess (insufficient) cash level, as used by Dittmar and Duchin (2010) and others.

to decrease cash holding when firms hold excess cash. On the other hand, the precautionary motive pressures them to increase the cash level when firms hold insufficient cash.

Over the last six decades, the level of shares owned by institutional investors has increased in many countries around the world, especially in Anglo-American countries. Recent evidence shows that the total financial assets held by institutional investors increased from 79% of gross domestic product (GDP) to 413% between 1960 and 2016 (OECD, 2017). Consequently, these major increases in both corporate cash and institutional ownership have motivated several scholars to study the effect of institutional ownership on firms' cash policies.

On the one hand, previous studies building on agency motive argue that institutional investors with longer investment horizons are effective monitors (Bushee, 1998; Chen, Harford and Li, 2007; Harford, Kecskés and Mansi, 2018, Yin, Ward and Tsolacos, 2018). Specifically, they can mitigate agency problems and eventually enhance corporate cash policies by decreasing cash holdings. On the other hand, other studies building on the precautionary view argue that, as long-term institutional investors' main aim is maximizing the long-term value of the firm (Bushee, 1998; Derrien, Kecskés and Thesmar, 2013; Harford, Kecskés and Mansi, 2018), such investors will encourage the firms to increase cash holdings to hedge against the risks that are associated with having insufficient cash. Over time, these views have generated extensive debate, but the results of previous studies are mixed and have failed to support the main assumptions of these views (Bates, Kahle and Stulz, 2009).

In this paper, I aim to contribute to this debate by combining both views. I argue that the effect of an institutional investor's investment horizon on corporate cash policy depends on the level of cash deviation from the optimal level. I build on the agency and precautionary views to posit that long-term institutional investors will decrease the firm's overall cash deviation by either decreasing excess cash holdings to reach a firm's optimal cash level (i.e. agency view) or increasing insufficient cash holdings to reach a firm's optimal cash level (i.e. precautionary view). My results support the agency view when a firm has positive deviation (i.e. excess cash) and the precautionary view when a firm has negative deviation (i.e. insufficient cash).

As cash deviation has a negative effect on a firm's value and operating performance, and I argue that long-term institutional ownership decreases the cash deviation, I then expect that the negative relationship between cash deviation and a firm's value is positively moderated

by long-term institutional ownership. To this end, I start to investigate the effect of long-term institutional investors on the marginal value of each additional dollar raised by a firm. Firms with good corporate governance use their cash more efficiently (Harford, Mansi and Maxwell, 2008), which translates to a higher value of cash than poorly governed firms (Dittmar and Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013). Moreover, firms incorporated in countries with strong governance have a higher value of cash than firms in countries with poor governance (Pinkowitz, Stulz and Williamson, 2006). Thus, I hypothesize that the higher presence of long-term institutional investors is associated with a higher marginal value of cash holdings by firms.

In addition, I further focus on the effect of long-term institutional ownership on the use and value of excess cash rather than total cash holdings. Using excess cash ensures that I only account for the change in cash that is not related to the determinants of the optimal level (Dittmar and Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013; Chen and Shane, 2014). As excess cash holdings are a potential agency concern, one may expect that well-governed firms with excess cash will decrease their cash holdings to the optimal level more aggressively than poorly governed firms. However, the rapid dissipating of excess cash is associated with value-decreasing investments (Harford, 1999; Harford, Mansi and Maxwell, 2008) and lower future operating performance (Dittmar and Mahrt-Smith, 2007). Therefore, I posit that firms with excess cash and a high proportion of long-term institutional ownership will adjust their cash holding to the optimal level through less accumulation of more cash and efficient dissipation of the current excess cash on value-creating investments.

Using panel data for all UK firms listed in the London Stock Exchange during the period 2000–2016, I use a two-step regression to test my hypothesis on the effect of long-term institutional ownership on the cash deviation. This method has been used in recent accounting and finance studies to mainly observe the effect of the variable of interest on the discretionary component of the dependent variable (Chen, Hribar and Melessa, 2018). I first estimate the optimal level of cash for each firm using Opler et al.'s (1999) model. I then investigate the factors pushing firms to move cash towards its optimal level. My main variable of interest is the institutional investors' investment horizon. Following recent studies, I use the length of an investor's holding period for specific stock as a proxy for the investor's investment horizon (Elyasiani and Jia, 2010; Attig et al., 2012; Wang, 2014). I further employ the excess return model of Faulkender and Wang (2006) and the market-to-book model of Fama and French

(1998) to study the moderating role of long-term institutional investors on the value of cash holdings and the value of excess cash. Finally, I follow Dittmar and Mahrt-Smith (2007) and Schauten, van Dijk and van der Waal (2013) in studying the moderating effect of long-term institutional ownership on the use of excess cash and firms' operating performance.

My findings support hypotheses on the positive monitoring role of long-term institutional investors on corporate cash policies. First, I find that long-term institutional ownership is associated with smaller cash deviation from the optimal cash level. This suggests that long-term institutional investors constantly consider a firm's optimal level and urge them to move cash towards its optimal level. I further test the sensitivity of this effect by differentiating between excess cash and cash deficit. My results show that long-term institutional ownership has a highly significant negative coefficient on cash holdings when firms have an excess of cash; conversely, long-term institutional ownership significantly increases the change in cash when firms have a cash deficit.

Second, I find that the relationship between the change in cash and firm value is positively moderated by long-term institutional ownership. Moreover, I find that firms with a high proportion of long-term institutional investors and excess cash efficiently dissipate their excess cash on value-creating investments. Overall, my findings are consistent with the existing literature that suggests long-term institutional investors are effectively and/or actively monitoring firms' decisions (Harford, Kecskés and Mansi, 2018).

This study makes several contributions. First, it contributes to the cash holding literature by focusing on the deviation of cash holdings. Previous literature has extensively studied the determinants of cash level. In contrast, this study investigates what causes a firm to deviate from its optimal level. In particular, the use of the cash deviation has two distinctive merits. The first merit is that cash deviation enables us to test the discretionary or the unexplained component of cash that is not explained by the firm's fundamental needs for cash. Since Opler et al.'s (1999) study on the main determinants of corporate cash, most studies in the cash literature have emphasized the validity of these determinants to explain a firm's cash policies in different contexts and periods. Importantly, recent studies find that the unexplained component of cash by these determinants has a significant negative effect on a firm's value.

The second merit is that cash deviation is a suitable variable for capturing both the agency view and precautionary view of corporate cash. I build on the agency view to explain

cash policy when firms have cash above the optimal level (i.e. excess cash), and then I build on the precautionary view to explain cash policy when firms have an insufficient amount of cash holdings.

Second, I provide additional evidence on the effect of institutional investors' investment horizon on corporate cash policy. Studying the investment horizon of institutional investors and cash deviation together enables us to test the heterogonous effect of institutional ownership on cash. Therefore, my results can help explain the contradictory findings in the literature on the effect of institutional investment horizon on cash policy. While Harford, Kecskés and Mansi (2012) and Huang and Petkevich (2016) find the higher presence of long-term institutional investors is associated with higher level of cash, Cleary and Wang (2017) and Harford, Kecskés and Mansi (2018) find that long-term institutional ownership decreases cash holdings, although the latter study shows a negative, but not a statistically significant, coefficient estimate. Conversely, I find that the effect of long-term institutional ownership on cash depends on how a firm's cash holdings deviate from its optimal level. While this study shows consistent and robust results on the positive moderating effect of long-term institutional ownership on the value of cash holdings, the existing literature has failed to provide significant, but also consistent results (Harford, Kecskés and Mansi, 2012; Im et al., 2018; Ward, Yin and Zeng, 2018)

Lastly, this study provides a comprehensive investigation on the effect of institutional investors' investment horizon on corporate cash policy within a single recent context. Bates, Kahle and Stulz (2009) show a consistent increase in corporate cash holdings since the 1980s, and this increase can be explained by the changes in firm characteristics over time. Bates, Chang and Chi (2018) further show that the value of each $1 of cash increased from $0.61 in the 1980s to $1.12 in the 2000s and the speed of adjustment in cash holdings towards the optimal level decreased during the same period; the authors attribute these trends to several market and corporate factors depending on the period of time. Thus, using one context for a recent period to comprehensively study the effect of long-term institutional ownership on cash level, the value of cash and the use of excess cash, can help extend the existing literature with comprehensive and consistent results.

The rest of the paper is organized as follows: Section 2 presents the theoretical background and hypotheses development, Section 3 presents the econometric specifications,

Section 4 outlines the data sources and variable measurement, Section 5 reports the estimation results and some robustness tests, and Section 6 provides a conclusion.

2. Literature Review and Hypotheses Development

Previous studies have shown that long- and short-term investors are heterogeneous in trading behaviour, monitoring effectiveness, firms' funding policies, and firms' investment policies. Unlike long-term institutional investors, short-term institutional investors frequently change their holding positions in response to good or bad news (Hotchkiss and Strickland, 2003) and during periods when the CBOE Volatility Index is increased (Cella, Ellul and Giannetti, 2013). Chen, Harford and Li (2007) document that long-term institutional investors benefit from their long position in the firm, as they use the information they have about the firm to enhance firm performance. Borochin and Yang (2017) find confirming evidence that long-term institutional investors have information advantage, are associated with less future misevaluation and better future corporate governance. Prior studies also suggest that long-term institutional investors effectively monitor a firm's policies (Bushee, 1998; Harford, Kecskés and Mansi, 2018) and actively engage with a firm's management and board (McCahery, Sautner and Starks, 2016).

Turning to a firm's financing decisions, prior empirical evidence confirms the heterogeneous effects of short- and long-term institutional investors on the financing policies of the firm. Firms with higher long-term institutional ownership use more external debt (Huang and Petkevich, 2016; Cleary and Wang, 2017) and more internal funding (i.e. retained earnings) (Huang and Petkevich, 2016), but less external equity (Huang and Petkevich, 2016; Harford, Kecskés and Mansi, 2018) and less seasoned equity (Hao, 2014). The institutional investors' investment horizon also influences firms' investment decisions. Firms with a high proportion of long-term institutional ownership invest more in investments that maximize the long-run value of the firm such as R&D (Bushee, 1998) and innovations (Harford, Kecskés and Mansi, 2018) while firms that experience a large exogenous increase in short-term institutional ownership reduce R&D investments (Cremers, Pareek and Sautner, 2020). Indeed, Yin, Ward and Tsolacos (2018) find that a higher presence of long-term institutional investors is associated with not only a positive, but also a long-lasting, effect on firm performance, and Neubaum and Zahra (2006) find that long-term institutional ownership is positivity associated with corporate social performance.

Regarding the effect of the institutional investors' investment horizon on a firm's cash policies, contradictory results have been documented in the literature. On the one hand, Cleary and Wang (2017) argue that, because of the positive monitoring role of long-term institutional investors in reducing agency and information asymmetry problems, long-term institutional ownership is associated with lower cash holdings. Harford, Kecskés and Mansi (2018) also document a negative, but not significant, coefficient on the effect of long-term institutional ownership on cash holdings. On the other hand, Harford, Kecskés and Mansi (2012) find that firms with a high presence of long-term institutional investors hold more cash holdings as opportunistic managers are less likely to misuse cash in such firms. Moreover, Huang and Petkevich (2016) show that both short-term and long-term institutional ownership have positive significant effect on cash holdings, although the effect is larger in firms with higher short-term institutional ownership. They attribute this difference to the fact that investors with different investment horizons seek different types of information. They argue that long-term institutional investors seek value-enhancing information, while short-term investors focus on collecting value-neutral information. Thus, the existing empirical studies provide contradictory results on the effect of institutional investors' investment horizon on corporate cash holdings, and they explain their findings with different theoretical arguments.

Indeed, I argue that focusing not only on the cash level, but also on the cash deviation can help to explain such mixed findings in the literature. I argue that using cash deviation will provide a deeper understanding of the effect of institutional investors' investment horizon on cash holdings. In terms of cash deviation, I can distinguish between positive deviation (i.e. excess cash) and negative deviation (i.e. cash deficit). On the one hand, I expect that long-term institutional investors will decrease excess cash level to minimize the agency cost of having a high amount of cash in the hands of a manager (i.e. agency view). On the other hand, as long-term institutional investors are more linked to a firm's financial health and long-run value (i.e. precautionary view), they will encourage managers to increase the cash holdings when the cash level is insufficient. Combining both expectations, I argue that long-term institutional investors monitor a firm to hold the level of cash that is needed to meet its fundamental investments and operations (i.e. the optimal cash level).

Agency motive suggests that firms with a higher amount of cash holdings are exposed to higher agency costs (Jensen, 1986). The ownership of institutions can reduce such costs via effective monitoring and active engagement. For example, previous studies have shown that

institutional investors closely monitor managers' actions to ensure efficient use of cash (Harford, Mansi and Maxwell, 2008), which ultimately leads to a higher value of cash holdings (Dittmar and Mahrt-Smith, 2007). Recent literature emphasizes that both the quality of monitoring and the efficiency of engagement of institutional investors are varied based on their investment horizons (McCahery, Sautner and Starks, 2016). In the context of cash holding policies, Cleary and Wang (2017) argue the effect of institutional ownership in decreasing a firm's cash holdings is attributed to long-term investors rather than short-term investors. In addition to the potential agency costs that are often connected to large cash holdings, other costs of cash holdings include a low rate of return and possible tax disadvantages (Opler et al., 1999; Foley et al., 2007). Moreover, recent literature documents that excess cash holdings are associated with a lower value of cash and operating performance (Dittmar and Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013; Chen and Shane, 2014; Oler and Picconi, 2014), and then ultimately lower firm value (Harford, Mansi and Maxwell, 2008; Martínez-Sola, García-Teruel and Martínez-Solano, 2013). Therefore, my first sub-hypothesis is as follows:

Sub-Ha: *The presence of long-term institutional investors decreases the excess cash; in other words, long-term institutional ownership decreases positive deviation of cash from its optimal level.*

However, prior research finds that firms with less cash holdings are more sensitive to their cash flows (Almeida, Campello and Weisbach, 2004) and more likely to fail to undertake value-creating investment opportunities (Denis and Sibilkov, 2010). Moreover, firms are exposed to more refinancing risk when they hold a lower amount of cash holdings (Harford, Klasa and Maxwell, 2014). Considering that the risk-taking behaviours of large investors might influence a firm's cash policies (Boubaker, Nguyen and Rouatbi, 2016), and that different types of owners have different risk-taking behaviours towards cash policies (Anderson and Hamadi, 2016), I expect that long-term institutional investors will be more risk averse than other investors towards cash policies and encourage a firm to hold more cash. In terms of a firm's performance, the effect of holding insufficient cash is even more harmful than holding excess cash on the firm's future performance (Chen and Shane, 2014; Oler and Picconi, 2014). As long-term institutional investors are more concerned about the long-run value and health of their investee firms, my second sub-hypothesis is as follows:

Sub-Hb: *The presence of long-term institutional investors decreases cash deficit; in other words, long-term institutional ownership decreases negative deviation of cash from its optimal level.*

Recent studies examine the effect of the cash deviation from the optimal cash level on firm value. These studies find consistent results that suggest the importance for firms to maintain the optimal cash level. For example, Oler and Picconi (2014) examine the effect of cash deviation on future firm performance using a sample of US public firms over the period 1989–2008. They find that the cash deviation has a significant negative effect on both RNOA and CAR.

Chen and Shane (2014) distinguish between two types of changes in corporate cash holdings, 'normal' and 'abnormal' changes. The normal changes are the changes in cash towards the optimal level of cash. By contrast, the abnormal changes are the changes in cash that are not derived from a firm's fundamental investing and operating needs. Chen and Shane (2014) document that only the abnormal changes in cash have a negative and significant effect on a firm's future performance. Using Tobin's Q as a proxy for firm value, both Harford, Mansi and Maxwell (2008) and Martínez-Sola, García-Teruel and Martínez-Solano (2013) find consistent evidence that cash deviation reduces firm value. In the context of institutional investors' investment horizon, Bushee (2001) finds that while short-term institutional investors seek short-run earnings, long-term institutional investors focus on the long-run health and value of the firm. A recent survey by McCahery, Sautner and Starks (2016) confirms that long-term institutional investors actively engage in a firm's policies, and one of the triggers of the engagement is low payments to shareholders despite the firm having high cash holdings. I therefore hypothesize:

H1: *The presence of long-term institutional investors decreases both excess and insufficient cash level from its optimal level; in other words, long-term institutional ownership decreases cash deviation from its optimal cash level.*

If the presence of long-term institutional investors is associated with lower cash deviation, and the cash deviation has a negative effect on firm value, I then posit that firms with a higher proportion of long-term institutional ownership will have a higher value of cash holdings. The existing literature provides consistent results that the relationship between the

change in cash holdings and firm value is positively moderated by the quality of governance at country level (Pinkowitz, Stulz and Williamson, 2006; Schauten, van Dijk and van der Waal, 2013; Thakur and Kannadhasan, 2019) and firm level (Dittmar and Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013; Deb, David and O'Brien, 2017). However, while institutional ownership is often used as a measure of corporate governance in the cash holdings literature (Dittmar and Mahrt-Smith, 2007; Harford, Mansi and Maxwell, 2008; Harford, Kecskés and Mansi, 2012; Bates, Chang and Chi, 2018a; Im et al., 2018; Ward, Yin and Zeng, 2018), prior studies report inconsistent results on the effect of institutional ownership on the value of cash holdings.

In particular, while Dittmar and Mahrt-Smith (2007) find that institutional blockholding is associated with a higher value of cash, Bates, Chang and Chi (2018) also find that this relationship existed during the 1990s, but that institutional blockholding had a negative, but not statistically significant, effect on the value of cash during the 2000s.

Recent studies further differentiate between institutional investors based on their investment horizon, but still report mixed results. For example, Harford, Kecskés and Mansi (2012) study the effect of long-term institutional investors (i.e. investors with low portfolio turnover) on the value of cash, and they find a positive significant effect for only long-term indexers and not all long-term institutional investors. Adopting Bushee's (1998) classification, while Im et al. (2018) and Ward, Yin and Zeng (2018) interestingly find that short-term institutional investors (i.e. transient investors) have a positive effect on the value of cash, they report both a negative and positive, but not significant, effect of long-term institutional investors (i.e. dedicated investors). Despite these studies' focus on US firms and their use of alternative measures for institutional investors' investment horizon, they failed to provide consistent results. This study aims to provide additional evidence; however, I use another interesting institutional context (i.e. the UK) and adopting a new measure of investors' investment horizon based on investee firm level rather than investors' overall portfolio turnover. Therefore, I hypothesize:

H2: *The presence of long-term institutional investors positively moderates the relationship between the change in cash and a firm's value; in other words, long-term institutional ownership increases the value of cash holdings.*

Building on the potential agency costs that are associated with large cash holdings (Jensen, 1986), the recent literature on corporate governance and cash holdings focuses on the use of excess cash. Studies find that the value of excess cash is higher in countries with a strong governance environment (i.e. with developed markets, low corruption and better information asymmetry) compared with countries with a weak governance environment (Drobetz, Grüninger and Hirschvogl, 2010; Kusnadi, 2019). Frésarda and Salva (2010) find that investors value excess cash at a premium for well-governed firms as it is expected to be used efficiently.

Consistent with the spending hypothesis (Jensen and Meckling, 1976), Harford, Mansi and Maxwell (2008) find that poorly governed firms with excess cash are associated with higher spending in capital expenditure and acquisitions, but with lower profitability and firm value. While Harford (1999) finds that firms with excess cash dissipate their cash in value-decreasing acquisitions, Gao and Mohamed (2018) confirm these findings—but only if the acquirer firm is poorly governed. Moreover, Gao, Harford and Li (2013) compare public and private firms to find that well-governed public firms spend their excess cash in value-creating long-run investments (i.e. R&D). Dittmar and Mahrt-Smith (2007) and Schauten, van Dijk and van der Waal (2013) find that the negative effect of excess cash on future operating performance is positively moderated with the quality of a firm's governance through the efficient use of the excess cash. Therefore, I hypothesize:

H3: *The presence of long-term institutional investors positively moderates the relationship between excess cash and a firm's operating performance; in other words, long-term institutional ownership increases the value of excess cash through value-creating investments.*

3. Econometric Specifications

3.1 Cash deviation

As this study intends to particularly explain the unexplained portion of cash holdings, I follow a large body of the accounting and finance literature and employ a two-step regression procedure to study the cash deviation [for a recent empirical review of studies that have used this procedure, see Chen, Hribar and Melessa (2018)]. Under this procedure, the dependent variable can be divided into two parts: explained and unexplained parts. The explained part refers to the part predicted by a first-step regression, which regresses the dependent variable on some primary explanatory variables; and the unexplained part refers to the difference

between the actual values of the dependent variable and the predicted values by first-step regression. In other words, the fitted values that are predicted by the first-step regression represent the explained part, and the residuals from this regression represent the unexplained part. Then, the second-step regression regresses these residuals on new independent variables of interest. Equation (1) is the first-step model to estimate the optimal cash level.

$$C_{it} = \beta_0 + \beta_1 X_{it} + \varphi_j + \tau_t + \epsilon_{it}, \quad (1)$$

where C denotes the ratio of cash and cash equivalents to the book value of total assets of firm *i* at time *t*. ϵ is the residual (or the fitted deviation), that is, the difference between the actual cash level and the predicated optimal level *C**. *X* is a set of main determinants of corporate cash level (Opler et al., 1999; Bates, Kahle and Stulz, 2009; Bates, Chang and Chi, 2018): firm size, leverage, market-to-book ratio, cash flow, industry cash flow volatility, net working capital (NWC), capital expenditure, R&D, acquisitions, and dividend. φ and τ are industry and year fixed effects, respectively. Thus, Equations (2) and (3) show the numerical version of the cash deviation variable and the absolute cash deviation, respectively.

$$Dev_{it} = C_{it} - C_{it}^{*} = \widehat{\epsilon_{it}}. \quad (2)$$

$$|Dev_{it}| = |C_{it} - C_{it}^{*}| = |\widehat{\epsilon_{it}}|. \quad (3)$$

While Equation (1) represents the first-step regression, I use the second-step regression to test my first hypothesis *H1*, and the model specification is as follows:

$$|Dev_{it}| = \beta_0 + \beta_1 LTIO_{it} + \beta_2 X_{it} + \varphi_j + \tau_t + \epsilon_{it}, \quad (4)$$

where $LTIO$ denotes the long-term institutional ownership. X is a set of cash determinants used to estimate the optimal cash level in Equation (1). φ and τ are industry and year fixed effects, respectively. ϵ is the error term. I include the explanatory variables from the first-stage model into the second-stage model to eliminate the potential bias associated with a two-step procedure (Chen, Hribar and Melessa, 2018).[7]

[7] Chen, Hribar and Melessa (2018) review 61 studies that apply a two-step regression procedure and find that this procedure might lead to biased coefficients. They suggest three possible approaches to eliminate the biases, one of which is to include the first-step regression's explanatory variables as control variables in the second-step regression. Though their study was focusing on using the residuals from the first-step model without any transformation or partition, they advise caution even if transformed or partitioned residuals have been used as dependent variables.

3.2 Value of cash holdings

To test my hypothesis H2 on the relationship between long-term institutional ownership and the value of cash holdings, I employ the excess return model of Faulkender and Wang (2006), which has been widely used in corporate governance and cash value literature (Dittmar and Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013; Bates, Chang and Chi, 2018; Ward, Yin and Zeng, 2018). Thus, I estimate the following specification:

$$\begin{aligned} \boldsymbol{r_{it} - R_{it}^{B} = \beta_0 + \beta_1 LTIO_{it} \times \frac{\Delta C_{it}}{ME_{it-t}} + \beta_2 LTIO_{it} + \beta_3 \frac{\Delta C_{it}}{ME_{it-t}} + \beta_4 \frac{\Delta E_{it}}{ME_{it-t}} +} \\ \boldsymbol{\beta_5 \frac{\Delta NA_{it}}{ME_{it-t}} + \beta_6 \frac{\Delta RD_{it}}{ME_{it-t}} + \beta_7 \frac{\Delta I_{it}}{ME_{it-t}} + \beta_8 \frac{\Delta D_{it}}{ME_{it-t}} + \beta_9 \frac{C_{it-1}}{ME_{it-t}} + \beta_{10} \frac{\Delta C_{it}}{ME_{it-t}} \times \frac{C_{it-1}}{ME_{it-t}} +} \\ \boldsymbol{\beta_{11} \frac{L_{it}}{MV_{it-t}} + \beta_{12} \frac{\Delta C_{it}}{ME_{it-t}} \times \frac{L_{it}}{MV_{it-t}} + \beta_{13} \frac{NF_{it}}{ME_{it-t}} + \epsilon_{it},} \end{aligned} \quad (5)$$

where ΔX denotes a change in X from time $t-1$ to t. r_{it} is stock return over one year $t-1$ to t. R_{it}^{B} is Fama and French's (1993) 25-size and book-to-market matched portfolio return over one year $t-1$ to t. ME is market value of equity. C is cash and cash equivalents. E is earnings before extraordinary items. NA is net assets (total asset – cash and cash equivalents). RD is research and development expenses. I represents interest expenses. D is common dividends. L is total debt (short and long debt). MV is market value of equity plus total debt. NF is net new equity issues plus net new debt issues. $\boldsymbol{\epsilon}$ is the error term.

I am interested in the coefficient β_1, which represents the moderating effect of long-term institutional ownership on the relationship between the change in cash holdings and stock excess return. To gain a more intuitive interpretation for this coefficient, I follow Dittmar and Mahrt-Smith (2007) and use a binary dummy variable to distinguish between firms with a high proportion of long-term institutional ownership versus firms with a low proportion. I use the top and bottom quartiles of long-term institutional ownership to construct such a binary variable. In separate regressions, I also use the ratio of long-term institutional ownership instead of the dummy variable. In further analysis, I also re-estimate Equation (5) excluding $LTIO$, but instead estimating the model for two subsamples of high (top quartile) and low (bottom quartile) long-term institutional ownership.

3.3 Use of excess cash and operating performance

To test hypothesis *H3* on the moderating effect of long-term institutional ownership on the relationship between excess cash and a firm's operating performance, I adopt the approach of Dittmar and Mahrt-Smith (2007) and estimate the following specification:

$$\boldsymbol{RONA_{it} = \beta_0 + \beta_1 LTIO_{it-1} \times \frac{Dev_{it-1}}{NA_{it-1}} + \beta_2 LTIO_{it-1} + \beta_3 \frac{Dev_{it-1}}{NA_{it-1}} + \beta_4 RONA_{it-1} + \beta_5 NA_{it} + \beta_6 \frac{PP\&E_{it}}{NA_{it}} + \varphi_j + \tau_t + \epsilon_{it},} \quad (6)$$

where $RONA$ denotes the ratio of operating income to the book value of net assets. Dev is the cash deviation from its optimal level, using the residuals predicted by Equation (1). NA is the natural log of the book value of net assets. PPE is the ratio of property, plant, and equipment to the book value of net assets. φ and τ are industry and year fixed effects, respectively. ϵ is the error term. I lagged the long-term institutional ownership and include lagged operating performance.

I estimate Equation (6) using only a subsample of firms with excess cash, as the aim here is to study the use of excess cash. My main interest is in the moderating effect of long-term institutional ownership on the effect of the use of excess cash on operating performance. The coefficient β_1 of the interaction between $LTIO_{it-1}$ and $\frac{Dev_{it-1}}{NA_{it-1}}$ captures such an effect. I further re-estimate Equation (6) using industry adjusted operating performance ($RONA$ [$Industry\ adjusted$]) and controlling for firm and year fixed effects.

4. Data and Variables

4.1 Sample and data sources

My sample consists of the UK firms that traded in the London Stock Exchange during the period of 2000–2016. The data are from three sources: Ownership data is obtained from Thomson Reuters Eikon *Ownership & Profiles* module. Eikon provides detailed information of the firm's shareholders, such as name, number of shares held, investment style, and the first date of holding the shares. I further use the Thomson Reuters Datastream database to obtain financial and accounting data for firms with full ownership information available. Finally, I collect corporate governance data from BoardEx and Thomson Reuters Asset4 module.

Following the literature, firms operating in financial industries (Standard Industrial Classification [SIC] codes 6000–6999) and utility industries (SIC codes 4900–4999) have been

excluded from the sample, as such industries are entitled to meet some capital requirements and regulatory supervision (Opler et al., 1999; Ozkan and Ozkan, 2004; Bates, Kahle and Stulz, 2009; Farinha, Mateus and Soares, 2018). The final dataset consists of 11,830 firm-year observations. To avoid the problem of large outliers, all continuous variables have been truncated at the 1st and 99th percentiles.

4.2 Variables

Cash deviation

The primary dependent variable to test hypothesis *H1* is the cash deviation from the estimated optimal level of cash holdings ($/Dev/$). In other words, the cash deviation of firm i in year t is the residual from the regression model that predicts the optimal cash level for firm i in year t, in Equation (1). The optimal cash level ($C*$) can be defined as the cash that is needed to fund firms' fundamental investments and operations (Oler and Picconi, 2014; Lozano and Durán, 2017). $C*$ is a function of firm-level characteristics that influences firm cash holdings. Following the literature (e.g., Ozkan and Ozkan, 2004; Bates, Kahle and Stulz, 2009; Farinha, Mateus and Soares, 2018), I use the cash and cash equivalents to total assets ratio as a primary measure of corporate cash holdings.

Excess return

I employ the stock excess return model of Faulkender and Wang (2006) to study the relationship between long-term institutional ownership and the value of cash holdings, for hypothesis *H2*. The dependent variable in this model is the difference between a firm's stock return and a benchmarking return, namely, excess return. For benchmarking, I use the Fama and French (1993) 25-size and book-to-market value-weighted portfolios (Faulkender and Wang, 2006; Dittmar and Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013; Bates, Chang and Chi, 2018). Thus, my dependent variable in Equation (5) ($r_{it} - R_{it}^{B}$) is the firm's stock return over one year from $t-1$ to t minus the benchmarking return of size and book-to-market matched portfolio over one year from $t-1$ to t.

Operating performance

To test my prediction in hypothesis *H3* on the moderating effect of long-term institutional ownership on the relationship between excess cash and operating performance, I use the ratio of operating income to the book value of net assets ($RONA$) to proxy for a firm's operating performance. I further use an industry adjusted ratio normalized by industry-year average ($RONA\ [Industry\ adjusted]$), following Dittmar and Mahrt-Smith (2007) and Schauten, van Dijk and van der Waal (2013).

Investment horizon

Recent papers (e.g., Elyasiani and Jia, 2010; Attig et al., 2012; Wang, 2014; Yin, Ward and Tsolacos, 2018) on investment horizon literature use the duration of those investors which remain investing in a firm as a proxy for investment horizon. Wang (2014) argues that, while portfolio turnover[8] measures an investor's investment horizon at the fund level, investment duration can capture the investor's horizon at a specific firm level. Indeed, an investor might be a long-term investor at the fund level, but choose to not be so in some firms in their portfolio. Using investment duration at firm level overcomes such a flaw and ensures that only investors who intentionally choose to hold a firm's shares for a long period are classified as long investors (Yin, Ward and Tsolacos, 2018). I also believe that using the investment duration of investors at a firm level is more relevant when studying a firm's cash policy. In order for an investor to monitor a firm's cash policy and actively engage with the firm's management, the investor should be investing in the firm for a long enough time, or at least planning to stay in the firm for a while, including the cost of the monitoring and intervention. Thus, in this study, following Wang (2014) and McCahery, Sautner and Starks (2016), I classify institutional investors based on their investment duration in a specific firm as long-term institutional investors if such investors hold their shares for at least eight quarters (two years).[9]

[8] Several proxies of the institutional investors' investment horizon have been used in previous literature. One strand of the literature adopts Bushee's (1998) measure to classify investors based on investment horizon (e.g. Wahal and McConnell, 2000; Bushee, 2001; Dikolli, Kulp and Sedatole, 2009). Bushee (1998) uses past trading behaviour to distinguish between short-term ('transient') and long-term ('dedicated') investors, where he classifies investors with a low-turnover and concentrated portfolio as long-term investors. While Bushee (1998) uses the absolute value of the change in investor positions over one quarter, other researchers use the Churn ratio to measure an investor's turnover portfolio. For instance, Gaspar, Massa and Matos (2005) calculate the Churn ratio by summing the aggregates of the purchase and sale of an investor's overall portfolio. On the other hand, Yan and Zhang (2009) argue that using the minimum between the aggregate purchase or sale is superior, as it reduces the effect of an investor's cash flow on portfolio turnover.

[9] Using different durations such as twelve quarters for long-term institutional investors does not change my results.

Firm-level controls

The firm-specific control variables used in this study are motivated by most studies in cash holdings literature (e.g., Opler et al., 1999; Ozkan and Ozkan, 2004; Dittmar and Mahrt-Smith, 2007; Harford, Mansi and Maxwell, 2008; Bates, Kahle and Stulz, 2009; Oler and Picconi, 2014; Farinha, Mateus and Soares, 2018). These variables include firm *Size*, *Leverage*, *Market-to-book*, *Cash Flow*, *Industry Sigma*, *NWC*, *R&D*, *Capital Expenditure*, *Acquisition*, and *Dividend*.

Firm *Size* is defined as the natural log of the book value of total assets. Accessibility to capital market can be captured by firm size (Oler and Picconi, 2014); thus, small firms are expected to hold more cash as they may have limited access to external funds at a higher cost compared with larger firms. Moreover, large firms can benefit from the economies of scale in holding cash (Bates, Kahle and Stulz, 2009), and they hold a lower cash ratio to their total assets compared with small firms. Harford, Mansi and Maxwell (2008) also suggest that firm size is a proxy for takeover deterrent. This means small firms are more likely to hold high cash amounts to resist takeover attacks. Overall, I expect that cash holdings decrease with the increase of firm size.

Leverage is the ratio of total debt (short and long debt) to the book value of total assets. According to the hedge theory of Acharya, Almeida and Campello (2007), there is a positive relationship between a firm's cash holding and leverage (Bates, Kahle and Stulz, 2009). However, most of the literature shows a negative coefficient of leverage on cash holding [see, for example, the literature review of Weidemann (2018)]. Indeed, the negative relationship is supported by the idea that firms spend cash in serving their outstanding debt, and the interest payment will naturally increase with leverage (Jensen, 1986). Thus, I expect to find similar results to the literature on the relationship between leverage and cash holdings.

Market-to-book is the ratio of the market value to the book value of total assets. The market-to-book ratio is used in cash holdings literature to proxy for a firm's investment opportunities. According to the precautionary motive of holding cash, firms with higher investment opportunities may hoard more cash to enhance their ability to undertake future investment opportunities. Thus, I expect a positive relationship between market-to-book ratio and cash holdings.

Cash Flow is measured as earnings after interest, taxes and dividends, but before depreciation to the book value of total assets. On the one hand, firms with a high cash inflow can accumulate more cash. Moreover, high cash inflows can mean that firms encounter better investment opportunities (Bates, Kahle and Stulz, 2009) which encourage firms to hoard more cash as aforementioned. On the other hand, and consistent with the precautionary motive, firms with high cash inflows are less likely to need to hoard high cash holdings. Opler et al. (1999) suggest that the relationship between cash flow and cash holdings depends on the measures of cash being used and the period of the study. Thus, I expect to find a negative coefficient, which is consistent with the findings of Farinha, Mateus and Soares (2018), whose study context and measures of cash are similar to mine.

Industry Sigma is the average standard deviation of cash flows of all firms in the same industry and year over the past 10 years. Because of precautionary reasons, I expect that firms operating in industries with high volatile cash flow will hold more cash.

NWC is measured as the net working capital minus cash to the book value of total assets. As NWC and cash holdings represent the liquidities of firms, they are in some cases considered to be substitutes for each other (Bates, Kahle and Stulz, 2009). Accordingly, I expect that a firm decreases its cash holding as NWC increases.

R&D is the ratio of research and development expenses to a firm's total sales. Because of frequent missing data in research and development expenses, I follow most literature and substitute missing data of research and development expenses with zero when missing. As R&D expenses consume cash reserves, one may expect that R&D and cash holding will have a negative relationship. However, as firms which operate in an environment with high R&D spending are enjoying better investment opportunities, but exposing themselves to greater financial constrains (Opler et al., 1999; Bates, Kahle and Stulz, 2009), I expect that firms in such an environment will hoard more cash.

Capital Expenditure is the ratio of capital expenditure to the book value of total assets. In theory, capital expenditure can have a positive or negative relationship with cash holding. Similar to R&D, firms with high capital expenditure are more likely to have greater growth opportunities and higher financial constraints. Based on this argument, one may expect a positive relationship between capital expenditure and cash holdings. On the other hand, if capital expenditure is expended to increases a firm's assets that can be used as collateral, the

firm will have greater borrowing capacity, and then less need for high cash holdings. Also, capital expenditure consumes cash reserves. Thus, I expect a statistically significant relationship between capital expenditure and cash holdings with a sign dependent on the context.

Acquisition is measured as the ratio of net cash flows towards acquisitions to the book value of total assets. The aforementioned arguments of the relationship between capital expenditure and cash will hold true with acquisitions. Thus, I expect to find a statistically significant coefficient with a similar sign to capital expenditure.

Dividend is a dummy variable that equals 1 if the firm paid dividends in a particular year, and zero otherwise. I expect firms that pay a dividend will have lower cash holdings. Firms consume their cash reserves as they pay dividends. At the same time, Bates, Kahle and Stulz (2009) argue that paying-dividend firms are less likely to be risky and have better access to the capital market, and, therefore, have less need to hold high cash reserves.

4.3 Descriptive statistics

Table 1 presents summary statistics for all independent and dependent variables used in my study. All variables are defined in Appendix B Table B1. Panel A of *Table 1* presents my main explanatory variables. The average ownership of institutional investors is 31.3% in UK firms. Long-term institutional ownership represents approximately two-thirds of institutional ownership, which is around 23.3% of total ownership. Once I divide the long-term institutional investors into index versus non-index investors, I see most of the long-term institutional investors in my sample are non-index investors who, on average, hold 20% of a firm's shares compared with 3.4% held by index investors. It is also interesting to distinguish between long-term investors based on their overall portfolio turnover. I find that, in my sample, most of the long-term institutional investors—around 75%—have a low-turnover portfolio. Moreover, on average, 21.2% of UK firms are controlled by large investors with at least 5% positions.

Table 1. Summary statistics

This table provides summary statistics. Panel A shows the descriptive statistics for ownership variables. Panel B shows the descriptive statistics for cash and cash deviation dependent variables. Panel C shows the descriptive statistics for the main firm-level control variables. Panel D shows the descriptive statistics for dependent and control variables based on the excess return model of Faulkender and Wang (2006). Panel E shows the descriptive statistics for dependent and control variables used for operating performance analysis. Panel F shows the descriptive statistics for dependent and control variables used for the market-to-book model of Fama and French (1998). All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1.

	N	Mean	Median	SD	25th	75th
Panel A: ownership variables						
Long-term IO	11254	0.233	0.174	0.212	0.050	0.385
Long-term IO (non-indexer)	11218	0.204	0.156	0.186	0.035	0.339
Long-term IO (indexer)	7431	0.034	0.025	0.038	0.000	0.056
Long-term IO (low portfolio turnover)	11137	0.161	0.116	0.161	0.020	0.257
Long-term IO (high portfolio turnover)	8851	0.016	0.001	0.031	0.000	0.016
Institutional Ownership	11254	0.313	0.270	0.227	0.120	0.482
Blockholding (5%)	11254	0.212	0.190	0.153	0.096	0.312
Panel B: cash dependent variables						
Cash	11254	0.135	0.079	0.154	0.030	0.180
|Dev|	11254	0.091	0.067	0.091	0.032	0.117
Excess cash	4667	0.111	0.068	0.121	0.029	0.150
Cash deficit	6587	-0.077	-0.067	0.058	-0.106	-0.034
Panel C: firm-level variables						
Size	11254	11.950	11.735	2.223	10.299	13.462
Leverage	11254	0.169	0.136	0.167	0.013	0.268
Market-to-book	11254	1.791	1.393	1.309	1.023	2.057
Cash Flow	11254	0.008	0.055	0.195	-0.003	0.095
Industry Sigma	11254	0.464	0.322	0.445	0.124	0.604
NWC	11254	0.019	0.010	0.196	-0.090	0.128
R&D	11254	0.029	0.000	0.095	0.000	0.010
Capital Expenditure	11254	0.044	0.027	0.052	0.011	0.057
Acquisition	11254	0.025	0.000	0.056	0.000	0.020
Dividend	11254	0.601	1.000	0.490	0.000	1.000
Panel D: Excess return model						
Excess return	7719	0.011	-0.075	0.801	-0.317	0.186
ΔCash/ME	7719	0.010	0.001	0.173	-0.037	0.048
ΔEarnings/ME	7719	0.013	0.008	0.319	-0.036	0.052
ΔNet Assets/ME	7719	0.085	0.048	0.526	-0.047	0.203
ΔR&D/ME	7719	0.001	0.000	0.012	0.000	0.000
ΔInterest/ME	7719	0.000	0.000	0.017	-0.002	0.003
ΔDividends/ME	7719	0.000	0.000	0.017	0.000	0.004
Cash/ME	7719	0.196	0.106	0.279	0.040	0.240
Debt/MV	7719	0.183	0.118	0.204	0.003	0.296
New Finance/ME	7719	0.071	0.002	0.253	-0.009	0.087
Panel E: operating performance analysis						
RONA	4330	-0.110	0.072	0.711	-0.044	0.136

RONA (Industry adjusted)	4330	-0.145	0.012	0.704	-0.069	0.095
Net Assets	4330	11.610	11.464	2.529	9.719	13.539
PP&E	4330	0.278	0.203	0.251	0.069	0.427
Panel F: Market-to-book model						
Market Value/NA	5497	2.408	1.534	3.283	1.085	2.394
ΔCash/NA	5497	0.017	0.002	0.318	-0.029	0.045
XCash/NA	4319	0.027	-0.022	0.337	-0.088	0.060
ΔF2 Market Value/NA	5497	0.598	0.141	4.352	-0.390	0.810
ΔL2 Net Assets/NA	5497	0.096	0.161	0.621	-0.067	0.385
ΔF2 Net Assets/NA	5497	0.351	0.115	1.227	-0.102	0.428
Earnings/NA	5497	-0.024	0.066	0.384	-0.028	0.121
ΔL2 Earnings/NA	5497	0.008	0.016	0.382	-0.054	0.069
ΔF2 Earnings/NA	5497	0.034	0.020	0.405	-0.049	0.095
R&D/NA	5497	0.035	0.000	0.127	0.000	0.008
ΔL2 R&D/NA	5497	0.007	0.000	0.057	0.000	0.000
ΔF2 R&D/NA	5497	0.006	0.000	0.068	0.000	0.000
Dividends/NA	5497	0.022	0.014	0.031	0.000	0.031
ΔL2 Dividends/NA	5497	0.002	0.000	0.022	0.000	0.007
ΔF2 Dividends/NA	5497	0.005	0.000	0.027	0.000	0.009
Interest/NA	5497	0.015	0.011	0.017	0.003	0.021
ΔL2 Interest/NA	5497	0.000	0.000	0.017	-0.003	0.006
ΔF2 Interest/NA	5497	0.003	0.000	0.022	-0.004	0.005
Panel G: Corporate Governance						
CEO Duality	7318	0.199	0.000	0.400	0.000	0.000
CEO Tenure	7318	4.678	3.400	4.283	1.400	6.700
Independent NED in Board (%)	7318	0.400	0.429	0.219	0.273	0.571
Board Size	7318	6.927	7.000	2.256	5.000	8.000
Board Size2	7318	53.073	49.000	36.108	25.000	64.000

Panel B of *Table 1* shows the results of my main cash dependent variables. While UK firms hold, on average, 13.5% of their total assets in the form of cash and cash equivalents, UK firms deviate from their optimal cash levels by 9.1%. Accordingly, the optimal cash level of an average UK firm will be around 4.4% if such a firm holds excess cash and 22.6% if the firm holds insufficient cash.[10] Firms with cash deficits represent around 59% of the sample and hold, on average, 8% less cash than their optimal cash levels. On the other hand, firms with excess

[10] If the average firm holds 14.1% of its assets in cash (C_{it}= 13.5%) and this average firm, on average, deviates by 9.1% above or below its optimal level ($|Dev_{it}|$= 9.1%), then the average firm might have an optimal level of cash that equals to 4.4% (C_{it}*= 13.5% - 9.1%) or 22.6% (C_{it}*= 13.5% + 9.1%).

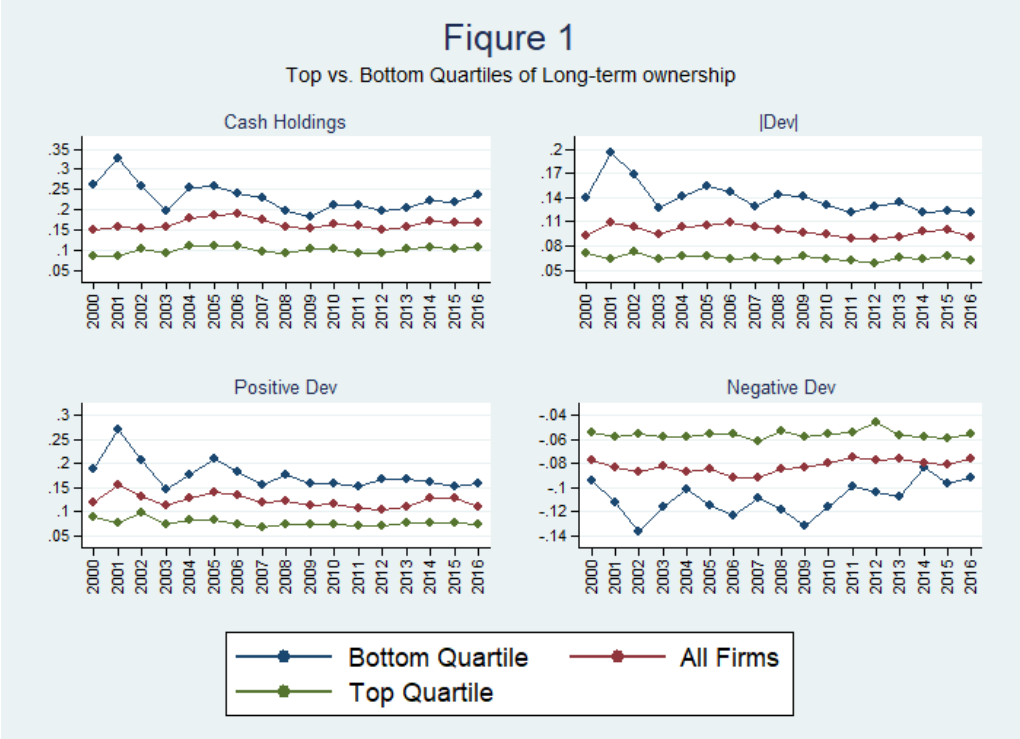
cash reserves hold, on average, 11.1% of their total assets in excess cash from their optimal cash levels.

Panel C of *Table 1* shows the summary results of the firm-level control variables. These variables are the main determinants of cash holdings used to estimate the optimal cash level in Equation (1), and then used as control variables in further analyses. Overall, the statistics in Panel C are similar to those in the previous literature. It is worth noting that the average cash flow in my study is smaller than the cash flow presented in cash literature using a similar context (Ozkan and Ozkan, 2004; Farinha, Mateus and Soares, 2018). While those earlier studies use earnings after interest and taxes, but before depreciation, I use earnings after interest, taxes, *and* common dividends, but before depreciation, following Opler et al. (1999) and Bates, Kahle and Stulz (2009). I argue that my measure of cash flow is more appropriate for my study, as I aim to predicate the optimal cash level and my dividend variable is a binary dummy rather than the actual amount paid as dividends.

Panels D, E, and F of *Table 1* present summary statistics for variables used in the value of cash analysis and operating performance analysis. Panel D shows that the average (median) stock excess return in my sample is 1.1% (-7.8%). Panel E show that the average return on net assets is -11% though the median is 7.2%. Moreover, PP&E interestingly represents only 27.8% of net assets.[11] In Panel F, I present summary statistics for variables used in the market-to-book model presented in the additional robustness section. Finally, Panel G reports summary statistics for corporate governance characteristics used in the robustness analyses section.

In untabulated analysis, I check for the potential multi-collinearity in all my estimation models. I follow prior ownership and cash holdings literature (e.g., Bushee, 1998; Callen and Fang, 2013; Kim et. al, 2016; Miranda-Lopez et. al, 2019; Neubaum and Zahra; 2006; Tihanyi et. al, 2003) and adopt Variance Inflation Factor (VIF) analysis to test for multi-collinearity. I find that all VIFs of the independent variables through all my estimated regression models are below the conventional rule-of-thumb value of 10 (Neter et al, 1983).

[11] As shown in Panel B, cash represents 13.5% of total assets, and, in the untabulated statistics, cash represents 35.5% of net assets.



I argue in this paper that the long-term institutional ownership affects corporate cash holdings. I divide my sample firms into five quintiles based on the long-term institutional ownership, where the bottom (top) quintile contains firms with the least (most) long-term institutional ownership. Panel A of *Table 2* presents descriptive statistics for cash variables for both quintiles. Panel A reveals that, on average, firms in the top quintile clearly hold a lower amount of cash and have smaller cash deviations compared with firms in the bottom quintile. Using a t-test to compare the equality of means, Panel B of *Table 2* confirms that the differences in means of cash variables between the top and bottom quintiles is statistically significant. Moreover, as can be seen in *Figure 1*, firms in the top quintiles not only have a lower cash amount and cash deviation, but they also have consistent cash ratios across years. Finally, *Figure 2* visualizes the cash deviation around the optimal cash level. While firms in both quintiles are more likely to have positive cash deviation, with excess cash—than having negative deviation, with cash deficit—firms in the top quintile have less dispersed cash deviations around their optimal cash level.

Table 2: Difference in cash by quartiles of long-term institutional ownership

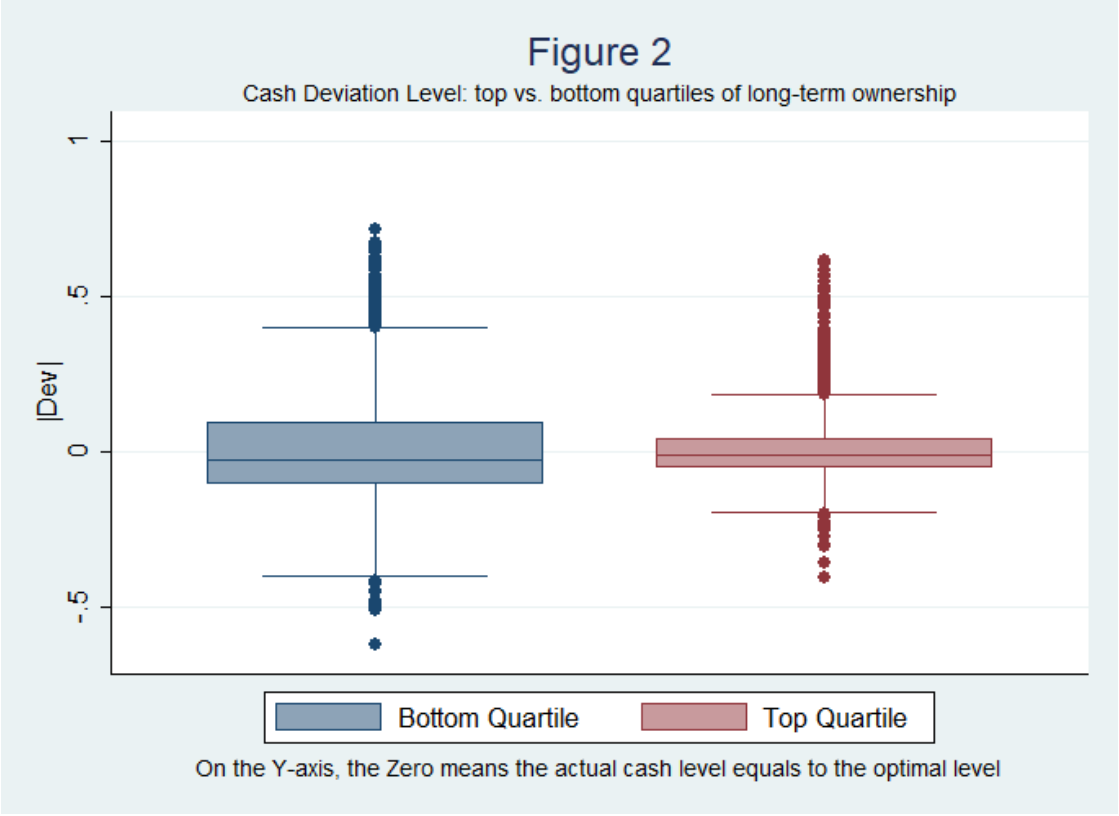
This tables shows a comparison of cash level and cash deviations between the top and bottom quartiles of long-term ownership. Panel A presents the means and medians for these quintiles. Panel B presents a T-test statistics of comparing the means. Detailed definitions of variables are in Appendix A.

Panel A: Descriptive statistics

	Bottom Quartile			Top Quartile		
	Obs.	**Mean**	**Median**	**Obs.**	**Mean**	**Median**
Cash	3451	0.228	0.138	4218	0.100	0.063
|Dev|	2138	0.138	0.103	3931	0.065	0.049
Dev	2138	0.015	-0.025	3931	0.001	-0.012
Large Positive Dev	845	0.193	0.142	1285	0.097	0.067
Large Negative Dev	852	-0.141	-0.124	854	-0.099	-0.090

Panel B: T-test comparing means

	Diff.	
Cash	0.130***	(34.16)
|Dev|	0.0733***	(30.01)
Dev	0.0151***	(4.22)



5. Estimation Results

5.1. Main analyses

I start by exploring the relationship between long-term institutional ownership and a firm's cash level and how this relationship differs when a firm has either an excess or insufficient cash level. Then, to test my first main hypothesis, I analyse the effect of long-term institutional ownership on the cash deviation from the optimal level and the change in cash when a firm does deviate from its optimal cash level. Second, I study the effect of long-term institutional ownership on the value of cash holdings. Third, I show the results of the moderating role of long-term institutional ownership on the use of excess cash and a firm's operating performance. Lastly, I provide several robustness tests.

5.1.1 Institutional investors' investment horizon and cash deviation

Table 3 presents the regression results of the effect of long-term institutional ownership on cash holdings. Column (1) suggests that long-term institutional ownership decreases a firm's cash holdings. In Columns (2)–(5), I differentiate between firms with excess cash and firms with cash deficit. The coefficients of long-term institutional ownership are negative and only statistically significant for a subsample of firms with excess cash. The regression estimation results are consistent with the agency view as long-term institutional investors tend to decrease the amount of cash held by a firm to minimize the potential agency costs. By contrast, and consistent with the precautionary view, the presence of large investors is associated with higher cash holdings, but only in firms with cash deficit. Overall, *Table 3* suggests that long-term institutional ownership decreases cash holdings especially when firms hold excess cash. The overall results of the control variables are consistent with the literature. In terms of economic significance, results from *Table 3* suggest that a 1-standard-devaition increase in long-term institutional ownership (21.1%) is associated with a decrease in cash holdings by 2.52%, 1.63% and 1.31% on average, for firms with excess cash, and for firms with large excess cash, respectively.

Table 3. Long-term institutional ownership and cash holdings

Table 3 reports the results of the effect of long-term institutional ownership on corporate cash holdings (Cash). Column (1) shows the results of the full sample. Columns (2) and (3) show the results of subsamples of firms with excess cash and firms with cash deficit, respectively. Columns (4) and (5) present the effect of long-term institutional ownership on cash holdings of subsamples of firms in the top and the bottom tertiles of cash deviations (*Dev*), respectively. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Industry and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

	Dependent Variable = Cash				
	(1)	(2)	(3)	(4)	(5)
	All firms	*Excess cash*	*Cash deficit*	*Large excess cash*	*Large cash deficit*
Long-term IO	-0.119***	-0.077***	-0.006	-0.062**	-0.010
	(0.017)	(0.021)	(0.009)	(0.022)	(0.008)
Institutional Ownership	0.090***	0.060**	0.015*	0.047*	0.011
	(0.016)	(0.021)	(0.008)	(0.024)	(0.008)
Blockholding (5%)	0.011	-0.010	0.011*	-0.009	0.009
	(0.016)	(0.018)	(0.005)	(0.019)	(0.006)
Size	-0.009***	-0.020***	-0.003***	-0.020***	-0.003***
	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Leverage	-0.259***	-0.353***	-0.165***	-0.349***	-0.159***
	(0.017)	(0.016)	(0.007)	(0.017)	(0.008)
Market-to-Book	0.025***	0.028***	0.014***	0.026***	0.014***
	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Cash Flow	-0.022	-0.058***	0.011*	-0.053***	0.005
	(0.016)	(0.015)	(0.005)	(0.016)	(0.005)
Industry Sigma	0.007	0.014*	0.008***	0.017**	0.007**
	(0.007)	(0.008)	(0.002)	(0.008)	(0.003)
NWC	-0.119***	-0.176***	-0.067***	-0.183***	-0.067***
	(0.014)	(0.014)	(0.006)	(0.015)	(0.006)
R&D	0.189***	0.250***	0.107***	0.246***	0.099***
	(0.038)	(0.027)	(0.015)	(0.027)	(0.013)
Capital Expenditure	-0.183***	-0.318***	-0.054***	-0.315***	-0.069***
	(0.036)	(0.039)	(0.017)	(0.041)	(0.023)
Acquisition	-0.203***	-0.355***	-0.060***	-0.372***	-0.098***
	(0.023)	(0.027)	(0.012)	(0.026)	(0.016)
Dividend	-0.018***	-0.042***	-0.011***	-0.041***	-0.010***
	(0.005)	(0.006)	(0.002)	(0.007)	(0.002)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.31	0.68	0.43	0.68	0.50
N	11254	4666	6587	3786	3654

In *Table 4*, I use different measures of cash to better understand the effect of long-term ownership on cash holdings. Column (1) simply regresses the long-term ownership and other controls on the real value of cash deviation. As can be seen, the coefficient of the long-term ownership is similar to the coefficient in Column (1) of *Table 3*. The reason for this similarity is that the cash deviation (Dev) is equal to the residual value of the regression that regresses the main determinants of cash on cash level, in Equation (1); here, I also control for the same variables. However, in Column (2), I use the absolute value of the cash deviation instead of the real value. The estimation results support my first hypothesis *H1*, which suggests that long-term institutional ownership decreases a firm's cash deviation from its optimal cash level. In terms of economic significance, column (2) of *Table 4* suggests that a 1-standard-devaition increase in long-term institutional ownership (21.1%) is associated with approximately one percent decrease in the absolute value of the cash deviation.

To test the sensitivity of the effect of long-term institutional ownership on cash deviation across the optimal cash level, following Almeida, Campello and Weisbach (2004), Riddick and Whited (2009), and Palazzon (2012), I use the change in cash as a dependent variable with subsampling when firms either have an excess or cash deficit. Columns (3)–(7) suggest that the presence of long-term institutional investors is associated with an increase in cash holdings only for firms who hold less cash than the optimal level and a decrease in cash for firms with large excess cash holdings. The estimated coefficients of long-term institutional ownership are negative for firms with excess cash, but only significant for firms with a large excess cash level; and they are positive and significant for firms with a cash deficit, albeit larger for firms with a large cash deficit. In terms of economic significance, columns (5) and (7) of *Table 4* suggest that a 1-standard-devaition increase in long-term institutional ownership (21.1%) is associated with an increase in the change of cash holdings by 1.08% and 1.34% for firms with cash deficit and firm with large cash deficit, respectively, and it is associated with a 0.85% decrease in the change of cash holdings for firms with large excess cash. Overall, the results in *Tables 3* and *4* show statistically significant support to hypothesis *H1* and both sub-hypotheses *Ha* and *Hb*.

Table 4. Long-term institutional ownership and cash deviations

Table 4 reports the results of the effect of long-term institutional ownership on cash deviations. Column (1) shows the effect of long-term institutional ownership on cash deviation (*Dev*). In Column (2), the absolute value of the cash deviation is the dependent variable (|*Dev*|). In Columns (3) – (7), the change in cash over one year from time *t*-1 to *t* is the dependent variable. Column (3) shows the results of the full sample. Columns (4) – (7) show the results of subsamples of firms with excess cash and firms with cash deficit, respectively. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Industry and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable =	*Dev*	*|Dev|*	*ΔCash*	*ΔCash*	*ΔCash*	*ΔCash*	*ΔCash*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All firms	*All firms*	*All firms*	*Excess cash*	*Cash deficit*	*Large excess cash*	*Large cash deficit*
Long-term IO	-0.119***	-0.045***	-0.008	-0.026	0.051***	-0.040*	0.063***
	(0.017)	(0.010)	(0.010)	(0.016)	(0.013)	(0.020)	(0.021)
Institutional Ownership	0.090***	0.029**	0.009	0.030	-0.040**	0.034	-0.061**
	(0.016)	(0.010)	(0.009)	(0.019)	(0.014)	(0.024)	(0.022)
Blockholding (5%)	0.011	-0.008	-0.019**	-0.053***	0.004	-0.059**	0.021*
	(0.016)	(0.009)	(0.008)	(0.018)	(0.008)	(0.021)	(0.010)
Size	0.000	-0.007***	0.000	-0.003	0.002*	-0.001	0.004**
	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)
Leverage	0.013	-0.085***	-0.010*	-0.050***	0.029***	-0.056***	0.033*
	(0.017)	(0.011)	(0.006)	(0.009)	(0.009)	(0.011)	(0.017)
Market-to-Book	-0.000	0.009***	0.002	0.004	-0.002**	0.004	-0.001
	(0.002)	(0.001)	(0.002)	(0.004)	(0.001)	(0.004)	(0.001)
Cash Flow	-0.011	-0.035***	0.037***	0.007	0.060***	0.002	0.053***
	(0.016)	(0.008)	(0.012)	(0.021)	(0.012)	(0.023)	(0.013)
Industry Sigma	-0.002	0.003	0.007	0.010	0.003	0.013	0.007
	(0.007)	(0.004)	(0.004)	(0.009)	(0.004)	(0.011)	(0.006)
NWC	-0.014	-0.046***	-0.064***	-0.074***	-0.056***	-0.080***	-0.073***
	(0.014)	(0.007)	(0.007)	(0.009)	(0.009)	(0.012)	(0.014)
R&D	-0.006	0.079***	-0.003	0.040	-0.031	0.014	-0.022

	(0.038)	(0.016)	(0.026)	(0.047)	(0.025)	(0.049)	(0.019)
Capital Expenditure	-0.034	-0.116***	-0.277***	-0.344***	-0.229***	-0.361***	-0.241***
	(0.036)	(0.023)	(0.034)	(0.038)	(0.043)	(0.046)	(0.043)
Acquisition	-0.011	-0.138***	-0.377***	-0.413***	-0.331***	-0.453***	-0.348***
	(0.023)	(0.015)	(0.032)	(0.046)	(0.035)	(0.053)	(0.044)
Dividend	0.003	-0.014***	0.003	-0.018***	0.015***	-0.022***	0.015***
	(0.005)	(0.003)	(0.003)	(0.005)	(0.003)	(0.006)	(0.004)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.01	0.24	0.06	0.10	0.12	0.11	0.13
N	11254	11254	10635	4381	6253	3553	3468

5.1.2 Institutional investors' investment horizon and the value of cash holdings

I further investigate the effect of long-term institutional investors on the value of cash holdings. In particular, I employ the excess return model, which allows an estimation of the moderating effect of long-term institutional investors on the relationship between changes in cash holdings and firm value. *Table 5* presents the estimation results of Equation (5).

In Columns (1)–(6), I regress the interaction term of long-term institutional ownership and the change in cash holdings on stock excess return. I use two measures for long-term institutional ownership: the ratio of total outstanding shares held by institutional long-term investors and a binary dummy variable differentiating between firms in the top and the bottom quartiles of long-term institutional ownership. Columns (1) and (2) present results on the full sample, and the estimated coefficients of the interaction terms show that long-term institutional ownership is positively moderating the effect of changes in cash on excess return. Columns (3)–(6) differentiate between firms with excess cash and firms with a cash deficit. The estimation results suggest that the positive moderating effect of long-term institutional investors holds true for firms with excess cash and firms with a cash deficit. These results support hypothesis *H2*.

I further re-estimate Equation (5) by differentiating between firms with high and low long-term institutional ownership. Columns (7) and (8) show the estimation results for these subsamples. The coefficient estimate of the change in cash is much larger for firms with a high proportion of long-term institutional ownership (1.436) compared with firms with low long-term institutional ownership (0.498). This is consistent with previously reported results and suggests that the marginal value of an additional dollar of cash is larger in the presence of long-term institutional investors. Overall, the results in *Table 5* support my prediction in hypothesis *H2*.

Table 5. Long-term institutional ownership and the value of cash holdings

Table 5 reports the results of the effect of long-term institutional ownership on the value of cash holdings using the excess return model of Faulkender and Wang (2006). Columns (1) and (2) show the results of the full sample. Columns (3) and (4) show the results of a subsample of firms with excess cash. Columns (5) and (6) show the results for a subsample of firms with cash deficits. Two measures are used for long-term institutional ownership: Long-term IO is defined as the ratio of total outstanding shares held by all long-term institutional investors, and Long-term IO (dummy) is an indicator variable equalling 1 for firms in the top quartile of long-term institutional ownership, and zero for firms in the bottom quartile. In Columns (1) – (6), the variables of interest are the interactions between long-term IO and ΔCash/ME which indicate the moderating role of long-term institutional ownership on the effect of the change in cash holdings on excess return. Columns (7) and (8) show the results of the baseline specification of the excess return model on subsamples of firms in the top quartile of long-term institutional ownership and firms in the bottom quartile, respectively. Standard errors (in brackets) are robust to arbitrary heteroscedasticity. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

	Dependent Variable = Excess Return							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All firms	*All firms*	*Excess cash*	*Excess cash*	*Cash deficit*	*Cash deficit*	*High long-term IO*	*Low long-term IO*
Long-term IO	-0.037		-0.029		-0.045			
	[0.028]		[0.047]		[0.035]			
Long-term IO X ΔCash/ME	1.130***		1.218**		1.393**			
	[0.391]		[0.506]		[0.587]			
Long-term IO (dummy)		0.004		0.018		-0.035		
		[0.023]		[0.031]		[0.036]		
Long-term IO (dummy) X ΔCash/ME		0.564***		0.614**		0.116		
		[0.203]		[0.257]		[0.418]		
ΔCash/ME	0.386*	0.597***	0.261	0.485*	0.872***	1.550***	1.436***	0.498**
	[0.204]	[0.215]	[0.280]	[0.269]	[0.256]	[0.537]	[0.247]	[0.252]
ΔEarnings/ME	0.126**	0.079	0.174	0.137	0.098**	0.059	-0.058	0.128*
	[0.056]	[0.058]	[0.111]	[0.089]	[0.048]	[0.075]	[0.080]	[0.075]
ΔNet Assets/ME	0.203***	0.195***	0.207***	0.173**	0.181***	0.137**	0.209***	0.190**
	[0.035]	[0.056]	[0.059]	[0.082]	[0.042]	[0.064]	[0.050]	[0.079]
ΔR&D/ME	-1.046*	-2.168**	-1.436	-2.025	-0.687	-2.723**	-1.203	-3.463**
	[0.632]	[0.959]	[1.016]	[1.475]	[0.763]	[1.291]	[1.183]	[1.495]
ΔInterest/ME	-1.385**	-1.023	-1.612	-0.328	-0.455	-0.129	-2.351*	0.130
	[0.616]	[0.857]	[1.191]	[1.333]	[0.658]	[1.263]	[1.237]	[1.146]

ΔDividends/ME	0.353	0.268	0.667	-0.282	0.580	1.591*	-0.185	2.287*
	[0.450]	[0.574]	[0.576]	[0.814]	[0.672]	[0.850]	[0.639]	[1.260]
New Finance/ME	-0.042	-0.119	0.095	0.005	-0.208**	-0.280*	-0.252***	-0.043
	[0.070]	[0.109]	[0.105]	[0.150]	[0.083]	[0.164]	[0.098]	[0.148]
L.Cash/ME	0.425***	0.298***	0.439***	0.255***	0.807***	1.381**	0.168**	0.363***
	[0.062]	[0.072]	[0.075]	[0.066]	[0.203]	[0.588]	[0.084]	[0.104]
L.Cash/ME X ΔCash/ME	-0.548**	-0.297	-0.496*	-0.362	-0.537	1.036	-0.316	-0.327
	[0.236]	[0.182]	[0.280]	[0.223]	[0.483]	[0.807]	[0.239]	[0.242]
Debt/MV	-0.405***	-0.337***	-0.466***	-0.314***	-0.396***	-0.409***	-0.317***	-0.404***
	[0.040]	[0.050]	[0.067]	[0.064]	[0.054]	[0.090]	[0.045]	[0.108]
Debt/MV X ΔCash/ME	0.202	-0.709*	0.115	-0.642	0.325	-1.248*	-1.666***	-0.170
	[0.377]	[0.419]	[0.487]	[0.524]	[0.533]	[0.734]	[0.489]	[0.562]
R^2	0.07	0.06	0.06	0.07	0.09	0.09	0.10	0.05
N	7657	3570	3732	1749	3925	1821	2259	1311

5.1.3 Institutional investors' investment horizon and the use of excess cash

I now focus on the moderating effect of long-term institutional ownership on the use of excess cash and a firm's operating performance. First, in *Table 6*, I investigate the effect of long-term institutional ownership on the accumulation and dissipation of excess cash, following Dittmar and Mahrt-Smith's (2007) regression model. Then, *Table 7* presents the results of Equation (6), which estimates the moderating effect of long-term institutional ownership on the use of excess cash and operating performance. Thus, the estimation results reported in *Tables 6* and *7* are limited to firms with excess cash.

Table 6. Long-term institutional ownership and accumulation and dissipation of excess cash

Table 6 reports the results of the effect of long-term institutional ownership on the accumulation and dissipation of excess cash. All Columns use a subsample of firms with excess cash. Columns (1) and (2) show the results of the effect of long-term institutional ownership on the accumulation of excess cash. Columns (3) and (4) show the results of the effect of long-term institutional ownership on the dissipation of excess cash. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable =	*ΔDev (t - t-1)*		*ΔDev (t+1 - t)*	
	(1)	(2)	(3)	(4)
	Excess cash			
L.Long-term IO	-0.029***			
	[0.007]			
L.Long-term IO (dummy)		-0.015**		
		[0.006]		
L.Industry average Δ Dev	1.172***	1.176***		
	[0.084]	[0.109]		
Long-term IO			0.059***	
			[0.006]	
Long-term IO (dummy)				0.050***
				[0.006]
Industry average Δ Dev			1.037***	1.071***
			[0.071]	[0.098]
R^2	0.08	0.10	0.08	0.12
N	4184	2099	4266	2157

In *Table 6*, Columns (1) and (2) show the estimation results for the effect of long-term institutional ownership on the accumulation of excess cash, and Columns (3) and (4) show the results for the effect on the dissipation of excess cash. *Table 6* shows that long-term institutional ownership significantly affects both the accumulation and the dissipation of excess cash, but in different directions. In particular, the coefficient estimates of long-term

institutional ownership are negative in Columns (1) and (2), but positive in Columns (3) and (4). These results suggest that firms with a high presence of long-term institutional investors and excess cash tend to decrease the accumulation of more cash, but also decrease the dissipation of their excess cash holdings. These results, along with the previously reported results in *Tables 3* and *4*, can be interpreted as meaning that firms with a high proportion of long-term institutional ownership are less likely to have excess cash; and if they do, it is a low amount of excess cash and will be dissipated less aggressively compared with other firms. Overall, my findings are consistent with prior studies that suggest poorly governed firms dissipate their excess cash more aggressively than well-governed firms.

Thus, in *Table 7*, I aim to investigate if the negative effect of excess cash on operating performance that is documented in prior literature is moderated by the presence of long-term institutional investors. I proxy for operating performance using operating return on net assets ($RONA$) and industry adjusted operating return on net assets ($RONA$ [$Industry\ adjusted$]). Columns (1), (2), (5), and (6) present the results for only firms with excess cash. The coefficient estimates for the interaction term are positive and statistically significant, except in the case of Column (5), which is positive, but not significant. In Columns (3), (4), (7), and (8), I use a subsample of firms with excess cash and high capital expenditure to better understand the efficiency in the use of excess cash in firms with high long-term institutional ownership. The estimation results are consistent with the prior results; however, the moderating effect is larger for firms with high spending in capital expenditure. These results support my prediction in hypothesis *H3*.

Table 7. The use of excess cash and operating performance

Table 7 reports the results of the moderating role of long-term institutional ownership on the effect of excess cash on corporate operating performance. In Columns (1) – (4), the dependent variable is RONA which is defined as the ratio of operating income to the book value of net assets. In Columns (5) – (8), the dependent variable is RONA (Industry adjusted) which is defined as RONA minus the industry-year median RONA. Columns (1), (2), (5) and (6) show the results of a subsample of firms with excess cash. Columns (3), (4), (7) and (8) show the results of a subsample of firms with excess cash and capital expenditure above industry median. Standard errors (in brackets) are robust to arbitrary heteroscedasticity. Industry and year fixed effects are included in Columns (1) – (4), and firm and year fixed effects are included in Columns (5) – (8). All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable =	*RONA*				*RONA (Industry adjusted)*			
	(1) *Excess cash*	(2) *Excess cash*	(3) *Excess cash & high capital expenditure*	(4) *Excess cash & high capital expenditure*	(5) *Excess cash*	(6) *Excess cash*	(7) *Excess cash & high capital expenditure*	(8) *Excess cash & high capital expenditure*
L.Long-term IO	-0.152***		-0.057**		-0.244***		-0.051	
	[0.035]		[0.028]		[0.055]		[0.052]	
L.Long-term IO X L.Dev	0.305**		0.335**		0.239		0.075	
	[0.129]		[0.152]		[0.154]		[0.187]	
L.Long-term IO (dummy)		-0.070***		-0.002		-0.134***		-0.032
		[0.026]		[0.024]		[0.051]		[0.033]
L.Long-term IO (dummy) X L.Dev		0.101**		0.150**		0.101*		0.143**
		[0.043]		[0.059]		[0.059]		[0.063]
L.Dev	-0.102***	-0.101***	-0.040	-0.062*	-0.079**	-0.075***	0.005	-0.122**
	[0.022]	[0.024]	[0.032]	[0.038]	[0.033]	[0.026]	[0.087]	[0.062]
L.RONA	0.593***	0.568***	0.706***	0.582***				
	[0.059]	[0.067]	[0.081]	[0.099]				
L.RONA (Industry adjusted)					0.293***	0.281***	0.355***	0.438**
					[0.064]	[0.072]	[0.098]	[0.207]
Net Assets	0.057***	0.061***	0.039***	0.047***	0.226***	0.188***	0.134**	0.034
	[0.008]	[0.010]	[0.007]	[0.012]	[0.037]	[0.067]	[0.053]	[0.025]

PP&E	-0.051	-0.100	-0.019	-0.094	-0.309***	-0.386	-0.128	-0.316
	[0.047]	[0.079]	[0.049]	[0.081]	[0.112]	[0.272]	[0.108]	[0.205]
Firm Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	No	No	No	No
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.55	0.6	0.57	0.61	0.68	0.78	0.69	0.81
N	4349	2166	2425	1258	4100	1864	2166	1027

5.2 Additional robustness[12]

To check the robustness of my results, I conduct several additional tests. First, I differentiate between different types of long-term institutional investors. Second, to control for the time-invariant unobserved heterogeneity at the firm level, I re-estimate my main models on the effect of long-term institutional ownership on cash holdings and cash deviation controlling for firm-year fixed effects instead of industry-year fixed effects. Third, I employ instrumental variable (IV) methods to revoke the potential concern of reverse causality. Fourth, I use an alternative widely used model of the value of cash holdings to check the robustness of my results to different estimation specifications. Fifth, I adopt an alternative method of testing the moderating effect of long-term institutional ownership on the use of excess cash and operating performance. Finally, I replicate my models controlling for main corporate governance characteristics. The following sections present these robustness tests, respectively.

5.2.1 The heterogeneity of long-term institutional investors

In *Table 8*, I re-estimate my baseline model on the effect of long-term institutional ownership on cash holdings and cash deviation differentiating between different types of long-term institutional investors. First, I differentiate between indexer long-term investors who invest in a firm as a part of their investment in a particular stock market index and non-indexer long-term investors who intentionally choose to hold their positions for the long term. Panel A presents the heterogeneous effect of indexer and non-indexer long-term institutional ownership on cash holdings. As expected, the estimated coefficients are only negative and statistically significant for non-indexer long-term institutional investors. Conversely, long-term ownership by indexer investors seems to increase cash holdings, although the coefficient estimates are not statistically significant.

Panel B of *Table 8* presents the results for long-term institutional investors with high portfolio turnover and long-term institutional investors with low portfolio turnover. The estimation results show that only long-term institutional investors with a low portfolio turnover have a consistent negative significant effect on cash holdings, while the effect of long-term ownership by institutional investors with a high portfolio turnover is positive, but not significant except for one model at 10% P-value. The results in *Table 8* are consistent with the

[12] The results for this section are presented in Appendix B.

idea that indexer and long-term institutional investors with high portfolio turnover are less interested and actively involved in firms' policies, as they are more likely to be widely diversified and passive investors (Bushee, 1998; Wang, 2014).

5.2.2 Firm fixed effects estimation

The omitted variables bias is a potential concern that might affect my results. I address this bias by using firm fixed effects to control for time-invariant unobserved heterogeneity. Panel A and Panel B of *Table 9a* replicate the estimation regressions in *Table 3* and *Table 4* respectively, but controlling for firm fixed effects instead of industry fixed effects. *Table 9b* replicates the first and last models in *Table 5*. The estimation results are consistent with the main previously reported results. Overall, my results on the negative effect of long-term institutional ownership on cash holdings and cash deviation and the positive moderating effect on the value of cash are robust for time-invariant unobserved heterogeneity within firm level.

5.2.3 IV estimation

I further address the self-selection bias. One may expect that long-term institutional investors may choose to invest in firms with low cash holdings and small cash deviation rather than influence firm cash policy. To deal with this potential concern, I follow Huang and Petkevich (2016) and conduct a two-stage estimation with instrumental variables for long-term institutional ownership. Note that Huang and Petkevich use two instruments for institutional ownership: the industry median of institutional ownership and the lagged ownership. I perform a similar procedure, and the results for both stages are presented in *Table 10*. Column (1) of *Table 10* presents the estimation results of the first stage, and Columns (2)–(6) present the second-stage results. Overall, the results are very similar in direction and magnitude to my main estimation results and support hypothesis *H1*, although the over-identification tests are not valid for a subsample of firms with excess cash and when using the absolute value cash deviation as the dependent variable.

5.2.4 The value regression estimation

To check the robustness of my results on the effect of long-term institutional ownership on the value of cash holdings, I adopt an alternative model to investigate my prediction in hypothesis *H2*. I use the value regression of Fama and French (1998) which was first used in the value of cash literature by Pinkowitz and Williamson (2002) and Pinkowitz, Stulz and Williamson (2006). Since then, this model has been widely used in the literature (e.g., Dittmar

and Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013; Bates, Chang and Chi, 2018). I estimate the following specification:

$$\frac{MV_{it}}{NA_{it}} = \beta_0 + \beta_1 LTIO_{it} \times \frac{XC_{it}}{NA_{it}} + \beta_2 LTIO_{it} + \beta_3 \frac{XC_{it}}{NA_{it}} + \beta_4 \frac{\Delta MV_{it+2}}{NA_{it}} + \beta_5 \frac{\Delta NA_{it}}{NA_{it}} + \beta_6 \frac{\Delta NA_{it+2}}{NA_{it}} + \beta_7 \frac{E_{it}}{NA_{it}} + \beta_8 \frac{\Delta E_{it}}{NA_{it}} + \beta_9 \frac{\Delta E_{it+2}}{NA_{it}} + \beta_{10} \frac{D_{it}}{NA_{it}} + \beta_{11} \frac{\Delta D_{it}}{NA_{it}} + \beta_{12} \frac{\Delta D_{it+2}}{NA_{it}} + \beta_{13} \frac{I_{it}}{NA_{it}} + \beta_{14} \frac{\Delta I_{it}}{NA_{it}} + \beta_{15} \frac{\Delta I_{it+2}}{NA_{it}} + \beta_{16} \frac{RD_{it}}{NA_{it}} + \beta_{17} \frac{\Delta RD_{it}}{NA_{it}} + \beta_{18} \frac{\Delta RD_{it+2}}{NA_{it}} + \alpha_i + \tau_t + \epsilon_{it}, \quad (7)$$

where MV is market value of equity plus total liabilities. NA is net assets (total assets – cash and cash equivalents). XC is the difference between cash and cash equivalents and the optimal cash level predicated by Equation (1). E is earnings before extraordinary items. D is common dividends. I equals interest expense. RD is research and development expenses. α_i and τ_t are firm and year fixed effects. ϵ_{it} is the error term. ΔX_{it} denotes a change of X over two years from $t-2$ to t.

Table 11a presents the estimation results of the effect of long-term institutional ownership on the value of cash holdings using a market-to-book model, in Equation (7). The results are consistent with the estimation results reported in *Table 5*. Indeed, unlike in Equation (5), where I use the change in cash holdings over one year, Equation (7) uses the difference between the actual cash level and the predicted optimal cash level, namely, cash deviation. Using cash deviation ensures that I only account for the change in cash that is not related to the determinants of optimal cash (Dittmar and Mahrt-Smith, 2007; Schauten, van Dijk and van der Waal, 2013). Though the interpretation of the interaction term will be slightly different, the overall results support hypothesis *H2*. In *Table 11b*, I re-estimate Equation (7) using the change in actual cash holdings, and I find consistent results, although these are only statistically significant when I proxy for long-term institutional ownership by binary dummy.

5.2.5 Use of excess cash using subsamples

Table 12 employs an alternative method to test the moderating effect of long-term institutional ownership on the negative effect of excess cash and operating performance. While I use the interaction between long-term institutional ownership and excess cash in *Table 8*, I here subsample firms based on the proportion of long-term institutional ownership. I differentiate between firms with high levels of long-term institutional ownership (in the top quartile) and firms with low long-term institutional ownership (in the bottom quartile). The coefficient estimates of excess cash is negative and only statistically significant for firms with low long-term institutional ownership. It is worth noting that the estimated coefficient is

negative and significant in only one of the columns (Column 5) that used the subsample of firms with high long-term institutional ownership, though it is smaller than the coefficient of the subsample of firms with low long-term institutional ownership. While the estimation results in *Table 12* do not provide direct support to hypothesis *H3*, the overall results in *Tables 8* and *12* do support hypothesis *H3*.

5.2.6 Corporate governance characteristics

The monitoring role of long-term institutional investors may depend on the corporate governance quality of firms. I address this concern by controlling for main corporate governance characteristics, particularly CEO duality, CEO tenure, Independent NED on Board (%), Board Size, and Board Size^2. Panel A and Panel B of *Table 13a* replicate the estimation regressions in *Table 3* and *Table 4*, respectively, but controlling for firms' corporate governance. Panel A and Panel B of *Table 13b* replicate the models in *Table 5* and *Table 7*. The estimation results are consistent with the main previously reported results. Overall, my results on the negative effect of long-term institutional ownership on cash holdings and cash deviation and the positive moderating effect on the value of cash and the use of excess cash are robust after controlling for corporate governance characteristics.

5.2.7 The Possible effect of the 2007-2010 financial crisis

The relationship between long-term institutional ownership and cash holdings might be affected by the recent financial crisis. I address this concern by adopting subsample analysis. I replicate my main models using two subsamples, the first subsample excludes the years of the financial crisis and the other subsample only includes the years of the financial crisis. Panel A and Panel B of *Table 14a* replicate the estimation regressions in *Table 3*, but considering the possible effect of the financial crisis by using subsample analysis. Panel A and Panel B of *Table 14b* replicate the models in *Table 4* and Panel A and Panel B of *Table 14c* replicate the models in *Table 5*. The estimation results are consistent with the main previously reported results. Overall, my results on the negative effect of long-term institutional ownership on cash holdings and cash deviation and the positive moderating effect on the value of cash are robust after controlling for the possible effect of 2007-2010 financial crisis.

6. Conclusion

This study investigates the relationship between institutional investors' investment horizon and corporate cash holdings for publicly traded UK firms for the period 2000–2016. In particular, I study the effect of long-term institutional ownership on cash holdings and cash deviation from the optimal level. I further explore the moderating role of long-term institutional investors on the value of cash and the use of excess cash. This study incorporates both the potential agency costs related to excess cash holdings and the precautionary needs of cash holdings by firms. I argue that long-term institutional investors will act as effective monitors and their higher presence will be associated with lower cash deviation from the optimal cash level, better use of cash, and ultimately a higher value of cash holdings.

I find that the effect of long-term institutional investors on cash holding depends on the cash deviation from the optimal level. While long-term institutional ownership has a negative and significant effect on cash holdings, this relationship only exists for firms with excess cash and not for firms with a cash deficit. My findings further show that firms with a higher proportion of long-term institutional ownership increase their cash holdings when they have a cash deficit. Moreover, I find that institutional investors' investment horizon affects the value of cash holdings and the use of excess cash. Using both the stock excess return model and the value model, I find that long-term institutional ownership is associated with a higher value of cash holdings. I also find that firms with a higher proportion of long-term institutional ownership efficiently use these excess cash reserves in value-creating investments that enhance a firm's operating performance. Overall, my findings are consistent with my predictions on the positive monitoring role of long-term institutional investors in the context of corporate cash holdings.

This study extends the existing literature on cash holdings in several ways. First, instead of using only the cash level as the dependent variable, I also use the cash deviation from the optimal level to enable us to focus on the component of cash that is not attributed to the main determinants of cash holdings. This component of cash has a negative significant effect on firm performance and value.

Second, prior literature shows conflicting results on the effect of long-term institutional ownership on cash holdings; however, this study shows some evidence that may explain this

contradictory outcome. My findings show that the effect of long-term institutional ownership on cash holdings depends on the cash deviation (i.e. excess cash or cash deficit).

Lastly, this study, within one research context, provides a comprehensive investigation of the relationship between institutional investors' investment horizon and cash policies. This study not only focuses on the effect of long-term institutional investors on how much cash a firm holds, but also addresses how firms use this cash and how much this cash contributes to firm value.

The findings of this paper suggest several directions and avenues for future research. Given that my empirical results support prior studies on the negative effect of cash deviation from the optimal level of cash on a firm's value, future research should investigate the role of the firm's environment and characteristics on moderating this negative relationship. On the one hand, for example, is the negative effect of cash deficit on firms' operating performance and value more pronounced for firms that operate in industries with high growth or many investment opportunities?

While this paper confirms prior results on the negative effect of excess cash on firm's value of future operating performance and finds that long-term institutional ownership not only decreases excess cash but also positively moderates its negative effect, this paper did not distinguish between firms based on their exposure to the risk/costs of holding excess cash (i.e. firms with high agency and/or principal costs, weak internal governance or high cost of carry) or the need/benefits to hold more cash (i.e., financially constrained firms, during financial distress/crisis, or/and firms with uncertain/high investment opportunities).

Moreover, this study did not investigate the speed of adjustment towards the optimal level of cash or the effect of adjustment costs of cash holdings. It may be interesting to explore the relationship between long-term institutional ownership and the speed of adjustment how the adjustment costs will moderate this relationship. While I show modest evidence that long-term institutional ownership decreases (increases) excess cash accumulation (dissipation), dynamic models are more appropriate to examine the adjustment towards the optimal level of cash.

7. References

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Essay 3. The effect of investor horizon on shareholder proposals in the UK*

Abstract

This paper aims to study the role of investor horizon on shareholder proposals in the context of UK listed firms from 1998 to 2016. Building on the agency view and the monitoring function of institutional investors, I particularly investigate the influence of institutional investors with a long-term investment horizon on the probability of shareholder proposals targeting, market reaction to shareholder proposals, and voting outcome of these proposals. First, the targeting analysis shows that firms with larger proportions of long-term institutional investors are less likely to be targeted by shareholder proposals. Then, I show that while cumulative abnormal returns (CARs) around the general meeting dates are negative on average, firms with more long-term investors experience positive CARs. Finally, the voting outcome analysis shows that long-term institutional investors are less likely to cast dissenting votes on shareholder proposals using several proxies for voting outcome. In further analysis, I show the established relationship in the literature, between pressure-resistant institutional ownership and shareholder proposals' targeting and outcomes, is more pronounced for long-term investors. This paper not only confirms the previously reported important role of investor horizon on influencing a firm's policies, governance and strategies, but also provides evidence on how such impact has occurred.

Keywords: *Cumulative abnormal return (CAR), investment horizon, institutional ownership, shareholder dissent, shareholder proposals, shareholder voting, targeting analysis*

*This paper has been peer-reviewed and accepted at the CGIR Paper Development Workshop during the 6th Annual International Corporate Governance Society Conference – ICGS 2020 where it has been presented on November 2020.

1. Introduction

Loyalty (hold), exit (trade), or voice (activism) are the main channels in modern corporations through which shareholders are able to re-act and pro-act to a firm's performance and strategies (Davis and Thompson, 1994; Hirschman, 1970). Gillan and Starks (2007) describe the possible responses of shareholders to corporate performance as a continuum, with one end being trading the shares and the other end being initiating takeovers or buyout. Positive shareholder activism lays between these two ends of this continuum. Thus, shareholder activism may take different forms such as voting at a firm's general meeting, private intervention with the firm's management, public campaigns, and shareholder proposals. This study investigates shareholder activism through focusing on shareholder proposals.

Despite the diverse legal and regulatory frameworks, shareholder proposals have been increasingly employed by investors around the world. This consistent increase in the use of shareholder proposals not only coincides with an increase in the voting in favour of shareholder proposals (Gillan and Starks, 2007; Cziraki, Renneboog and Szilagyi, 2010; Renneboog and Szilagyi, 2011), but also with the marginal value of these proposals increasing over time (Denes, Karpoff and McWilliams, 2017). This global phenomena, which started in the US and has then been documented in other countries, attracts scholars to empirically investigate which of a firm's characteristics attract shareholder proposals and how existing shareholders react (i.e. vote and trade) to shareholder proposals. Although the empirical shareholder proposal literature has been expanding since the 1990s, most studies mainly focus on US firms; however, many recent papers have documented inconsistent evidence with previously reported results (Buchanan et al., 2012; Denes, Karpoff and McWilliams, 2017; Goranova et al., 2017). In this paper, I aim to contribute to the shareholder proposal literature by investigating the role of institutional investors on shareholder proposals using a long and recent dataset of UK public firms. In particular, I examine the effect of institutional investors' investment horizon on the probability of shareholder proposals targeting and the reaction of existing shareholders towards shareholder proposals.

Prior studies mainly focus on the determinants and outcomes of shareholder proposals. While the existing results are still mixed and inconclusive, there is an overall consensus on the main determinants and consequences of shareholder proposals [For recent reviews on the determinants and outcomes, see Denes, Karpoff and McWilliams (2017) and Goranova and Ryan (2014)]. For example, shareholder proposals are more likely to target large and heavily

levered firms. Moreover, firms with poor stock price and operating performance and weak corporate governance are more likely to be targeted by shareholder proposals. Other studies focus on CEO incentives (i.e. equity holdings and compensation) and board structure. However, the findings of the outcomes of shareholder proposals have changed over time and have mainly focused on market reaction and voting outcome. For example, while the earlier literature documents no or negative evidence on the market price reaction to shareholder proposals, recent studies show a positive market reaction, especially for well-governed firms (Borokhovich et al., 2006; Renneboog and Szilagyi, 2011; Cuñat, Gine and Guadalupe, 2012). Moreover, the voting in favour of shareholder proposals and the adoption of the non-binding proposals have been increasing. The literature also provides weak and inconsistent evidence on future operating performance, CEO (turnover/compensation), and governance and other corporate practices. Despite prior studies using several theoretical lenses to interpret their findings, agency theory is by far the most used perspective (Goranova and Ryan, 2014). Overall, the existing literature built on agency theory suggests that firms with lower potential agency concerns are less likely to be targeted by shareholder proposals; and, if they are targeted, these proposals are more likely to receive positive voting and positive market reaction around the submission.

Building on the agency theory (Jensen, 1986), I argue that the investor horizon affects the probability of shareholder proposals targeting firms and the outcomes of these proposals. Institutional investors with a longer investment horizon have more incentives and capabilities to monitor a firm's management and board (Gillan and Starks, 2007) and are more likely to intervene with their investee firms (Ryan and Schneider, 2002; McCahery, Sautner and Starks, 2016), ultimately improving firms' corporate decisions and governance (Harford, Kecskés and Mansi, 2018) and firm's performance (Yin, Ward and Tsolacos, 2018). Long-term institutional investors are more likely to bear the costs associated with information collecting, as they obtain greater benefits thorough monitoring to enhance firm performance (Chen, Harford and Li, 2007; Borochin and Yang, 2017). Because of the efficient monitoring, firms with a large presence of long-term institutional investors have a lower cost of equity (Attig et al., 2013) and cost of debt (Elyasiani, Jia and Mao, 2010), their investments are less sensitive to cash flow (Attig et al., 2012) and boosted when the firm is undervalued, are more likely to extract benefits from merger and acquisitions (Gaspar, Massa and Matos, 2005), and are less exposed to insider trading (Fu et al., 2020) and earnings management (Wang, 2014). Therefore, I argue that focusing on the investment horizon may enhance understanding and provide consistent results

on the role of institutional investors on the determinants and the outcomes of shareholder proposals.

Prior studies have investigated the role of institutional ownership on shareholder proposals; however, most studies focus on US firms, and they report mixed results. In particular, studying the determinants of governance-related (i.e. board composition, executive pay, and anti-takeover provisions) shareholder proposals, some studies document a positive relationship between institutional ownership and the probability of proposals targeting (Karpoff, Malatesta and Walkling, 1996; Bizjak and Marquette, 1998; Cai and Walkling, 2011), while other scholars show a negative relationship (Ertimur, Ferri and Muslu, 2011; Renneboog and Szilagyi, 2011).

However, some literature argues that the effect of institutional ownership might be heterogeneous, as the existing or potential business ties between the investee firm and some institutions (i.e. pressure-sensitive institutions such as banks and insurance companies) may lessen the monitoring function of such institutions (Brickley, Lease and Smith, 1988; Gordon and Pound, 1993). Differentiating between pressure-sensitive and pressure-insensitive institutions, Cziraki, Renneboog and Szilagyi (2010) find that pressure-insensitive ownership is positively related to shareholder proposals targeting, whereas Renneboog and Szilagyi (2011) find that firms with a higher presence of pressure-insensitive institutions are less likely to be targeted by shareholder proposals. However, the two papers study different contexts: European and US firms, respectively.

The findings reported by the literature, mainly using the US context, on the effect of institutional ownership on the outcome of shareholder proposals are also mixed. On the one hand, the relationship between market price reaction to shareholder proposals and institutional ownership is shown to be negative (Thomas and Cotter, 2007); other studies find no statistically significant evidence for this relationship (Borokhovich et al., 2006; Cziraki, Renneboog and Szilagyi, 2010; Renneboog and Szilagyi, 2011).

On the other hand, the literature also documents positive (Thomas and Cotter, 2007; Ertimur, Ferri and Stubben, 2010; Cai and Walkling, 2011; Renneboog and Szilagyi, 2011), negative (Morgan et al., 2011), and not statistically significant (Gordon and Pound, 1993; Bizjak and Marquette, 1998; Cziraki, Renneboog and Szilagyi, 2010) relationships between institutional ownership and positive voting on shareholder proposals. This study focuses on

institutional investors with a long-term investment horizon and, as mentioned above, these investors have more incentives and capabilities to effectively monitor their investee firms and improve firms' governance and performance. Firms that are well-governed are less likely to be targeted by shareholder proposals and more likely to experience positive market reaction and positive voting. Thus, I expect that firms with a higher presence of long-term institutional investors would have a low probability of receiving shareholder proposals, but are more likely to have positive market reaction and positive voting on these proposals.

This study investigates the role of the investment horizon of institutional investors on shareholder proposals submitted to publicly traded UK firms over a long period from 1998 to 2016. Besides the high presence of institutional investors in UK firms (Ferreira and Matos, 2008) and their active monitoring and engagement role with their investee firms (Aguilera et al., 2006; Hendry et al., 2007), the UK's corporate law and governance systems provide an interesting context within which to study the relationship between institutional ownership and shareholder proposals. In the UK, regulators and policymakers tend to empower shareholders to engage with their investee firms, which can be clearly seen through shareholder rights granted by corporate law (Davies, Mulley and Bardell, 2019). The Companies Act 2006, Combined Code of Corporate Governance, and Stewardship Code are some examples of the encouraging legal environment towards shareholder activism. Indeed, Davies, Mulley and Bardell (2019) argue that the UK's legal and regulatory framework of shareholder rights is the most empowering for shareholder activism when comparing to other European country frameworks.

Despite the many similarities in the corporate governance systems and institutional ownership structure between the UK and US, there are some legal and institutional differences that show that the UK tends to empower shareholder activism more (Filatotchev and Dotsenko, 2015). Importantly for this study, the US and UK have some fundamental differences in the rules that regulate shareholder proposals (i.e. the binding nature of proposals and calling for general meetings; see detailed discussion below in the background section) (Becht et al., 2009; Buchanan et al., 2012).

Overall, the shareholder proposal is a powerful governance tool available to shareholders in the UK to implement corporate changes in their investee firms, and is even more powerful than in the US (Buchanan et al., 2012). Important differences between the UK and US and other European countries also exist in the practical implementation by activist

shareholders and the reaction by other voting shareholders towards these shareholder proposals. For example, the majority of UK shareholder proposals are submitted for issues related to the board and are more likely to receive positive votes (Cziraki, Renneboog and Szilagyi, 2010; Buchanan et al., 2012; Filatotchev and Dotsenko, 2015).

Despite the interesting context of the UK for the study of shareholder proposals, there exist a limited number of studies that investigate the determinants and outcomes of shareholder proposals in such a context (Cziraki, Renneboog and Szilagyi, 2010; Buchanan et al., 2012; Filatotchev and Dotsenko, 2015). In my study, I aim to broaden the empirical literature of shareholder proposals by not only providing additional evidence from the UK, but also by conducting a comprehensive analysis of shareholder proposals using a long and recent sample of shareholder proposals. Recent and comprehensive evidence on the determinants and outcomes of shareholder proposals is important, as recent literature documents the evolution over time of the use of shareholder proposals by activist shareholders, positive market reaction around proposal submission, and positive votes cast by voting shareholders.

Additionally, this study contributes to the literature on the role of investor horizon on firm decision-making. On the one hand, while empirical studies mainly focus on the correlation relationship between investor horizon and several firms' corporate decisions and governance practices, little is known about how that correlation occurs. I investigate how institutional investors with a long-term horizon interact with shareholder proposals, as it is an important governance tool for corporate change.

On the other hand, this study argues that it is important to differentiate between institutional investors based on their investment horizon when studying shareholder activism. In particular, while the literature on shareholder proposals mainly documents that institutional ownership and shareholder proposals targeting are positively correlated, such results are contradictory to the common expectation of the effective monitoring function of institutional shareholders (Goranova et al., 2017). I conversely show that institutional ownership of long-term shareholders decreases the likelihood of shareholder proposals targeting.

Moreover, my findings on the market reaction to shareholder proposals submission show that firms with a higher presence of long-term institutional investors experience positive market reaction (i.e. positive cumulative abnormal returns [CAR] around general meetings with shareholder proposals), although many prior studies document negative reaction or in most

cases not statistically significant evidence. Finally, as mentioned above, the literature shows a positive and negative relationship between institutional ownership and the positive voting on shareholder proposals. However, I find consistent results for the positive voting on shareholder proposals in firms with a high proportion of long-term institutional ownership.

The rest of the paper is organized as follows: Section 2 presents the theoretical background and hypothesis development, Section 3 presents the econometric specifications for targeting and outcome analyses, Section 4 shows the data sources, Section 5 presents the results of the study, and Section 6 provides the conclusion.

2. Literature Review and Hypotheses Development

2.1 Literature review

2.1.1 Shareholder proposals

Shareholder activism has become a common institutional factor to create changes in corporate strategy, governance, and ultimately performance (Goranova and Ryan, 2014). Shareholder activism may take different forms, ranging from private engagement with management (McCahery, Sautner and Starks, 2016) to public intervention (Gillan and Starks, 2007). Shareholder activists also may have a different time horizon, from short-term purposes (e.g., some hedge funds) (Brav et al., 2008; Klein and Zur, 2009, 2011) to long-term objectives (Hendry et al., 2007; Brav et al., 2018; Gloßner, 2019).

However, regardless of the form that has been used or the time horizon of the activist, the ultimate goal is most likely to improve firm performance (Goranova and Ryan, 2014). Previous literature on shareholder activism supports this argument by documenting that weak corporate governance and underperformance are the most common incentives for shareholder activism [for a summary of antecedents of shareholder activism, see Goranova and Ryan, (2014)]. In their review of 73 empirical studies on the determinants and consequences of shareholder activism, Denes, Karpoff and McWilliams (2017) document that the marginal positive effect of shareholder activism has been increasing over time.

In this paper, I focus on shareholder proposals as one of the main public forms of shareholder activism (Buchanan et al., 2012). The number of shareholder proposals submitted to listed firms has been increasing over time (Gillan and Starks, 2007; Buchanan et al., 2012; Filatotchev and Dotsenko, 2015). This increase in shareholder proposals may represent

activists' belief in the effectiveness of submitting proposals as a tool for corporate change (Renneboog and Szilagyi, 2011). Shareholder proposals are also considered to be a cost-effective mechanism to implement corporate change compared with other channels of public activism (Bauer, Moers and Viehs, 2015). In addition, not only has the number of submitted proposals increased, but also the voting in favour of shareholder proposals (Gillan and Starks, 2000, 2007; Renneboog and Szilagyi, 2011), and the adoption of shareholder proposals by management (Thomas and Cotter, 2007; Ertimur, Ferri and Stubben, 2010) has grown over time. A recent paper by He, Kahramn and Lowry (2020) shows that investors' support levels for shareholder proposals are informative regarding future risks that firms face, even if these proposals fail to be adopted/implemented.

Prior studies mainly focus on investigating the determinants and outcomes of shareholder proposals, although primarily in a US context. To identify the main determinants for shareholder proposals' targeting, studies focus on firms' corporate policies and characteristics, stock price performance, operating performance, ownership structure, and governance issues (Karpoff, Malatesta and Walkling, 1996; Strickland, Wiles and Zenner, 1996; Wahal, 1996; Bizjak and Marquette, 1998; Cziraki, Renneboog and Szilagyi, 2010; Ertimur, Ferri and Stubben, 2010; Ertimur, Ferri and Muslu, 2011; Renneboog and Szilagyi, 2011; Eding and Scholtens, 2017; Goranova et al., 2017, Gloßner, 2019). Although some studies focus on a specific type of shareholder proposal (i.e. corporate governance (Karpoff, Malatesta and Walkling, 1996; Renneboog and Szilagyi, 2011), executives' pay (Cai and Walkling, 2011; Ertimur, Ferri and Muslu, 2011), and corporate social responsibility (Eding and Scholtens, 2017; Gloßner, 2019) and poison pills (Bizjak and Marquette, 1998)), there exist main determinants that show consistent evidence on their significant effect on the probability of shareholder proposals targeting.

In particular, shareholder proposals are more likely to target firms with large size, high debt, low stock return, poor operating performance, low insider ownership, and a highly independent board. However, the literature has failed to provide consistent results for the effect of institutional ownership on the probability of shareholder proposals targeting, although it is repeatedly studied as an important potential determinant (Goranova et al., 2017). While many studies find that an increase in institutional ownership is associated with an increase in the probability of shareholder proposals targeting (Karpoff, Malatesta and Walkling, 1996; Cziraki, Renneboog and Szilagyi, 2010; Cai and Walkling, 2011), other studies document a negative

relationship (Ertimur, Ferri and Muslu, 2011; Renneboog and Szilagyi, 2011; Eding and Scholtens, 2017). Overall, activist shareholders tend to target underperformed and poor-governed firms by submitting proposals.

Another trend of the literature studies the outcomes of shareholder proposals. The market reaction to shareholder proposals is by far the most studied factor in the literature. Prior studies mainly use stock abnormal return around the initial press announcement of shareholder proposals (Karpoff, Malatesta and Walkling, 1996; Wahal, 1996), the proxy mailing date (Strickland, Wiles and Zenner, 1996; Prevost and Rao, 2000; Cai and Walkling, 2011; Renneboog and Szilagyi, 2011) or the general meeting date (Thomas and Cotter, 2007; Cziraki, Renneboog and Szilagyi, 2010; Cuñat, Gine and Guadalupe, 2012) to understand how market participants (i.e. existing shareholders of targeted firms and other investors) react to such an event.

Although the shareholder proposal is a governance device to propose corporate changes, many studies document a negative market reaction. However, recent studies argue and find that market participants positively react to shareholder proposals that have targeted well-governed firms (Borokhovich et al., 2006; Renneboog and Szilagyi, 2011; Cuñat, Gine and Guadalupe, 2012). Moreover, many studies focus on the operating performance of targeted firms and expectations of higher future performance; however, most of these studies failed to find consistent supporting evidence (Karpoff, Malatesta and Walkling, 1996; Strickland, Wiles and Zenner, 1996; Prevost and Rao, 2000; Buchanan et al., 2012).

Other studies investigate CEO turnover and compensation, and while most of these studies find no significant difference between targeted and controlled firms (Karpoff, Malatesta and Walkling, 1996; Rosenstein and Wyatt, 1997; Del Guercio and Hawkins, 1999), some papers show modest evidence for higher CEO turnover (Buchanan et al., 2012) and lower compensation (Ertimur, Ferri and Muslu, 2011) for targeted firms. Scholars also study the effect of shareholder proposal submission on other outcomes, such as corporate policies, namely, payout (Smith, 1996; Del Guercio and Hawkins, 1999) and capital expenditure (Smith, 1996; Cuñat, Gine and Guadalupe, 2012), earning management (Hadani, Goranova and Khan, 2011), governance issues (Bizjak and Marquette, 1998; Prevost, Rao and Williams, 2012; Marquardt and Wiedman, 2016), and corporate social responsibility (Gloßner, 2019).

Furthermore, the voting outcome of shareholder proposals and the implementation/adoption of the non-binding proposals (i.e. those which have not exceeded the required majority vote or are not binding by law even if they do exceed) are common aspects examined in the literature (Gordon and Pound, 1993; Strickland, Wiles and Zenner, 1996; Bizjak and Marquette, 1998; Gillan and Starks, 2000; Thomas and Cotter, 2007; Ertimur, Ferri and Stubben, 2010; Renneboog and Szilagyi, 2011). Prior studies generally examine similar determinants of shareholder proposals targeting as determinants for the voting outcome. However, the literature also finds that the type and sponsor of shareholder proposals affect the voting outcomes (Gordon and Pound, 1993; Gillan and Starks, 2000; Thomas and Cotter, 2007; Ertimur, Ferri and Stubben, 2010; Bauer, Moers and Viehs, 2015).

In the context of the implementation/adoption of shareholder proposals, besides the determinants of the voting outcome, prior studies argue and find that the management/board are more likely to implement/adopt shareholder proposals that have received a high number of positive votes (Thomas and Cotter, 2007; Ertimur, Ferri and Stubben, 2010). Overall, a firm's performance and governance and the proposal's type and sponsor are the main determinants of the voting outcomes of shareholder proposals; besides these factors, the voting outcome is also an important determinant of the implementation/adoption of shareholder proposals.

2.1.2 Proxy rules and practices in the UK

The government and investors associations in the UK continue to promote shareholder activism (Davies, Mulley and Bardell, 2019). Filatotchev and Dotsenko (2015) argue that the UK provides a favourable investment legal system for shareholder activism. In particular, proxy rules in the UK make the shareholder proposal a powerful governance tool for corporate changes (Buchanan et al., 2012). For example, a shareholder or group of shareholders with a 5% voting right could call for an enforceable emergency general meeting (EGM) to submit a proposal (Trevan et al., 2019), and this right is granted by statute and cannot be deprived even by a firm's articles of association (Buchanan et al., 2012).

Moreover, while in the US shareholders need costly contested solicitation to nominate board directors, shareholders in UK firms can simply submit a shareholder proposal with their nominees with no major cost of solicitation (Cziraki, Renneboog and Szilagyi, 2010). Indeed, the proxy rules provide the right for a shareholder to submit more than one proposal for the same general meeting. To submit a proposal in the UK, a shareholder must own at least 5% of

the firm's issued equity or submit as part of a group of 100 shareholders owning at least 100 GBP of equity in the targeted firm (Trevan et al., 2019).

The UK provides an interesting context to study shareholder proposals, as these proposals are binding. Unlike many other countries, including the US, shareholder proposals in the UK are binding in nature when they exceed the majority requirement for votes. This binding voting gives shareholders greater power to implement corporate changes so long as the majority of shareholders are in agreement. The binding nature of shareholder proposals also can be an effective disciplinary device for a firm's management (Levit and Malenko, 2011). Indeed, voting shareholders have been showing increasing support for shareholder proposals in recent years; however, the implementation/adoption of shareholder proposals is still limited, although increasing, for non-binding shareholder proposals (Levit and Malenko, 2011). For example, Ertimur, Ferri and Stubben (2010) document that, while 24.3% of shareholder governance proposals received majority voting, only 7.6% of proposals have been implemented in US firms.

When comparing with other European countries, UK firms show more intense shareholder activism through shareholder proposals (Cziraki, Renneboog and Szilagyi, 2010). Not only have small UK firms been targeted by shareholder proposals, but also large UK firms have been targeted as well, such as Vodafone, Sainsbury's, HSBC, and Tesco (Filatotchev and Dotsenko, 2015). Shareholder proposals submitted to UK firms are more likely to receive majority voting than shareholder proposals in other European firms (Cziraki, Renneboog and Szilagyi, 2010). Another distinctive characteristic of shareholder proposals in the UK is that they mainly seek board changes. In particular, while shareholder proposals seeking corporate board changes represent 30% in US firms (Buchanan et al., 2012) and 10.5% in European firms (Cziraki, Renneboog and Szilagyi, 2010), the figure for these types of proposals in the UK has been calculated as 66.2% (Cziraki, Renneboog and Szilagyi, 2010) or even 85% (Buchanan et al., 2012). Although the probability of shareholder proposals receiving majority votes is higher in the UK than in other European countries, the proposals related to board changes still have a higher probability of being passed in UK firms (Cziraki, Renneboog and Szilagyi, 2010).

2.2 Hypotheses development

This paper aims to study the role of investor horizon in a firm's decision-making by focusing on three aspects of shareholder proposals. As aforementioned, prior studies in

shareholder proposals literature mainly focus on the determinants (i.e. the likelihood of a firm being targeted by shareholder proposals) and the outcomes of shareholder proposals. In the context of the outcomes, while operation performance, corporate policies, and governance features are studied by scholars, the market reaction and the voting outcome are by far the most common aspects examined in the literature. Therefore, I focus on the influence of institutional investors with a long-term horizon on the likelihood of shareholder proposals targeting, market reaction to shareholder proposals submission, and voting outcome of shareholder proposals, which are discussed below.

2.2.2 Likelihood of shareholder proposals targeting

Recent literature shows that good corporate governance quality decreases the likelihood of a firm being targeted by shareholder proposals (Renneboog and Szilagyi, 2011). Moreover, shareholders consider a firm's ownership structure when submitting shareholder proposals (Cziraki, Renneboog and Szilagyi, 2010; Renneboog and Szilagyi, 2011). Shareholder activism literature attributes the increase in shareholder activism to the increase in institutional ownership (Denes, Karpoff and McWilliams, 2017). Many papers document a positive relationship between both institutional ownership and ownership concentration with the likelihood of shareholder activism (Goranova and Ryan, 2014).

Yet, given that institutional ownership is considered an external corporate governance mechanism, and institutional ownership improves firms' governance quality (Harford, Kecskés and Mansi, 2018), the aforementioned findings—that governance quality decreases shareholder proposals and institutional ownership increases proposal submission—are puzzling. If institutional ownership always increases corporate governance quality, firms with a higher proportion of institutional ownership will be in less need of shareholders' public intervention. However, this contradiction may be attributed to the heterogeneity between institutional shareholders in terms of governance structure and regulatory requirements (Boyd and Solarino, 2016), information asymmetry (Chen, Harford and Li, 2007), and even voting and activism behaviour (Bauer, Moers and Viehs, 2015; Marquardt and Wiedman, 2016; McCahery, Sautner and Starks, 2016; Stathopoulos and Voulgaris, 2016; Benton and You, 2018; Gloßner, 2019).

The investment horizon of shareholders is an important factor that determines the monitoring effectiveness of institutional ownership (Chen, Harford and Li, 2007; Gillan and Starks, 2007; McCahery, Sautner and Starks, 2016; Harford, Kecskés and Mansi, 2018, Yin,

Ward and Tsolacos, 2018). Thus, long-term institutional ownership improves corporate governance quality (Doidge et al., 2015; McCahery, Sautner and Starks, 2016; Borochin and Yang, 2017). In addition to improving corporate governance quality, recent studies document the positive effects of long-term institutional ownership on firms' financial reporting quality (Bushee, Goodman and Sunder, 2018), insider trading and earning management (Wang, 2014; Fu et al., 2020), innovation (Bushee, 1998), corporate social responsibility (Durand, Paugam and Stolowy, 2019; Fu, Tang and Yan, 2019; Gloßner, 2019), director pay policies (Dong and Ozkan, 2008; Stathopoulos and Voulgaris, 2016), corporate investing policies (Cella, 2010), corporate financing policies (Cleary and Wang, 2017), and payout policies (Gaspar et al., 2012).

Moreover, shareholders with a long-term investment horizon are better informed (Huang and Petkevich, 2016; Borochin and Yang, 2017) and actively engage with management behind the scenes (McCahery, Sautner and Starks, 2016). While long-term institutional shareholders are more likely to vote in support of say-on-pay proposals, firms with a higher proportion of long-term institutional ownership are less likely to have excess executive pay (Stathopoulos and Voulgaris, 2016). Thus, given that long-term institutional shareholders prefer and have the ability to privately engage with their investee firms (McCahery, Sautner and Starks, 2016) and they improve the firms' corporate decision-making and governance (Harford, Kecskés and Mansi, 2018), I argue that firms with higher proportions of long-term institutional ownership are less likely to be targeted by shareholder proposals[13]. Therefore, I hypothesize:

H1: *Firms with a higher presence of long-term institutional investors are less likely to be targeted by shareholder proposals.*

2.2.3 Market reaction to shareholder proposals

Previous literature documents contradictory results on the market reaction to shareholder proposals (Denes, Karpoff and McWilliams, 2017). Although the shareholder

[13] Brandes, Goranova and Hall (2008) propose a conceptual view of two dimensions on how firms interact with institutional investors. They suggest that firms' interactions with shareholders would vary depend on the timing (responsive versus anticipatory) and the nature of firm response (substantive versus symbolic). Because of the intensive behind-the-scenes engagement of long-term institutional investors (McCahery, Sautner and Starks, 2016) and their long investment horizon in the firm, I expect that the interaction/response of firms with a higher presence of long-term institutional ownership are more likely to be anticipatory and substantive. In such an environment of anticipatory and substantive interaction/response by the firm's management, shareholders are in less need to engage in public activism (i.e. submitting proposals). Although Brandes, Goranova and Hall (2008) discuss their conceptual view within the context of compensation plans, I expect it to be compatible with other important corporate decisions/actions.

proposal is considered as an important governance mechanism for corporate change, interestingly, most literature reports a negative market price reaction to shareholder proposals (Karpoff, Malatesta and Walkling, 1996; Smith, 1996; Del Guercio and Hawkins, 1999; Prevost and Rao, 2000; Cziraki, Renneboog and Szilagyi, 2010), although some results are not statistically significant. However, recent evidence shows that the corporate governance quality of targeted firms affects the market price reaction to shareholder proposals (Borokhovich et al., 2006; Renneboog and Szilagyi, 2011; Cuñat, Gine and Guadalupe, 2012).

Renneboog and Szilagyi (2011) document a positive market price reaction to passed shareholder proposals, but this relationship is larger for strongly governed targeted firms. Using the regression discontinuity design, Cuñat, Gine and Guadalupe (2012) find that shareholder proposals that receive majority voting by a small margin cause positive abnormal returns. They also confirm that the positive market reaction is larger for governance proposals and in well-governed firms. Furthermore, Borokhovich et al. (2006) find that well-monitored targeted firms experience a better market price reaction around shareholder proposals than less monitored targeted firms. As firms with a higher proportion of long-term institutional ownership seem to be well-monitored and governed, I expect these firms will experience positive abnormal returns in response to shareholder proposals.

The investment horizon of investors plays an important role in market price stability. Institutional investors with a long investment horizon foster CEOs through compensation contracts to pursue long-term market value rather than a short-term increase in stock price (Cadman and Sunder, 2014). Firms with larger proportions of long-term institutional ownership have lower idiosyncratic volatility than other firms with more short-term institutional investors (Chichernea, Petkevich and Zykaj, 2015). In fact, in response to market shocks, the stock market prices are more stable for firms held mostly by long-term institutional investors, while the stock prices of firms held mostly by short-term institutional investors experience amplified drops (Cella, Ellul and Giannetti, 2013). Therefore, I hypothesize:

H2: *An increase in the presence of long-term institutional investors is associated with an increase in the positive market reaction to shareholder proposals.*

2.2.4 Voting outcome of shareholder proposals

Besides the influence of institutional ownership structure on the market reaction to shareholder proposals, the voting outcome of shareholder proposals varies with the institutional ownership structure. Most of the shareholder proposals literature mainly differentiates between insider/CEO ownership and institutional ownership, and documents that insider/CEO ownership decreases and institutional ownership increases the votes cast in favour of shareholder proposals (Gordon and Pound, 1993; Gillan and Starks, 2000; Thomas and Cotter, 2007; Ertimur, Ferri and Stubben, 2010). Some studies argue there exists heterogeneity in the voting behaviour of institutional shareholders towards shareholder proposals (Cziraki, Renneboog and Szilagyi, 2010; Cai and Walkling, 2011; Renneboog and Szilagyi, 2011).

Renneboog and Szilagyi (2011) and Cziraki, Renneboog and Szilagyi (2010) argue that pressure-insensitive institutional shareholders are more likely to vote in favour of shareholder proposals, as they are less likely to have existing or potential business ties with the investee firms. Conducting their study on only corporate governance shareholder proposals submitted to US firms between 1996 and 2005, Renneboog and Szilagyi (2011) find supporting evidence for their argument. However, Cziraki, Renneboog and Szilagyi (2010) study all shareholder proposals in the UK and some other European countries from 1998 to 2008 and find no statistically significant evidence to support their argument. However, in counter to their expectation, one of their models reveals that pressure-sensitive institutional ownership increases the voting in favour of shareholder proposals.

In this paper, I also argue that the voting outcome of shareholder proposals varies with the institutional ownership structure. However, instead of arbitrarily classifying institutional shareholders based on their types, I use the investment horizon of institutional shareholders at investee firm level. The investment horizon plays an important role in the activism behaviour of institutional investors (Ryan and Schneider, 2002; Ashraf, Jayaraman and Ryan, 2012; McCahery, Sautner and Starks, 2016). For example, Stathopoulos and Voulgaris (2016) find that long-term institutional investors are more likely to vote in favour of management-sponsored say-on-pay proposals, although firms with a higher proportion of long-term ownership are less likely to have excess executive pay. Moreover, long-term institutional investors tend to improve a firm's long-term value and enhance its governance through their consistent and effective monitoring. Shareholder proposals are more likely to be passed in well-

performing and well-governed firms as well. I expect that long-term institutional ownership increases the positive voting on shareholder proposals. Therefore, I hypothesize:

H3: *An increase in the presence of long-term institutional investors is associated with an increase (decrease) in the positive (dissenting) votes on shareholder proposals.*

3. Econometric Specifications

3.1 Targeting analysis

To test hypothesis *H1* on the probability of targeting firms by shareholder proposals, I conduct logistic regression models (Karpoff, Malatesta and Walkling, 1996; Bizjak and Marquette, 1998; Cziraki, Renneboog and Szilagyi, 2010; Renneboog and Szilagyi, 2011; Marquardt and Wiedman, 2016; Gloßner, 2019). I estimate the following specification:

$$Target\ Firm_{it} = \beta_1 LTIO_{it} + \beta_2 IO_{it} + \beta_3 CG_{it} + \beta_4 X_{it} + \epsilon_{it}, \qquad (1)$$

where $Target\ Firm$ is a dummy variable that equals 1 for firms being targeted by at least one shareholder proposal and zero for matched-peer firms. $LTIO$ is the ratio of long-term institutional ownership. I control for three sets of firm-specific characteristics: IO is the firm-ownership controls, CG is the firm-governance controls, and X represents firm-financial controls. ϵ is an i.i.d. error term.

Following previous studies (Karpoff, Malatesta and Walkling, 1996; Bizjak and Marquette, 1998; Borokhovich et al., 2006; Cziraki, Renneboog and Szilagyi, 2010; Marquardt and Wiedman, 2016), I use an industry-size matching procedure for my targeting analysis. For each target firm in an event year, I match a peer with the closest size within the same two-digit Standard Industrial Classification (SIC) industry code. To ensure that my results are not driven by the proxy I used for size, I use four different proxies for size (market-to-book, total assets, revenue, and market capitalization). Moreover, I run my target analysis model pooling all match peers with the different size proxies as matched firms.

3.2 Outcome analyses

To test my second and third hypotheses (*H2* and *H3*) on the relationship between long-term institutional ownership and the outcome of shareholder proposals, I conduct both linear

and logistic regression models. I distinguish between two types of shareholder proposal outcomes.

Market reaction analysis: The first type of outcome of shareholder proposals is a performance outcome, in which I use CARs as my dependent variable (Karpoff, Malatesta and Walkling, 1996; Gillan and Starks, 2000; Borokhovich et al., 2006; Thomas and Cotter, 2007; Cziraki, Renneboog and Szilagyi, 2010; Renneboog and Szilagyi, 2011). I estimate the following specification using the OLS regression model:

$$CAR_{it} = \beta_1 LTIO_{it} + \beta_2 IO_{it} + \beta_3 CG_{it} + \beta_4 Proposal_{it} + \beta_5 EGM_{it} + \beta_6 X_{it} + \epsilon_{it}, \quad (2)$$

where CAR is the CAR around the general meeting date. I use eight different event windows, from a two-day window to a one-month window, to calculate CAR. $LTIO$ is the ratio of long-term institutional ownership. I control for three sets of firm-specific characteristics: IO is the firm-ownership controls, CG is the firm-governance controls, and X represents firm-financial controls. I also control for proposal-level control; proposal topic (corporate governance [CG] proposals and corporate social responsibility [CSR] proposals) and proposal outcome (defeated and passed). Finally, I control for the type of general meeting, where EGM is a dummy variable that equals 1 if the proposal is put to vote in an EGM. ϵ is an i.i.d. error term.

Voting outcome analysis: The other type of outcome analysis is voting outcome, in which I use different proxies for shareholder dissent on shareholder proposals. For my voting outcome analysis, I estimate the following specification using logistic regressions (Cziraki, Renneboog and Szilagyi, 2010; Ertimur, Ferri and Muslu, 2011; Renneboog and Szilagyi, 2011; Bauer, Moers and Viehs, 2015; Matsusaka, Ozbas and Yi, 2019) and ordinary least squares regressions (Bizjak and Marquette, 1998; Gillan and Starks, 2000; Thomas and Cotter, 2007; Ertimur, Ferri and Stubben, 2010; Matsusaka, Ozbas and Yi, 2019):

$$Y_{it} = \beta_1 LTIO_{it} + \beta_2 IO_{it} + \beta_3 CG_{it} + \beta_4 Proposal_{it} + \beta_5 EGM_{it} + \beta_6 X_{it} + \epsilon_{it}, \quad (3)$$

where Y denotes the dependent variables for shareholder voting. I use three different proxies for shareholder voting: *Defeated* (*Passed*) is a dummy variable that equals 1 if the proposal is put to vote and does not (does) exceed the majority voting requirement, and *Dissent* is the logistic transformation of the ratio of votes against and voter abstains to the total votes cast. $LTIO$ is the long-term institutional ownership. I control for three sets of firm-specific

characteristics: IO is the firm-ownership controls, CG is the firm-governance controls, and X is firm-financial controls. I also control for *proposal* topic (CG proposals and CSR proposals) and emergency general meeting EGM. ϵ is an i.i.d. error term.

4. Data and Variables

4.1 Sample and data sources

To empirically test my hypotheses on the relationship between investor horizon and shareholder proposals in the context of UK traded firms on the London Stock Exchange (LSE) over the period 1998–2016, I collect my data from different sources.

First, I obtain the shareholder proposals data from the Manifest database. This database contains 792 shareholder proposals during the studied period; however, only 541 proposals were submitted to non-financial firms (financial firms are classified as those with SIC codes 6000–6999). These proposals have been submitted to 152 general meetings in 94 firms. Then, using Thomson Reuters Datastream database, I collect accounting and financial information for the UK firms traded on the LSE to match targeted firms with industry-size peer firms. I further collect ownership data for targeted and matched firms from Thomson Reuters Eikon *Ownership & Profiles* module. I obtain the most recent ownership data on the calendar quarter ending prior to the meeting date. Lastly, I collect CG characteristics from Manifest. To mitigate the potential effect of large outliers, all counting firm-level variables are winsorized at the top and bottom 1% level.

4.2 Variables

Dependent variable

Targeting analysis: My dependent variable for the targeting analysis is *Target Firm*. The dependent variable is defined as a dummy variable equal to 1 if the firm was targeted with at least one shareholder proposal at the given year, and zero for the industry-size matched firm. I use a two-digit SIC for industry identification, and I use four different proxies for size.

Market reaction analysis: I use the CAR, CAR, around the general meeting date as a proxy for market reaction to shareholder proposals. I use the Market model over the 200-day period ending 21 days prior to the general meeting date (Gordon and Pound, 1993; Gillan and Starks, 2000; Borokhovich et al., 2006; Cziraki, Renneboog and Szilagyi, 2010; Renneboog

and Szilagyi, 2011). I use the FTSE All Share as the benchmarking index in the model. I use eight different event windows around the general meeting date. The shortest windows are two-day windows, [-1,0] and [0.+1], and the longest window is a one-month window, [-10,+10].

Voting outcome analysis: I use three variables to proxy for the voting outcome of shareholder proposals. To ensure that my results are not driven by the proxy used for voting outcome, I use both indicator and continuous variables, similar to Ertimur, Ferri and Stubben (2010); Gine, Moussawi and Sedunov (2017); and Matsusaka, Ozbas and Yi (2019). For the indicator variable, two variables have been used. First, *Defeated* is a dummy variable that equals 1 if the shareholder proposal is put to vote, but does not exceed the majority voting requirement. The second indicator variable is *Passed*, which equals 1 if the shareholder proposal is put to vote and exceeds the majority voting requirement. Furthermore, I use shareholder dissent as the ratio of dissenting votes to the total votes cast. Following previous studies by Conyon (2016) and Alkalbani, Cuomo and Mallin (2019), I use the logistic transformation to ensure that the ordinary least squares estimator will predict probabilities within the range of zero to one. Thus, my third dependent variable for the voting outcome *Dissent* is defined as the logistic transformation of the ratio of abstains and against votes to the total votes cast.

Explanatory variables

My main explanatory variable is long-term institutional ownership, *long-term IO*. I measure institutional ownership variables as the total percentage of shares held by institutional shareholders to the total outstanding shares at the last quarter prior to the general meeting date. To test my hypotheses, I differentiate between institutional shareholders based on their investment horizon.

As proxy for investment horizon, I use the actual investment duration at the firm level for each institutional investor (Elyasiani and Jia, 2010; Attig et al., 2012; Wang, 2014, Yin, Ward and Tsolacos, 2018). Then, I aggregate at the firm-quarter level the institutional ownership using different thresholds of shareholders' investment horizons. Thus, *Long-term IO* (*Medium-term IO*/*Short-term IO*) is defined as the ratio of total shares held by long-term (medium-term/short-term) institutional shareholders with investment duration of at least eight

quarters (or more than four for medium-term, and less than four quarters/at most four quarters for short-term).[14]

Control variables

In my models about targeting and outcome analyses, I use three sets of the most common firm-level controls that have been used in the shareholder proposals literature (e.g. Karpoff, Malatesta and Walkling, 1996; Strickland, Wiles and Zenner, 1996; Gillan and Starks, 2000; Thomas and Cotter, 2007; Cziraki, Renneboog and Szilagyi, 2010; Ertimur, Ferri and Stubben, 2010; Cai and Walkling, 2011; Renneboog and Szilagyi, 2011; Bauer, Moers and Viehs, 2015). First, I control for a firm's stock performance, operating performance, and relevant characteristics, such as share return, share turnover, return on asset, total assets, leverage, R&D, and capital expenditure.

Second, I control for a broad set of the firm's CG characteristics, which includes board size, board size squared, the ratio of non-executive directors, the ratio of female directors, CEO duality, and CEO tenure.

Third, I control for the firm's ownership structure, which includes total institutional ownership, ownership concentration, CEO ownership, and CEO ownership concentration. In addition to the aforementioned controls, in the outcome analyses, I control for the proposal topic (CG proposals and CSR proposals) and EGM.

Finally, I also control for the voting outcome of shareholder proposals in my analysis of market reaction.

4.3 Descriptive statistics

Table 1 presents the number of shareholder proposals across the sample years by the topic of proposal and voting outcome. Panel A shows that 86.3% of shareholder proposals submitted to UK firms are related to CG issues. Indeed, 90% of the CG proposals are related to elections (200 proposals) and removal (216 proposals) of board directors. Although I study a longer period than previous studies that focus on UK shareholder proposals, a similar trend

[14] Using different thresholds for duration does not change my results. For example, I have also used 12 quarters for long-term institutional shareholders and 2 quarters for short-term institutional investors.

of the dominance of CG proposals has been reported. Cziraki, Renneboog and Szilagyi (2010) document that 77% of shareholder proposals summited in the UK between 1998 and 2008 are related to board and other governance issues.

In untabulated analysis, I check for the potential multi-collinearity in all my estimation models. I follow prior ownership literature and shareholder activism literature (e.g., Bushee, 1998; Callen and Fang, 2013; Kim et. al, 2016; Neubaum and Zahra; 2006; Sauerwald, Van Oosterhout and Van Essen, 2016; Tihanyi et. al, 2003) and adopt Variance Inflation Factor (VIF) analysis to test for multi-collinearity. I find that all VIFs of the independent variables in all my estimated regression models are below the conventional rule-of-thumb value of 10 (Neter et al, 1983). An exception is that there are two of the control variables, Board Size and CEO ownership, which are highly correlated with their powers, Board Size^2 and CEO ownership^2, and have high VIFs that exceed the value of 10. However, as all these variables are control variables not the variables of interests in my study and the high values are caused by the inclusion of powers, these high VIFs 'is not problem and can be safely ignored' (Allison, 2012). For robustness, I re-run my models without including Board Size^2 and CEO ownership^2, the VIFs of Board Size and CEO ownership diminish below 10 and the results are consistent my main models.

Table 1. Shareholder proposals across time

This table provides three panels for the distribution of the types of shareholder proposals submitted to UK firms and their voting outcome. Panel A shows the number of proposals related to corporate governance (CG), corporate social responsibility (CSR), or other issues across the years 1998–2016. Panel B presents the number of proposals that have been defeated, passed, or withdrawn per year. Panel C shows the average of the ratio of for, abstain or against votes to the total votes cast for all shareholder proposals submitted in each particular year.

Event Year	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	**Total**
										Panel A										
CG	2	13	3	3	8	1	38	18	19	37	29	47	47	20	7	54	35	41	45	***467***
CSR	0	1	2	2	1	1	3	1	2	2	1	1	1	1	3	2	3	4	6	***37***
Other	3	2	2	7	1	0	0	0	0	2	1	3	6	1	0	1	4	3	1	***37***
All	**5**	**16**	**7**	**12**	**10**	**2**	**41**	**19**	**21**	**41**	**31**	**51**	**54**	**22**	**10**	**57**	**42**	**48**	**52**	**541**
										Panel B										
Defeated	5	16	7	12	10	2	11	15	9	35	16	33	22	12	4	27	36	21	10	***303***
Passed	0	0	0	0	0	0	30	4	8	0	3	15	22	3	6	11	1	14	18	***135***
Withdrawn	0	0	0	0	0	0	0	0	1	6	2	3	5	7	0	3	5	7	10	***49***
Unknown	0	0	0	0	0	0	0	0	3	0	10	0	5	0	0	16	0	6	14	54
										Panel C										
For	6.1%	25.7%	19.3%	10.5%	18.9%	8.3%	48.9%	33.1%	45.2%	21.5%	19.1%	31.1%	40.7%	29.6%	49.6%	39.9%	19.7%	48.2%	56.5%	***30.1%***
Abstain	0.0%	1.5%	3.9%	8.1%	0.5%	2.5%	1.2%	1.5%	4.6%	2.4%	2.3%	0.8%	3.3%	4.3%	3.3%	1.3%	0.9%	1.5%	3.8%	***2.5%***
Against	93.9%	72.7%	80.2%	85.3%	80.7%	90.4%	49.5%	66.7%	53.0%	77.6%	79.9%	70.6%	56.4%	66.1%	46.9%	58.8%	80.0%	50.4%	39.7%	***68.4%***

Buchanan et al. (2012) report almost similar numbers to the present study, stating that 86% of proposals submitted by institutions are board and governance proposals, and the percentage is higher for other types of shareholders except retail shareholders. Panel A also shows that there is an increasing trend of CSR proposals. Particularly, while there were only 19 CSR proposals during the first 14 years (1998–2011), 18 CSR proposals have been submitted during the last five years of the sample.

Panel B of *Table 1* shows that the more than two-thirds of shareholder proposals put to vote do not exceed the majority voting requirement. Thus, almost 30% of shareholder proposals have received the majority voting requirement to pass, with Cziraki, Renneboog and Szilagyi (2010) also reporting a similar percentage. Further details are provided in Panel C, which presents the percentage of votes for and against shareholder proposals, as well as abstentions. On average, shareholder proposals submitted to UK firms received 30.1% for votes, 2.5% abstain votes, and 68.4% against votes. Overall, *Table 1* shows consistent results with prior literature on the upward trend on the number of shareholder proposals and the voting in favour of these proposals.[15]

Table 2 provides summary statistics for the means of target firms and the cross-sectional t-test results for the difference between the means of target firms and matched firms. *Table 2* shows that, while targeted firms have 41.3% of institutional ownership, matched firms, on average, have a larger proportion of institutional ownership by 8.5%. Further, target firms have a smaller proportion of long-term institutional ownership by 7.5% than matched firms. On the one hand, target firms are larger and have a larger board size and older non-executive directors; on the other hand, target firms experience lower stock return, return on asset, and share turnover, and also have a shorter CEO tenure and less women on the board.

[15] Figures C1, C2, and C3 in Appendix C visualize the number of shareholder proposals and voting outcomes across years.

Table 2. Summary statistics of target and matched firms

This table provides summary statistics for our main variables and controls of target firms and the t-test statistics of the mean differences between target firms and matched firms. A target firm is defined as one in which at least one shareholder proposal was submitted in a particular year. Each target firm is matched with a peer firm by year, industry (2-digit SIC) and size. Four different proxies have been used for size in our matching procedure: Market-to-book (MTB), total assets, revenue, and market capitalization. Detailed definitions of the remaining variables are reported in Appendix C Table C1. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

	Target Firms		**Matched Firms**				
			MTB	Total Assets	Revenue	Market Cap.	All Matched
	N	*Mean*	*Diff.*	*Diff.*	*Diff.*	*Diff.*	*Diff.*
Long-term IO	134	0.303	0.071**	0.087***	0.071**	0.070**	0.075***
Institutional Ownership	134	0.413	0.101***	0.094***	0.075**	0.071**	0.085***
Medium-term IO	134	0.044	0.025**	0.020	0.011	0.009	0.016*
Short-term IO	134	0.066	0.004	-0.014	-0.005	-0.008	-0.006
Blockholding (5%)	134	0.394	0.019	0.051	0.024	0.060*	0.039
Board Size	131	7.626	-0.752*	-0.787*	-0.382	-0.980**	-0.727**
Non-executive Ratio	131	0.613	-0.016	-0.013	-0.015	-0.041*	-0.021
Average Age Non-executive	123	60.191	-0.947	-1.168*	-1.986***	-0.965	-1.265**
Board Female Ratio	131	0.059	0.007	0.021*	0.019	0.004	0.013
CEO Duality	131	0.092	-0.013	-0.038	-0.044	0.001	-0.024
CEO Tenure	111	4.120	1.244*	0.760	0.667	1.719**	1.108*
CEO Ownership	127	0.238	-0.235	-0.234	-0.237	-0.159	-0.216
Share Return	124	-0.004	0.047	0.163*	0.110	0.211**	0.134**
Share Turnover	126	0.969	2.103	1.849	1.796	1.562	1.824*
Total Assets	136	13.745	-0.895***	-0.643**	-0.993***	-1.012***	-0.885***
Leverage	136	0.209	-0.020	0.023	-0.008	0.005	0.000
ROA	136	-0.094	0.072**	0.057*	0.063**	0.037	0.057**
Capital Expenditure	136	0.054	-0.010	0.005	0.012	0.007	0.004
R&D	136	0.006	0.001	0.000	0.005	0.005	0.003

Table 3 shows that the stock market in general reacts negatively to the submission of shareholder proposals. The negative reaction of the stock market is mainly pronounced around an EGM and a meeting with multiple shareholder proposals. While the CAR is negative and statistically significant at 1% for all event windows for defeated shareholder proposals, there is some evidence on the positive market reaction when shareholder proposals receive the majority voting requirement to pass. *Table 4* presents the market reaction to shareholder proposals based on the proportion of long-term institutional ownership of the target firm. While the first four quintiles show evidence of negative market reaction, interestingly, the fifth quintile, where target firms have the largest proportion of long-term institutional ownership, shows a positive market reaction for shareholder proposals.

Both *Tables 2* and *4* provide some evidence supporting my first and second hypotheses. *Table 2* shows that, consistent with *H1*, firms with a larger proportion of long-term institutional ownership are less likely to be targeted by shareholder proposals. *Table 4* shows that target firms with a higher proportion of long-term institutional ownership are more likely to experience positive CAR around shareholder proposal meeting dates. Such a result is consistent with my expectations in hypothesis *H2*. However, the next section provides more robust econometric estimations, controlling for firm, event, and proposal-level variables.

A deeper analysis of the market reactions to different mixes of proposals might be interesting to enrich the understating on where the stock market reaction exists. *Tables C2-C4* in appendix C provide further results for the market reactions with different mixes of shareholder proposals' types and outcomes. For one-proposal meetings, *Table C2* suggests there is some evidence on short-term negative market reaction around the general meeting if shareholder proposal is defeated. In the cases where the proposal is not defeated, there is also a significant short-term market reactions to CG proposals; however, while the market reaction is negative for proposals that aim to elect new director, it is positive when the proposals aims to remove exciting director. For meetings with multi shareholder proposals, *Table C3* shows similar results to *Table 3* on the negative market reactions to defeated shareholder proposals and around EGM, and positive reaction if at least one shareholder proposals has not been defeated. However, *Table C3* further shows that the negative reaction for defeated proposals is higher and only exist if the proposal has been defeated in EGM not the regular AGM, but the positive market reaction for not defeated proposals seems to exist for both EGM and AGM though the coefficients and significant level are much lower than in the case of defeated

proposals. Further differentiating between shareholder proposals types provides interesting results yet the number of observations are small to suggest robust conclusion. For example, it seems the negative market reaction for defeated proposals in EGM and positive market reaction for not defeated are only statistically significant for CG proposals that aim to elect new directors. Overall, results in *Table C2* and *C3* suggest that the outcome, defeated or not defeated, and the type of meeting, EGM or AGM, have the main influence on the market reaction to shareholder proposals, and to lesser extent that shareholder proposals that aim to elect new directors seem to have an effect on the market reaction.

Moreover, *Table C4* differentiates the market reactions between first time targeting by shareholder proposals and subsequent/not-first targeting meetings. Panel A shows that the negative market reaction for defeated shareholder proposals only exists in the first time firm is targeted by shareholder proposals, and Panel B shows that this negative reaction is driven by CG proposals, especially proposals that aim to remove existing directors, and EGM. Panel C shows that there is a positive market reaction around meetings with not defeated proposals that only exists for first time targeted meetings and is driven by CG proposals that aim to remove existing directors and EGM. *Table C4* shows supporting results on the importance of the outcome of shareholder proposals and type of meeting in determining the market reaction around the general meeting date; however, *Table C4* further provides evidence that the market reaction around shareholder proposals meetings mainly exists in the first time firm is targeted by shareholder proposals.

Table 3. Cumulative abnormal returns around shareholder proposals

This table shows the mean cumulative abnormal returns around the general meeting date by number of proposals per meeting, voting outcome of proposals, related issues of shareholder proposals, and meeting type. The Market model based on a 200-day period ending 21 days prior to the general meeting date has been used to calculate CAR. The FTSE All Share index has been used for benchmarking. The cross-sectional t-test has been used to test the significance of mean differences. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

	CAR							
	[-1,+1]	**[-1,0]**	**[0,+1]**	**[-2,+2]**	**[-1,+5]**	**[-1,+7]**	**[-5,+5]**	**[-10,+10]**
Shareholder proposal	-1.275***	-0.477**	-0.649**	-2.273***	-1.944***	-3.546***	-0.621	-1.226
	(-4.03)	(-1.99)	(-2.56)	(-4.62)	(-3.83)	(-6.68)	(-0.98)	(-1.57)
N	*444*	*444*	*444*	*444*	*444*	*444*	*444*	*444*
One-proposal per meeting	-1.077	-0.843	-1.533	-0.398	-0.255	-0.563	1.369	0.122
	(-1.60)	(-1.43)	(-1.62)	(-0.33)	(-0.18)	(-0.40)	(0.85)	(0.07)
N	*48*	*48*	*48*	*48*	*48*	*48*	*48*	*48*
Multi-proposals per meeting	-1.299***	-0.432*	-0.542**	-2.500***	-2.149***	-3.907***	-0.862	-1.390
	(-3.76)	(-1.67)	(-2.08)	(-4.70)	(-3.97)	(-6.88)	(-1.26)	(-1.64)
N	*396*	*396*	*396*	*396*	*396*	*396*	*396*	*396*
Defeated proposals	-2.445***	-1.260***	-1.028***	-3.510***	-4.031***	-5.730***	-3.914***	-5.146***
	(-6.05)	(-4.26)	(-3.16)	(-5.47)	(-6.54)	(-8.47)	(-5.22)	(-6.34)
N	*260*	*260*	*260*	*260*	*260*	*260*	*260*	*260*
Passed proposals	0.614	0.306	0.0250	1.492	1.719	0.661	4.411***	8.022***
	(1.18)	(0.82)	(0.04)	(1.66)	(1.56)	(0.61)	(3.34)	(3.90)
N	*83*	*83*	*83*	*83*	*83*	*83*	*83*	*83*
Withdrawn proposals	-0.129	1.143	-0.335	-4.342**	-0.822	-2.263	-2.728	-2.957
	(-0.12)	(1.61)	(-0.32)	(-2.66)	(-0.41)	(-1.15)	(-1.23)	(-1.03)
N	*45*	*45*	*45*	*45*	*45*	*45*	*45*	*45*
CG proposals	-1.483***	-0.602**	-0.626**	-2.640***	-2.237***	-4.002***	-0.961	-1.459*
	(-4.12)	(-2.22)	(-2.30)	(-4.78)	(-4.01)	(-6.80)	(-1.36)	(-1.69)
N	*385*	*385*	*385*	*385*	*385*	*385*	*385*	*385*
CSR proposals	0.0238	0.0607	-0.445	0.638	0.474	0.467	0.445	0.710
	(0.05)	(0.15)	(-0.88)	(1.20)	(0.82)	(0.74)	(0.53)	(0.53)
N	*33*	*33*	*33*	*33*	*33*	*33*	*33*	*33*
EGM	-1.428***	-0.393	-0.802	-3.336***	-4.215***	-5.470***	-3.704***	-4.369***
	(-2.74)	(-1.10)	(-1.58)	(-4.63)	(-4.93)	(-6.11)	(-3.63)	(-3.60)
N	*175*	*175*	*175*	*175*	*175*	*175*	*175*	*175*

Table 4. Cumulative abnormal returns by quintiles of long-term institutional ownership

This table shows the mean cumulative abnormal returns around general meeting date by quintiles of long-term institutional ownership. The Market model based on a 200-day period ending 21 days prior to the general meeting date has been used to calculate CAR. The FTSE All Share index has been used for benchmarking. The cross-sectional t-test has been used to test the significance of mean differences. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

Long-term IO	***CAR***							
	[-1,+1]	**[-1,0]**	**[0,+1]**	**[-2,+2]**	**[-1,+5]**	**[-1,+7]**	**[-5,+5]**	**[-10,+10]**
1st Quintile	-0.854	-1.137*	0.437	-1.284	-3.744***	-4.230***	-3.629***	-3.090*
	(-1.18)	(-1.83)	(1.03)	(-1.05)	(-3.57)	(-3.97)	(-2.95)	(-1.97)
N	*87*	*87*	*87*	*87*	*87*	*87*	*87*	*87*
2nd Quintile	-0.833	0.266	0.165	-3.965***	-1.669	-3.974***	-1.468*	-6.857***
	(-1.59)	(0.56)	(0.38)	(-4.78)	(-1.47)	(-3.14)	(-1.67)	(-5.96)
N	*81*	*81*	*81*	*81*	*81*	*81*	*81*	*81*
3rd Quintile	-1.624*	-1.437**	-0.848	-2.856*	1.150	-2.567*	8.879***	3.366
	(-1.89)	(-2.20)	(-1.21)	(-1.74)	(0.76)	(-1.99)	(5.84)	(1.41)
N	*89*	*89*	*89*	*89*	*89*	*89*	*89*	*89*
4th Quintile	-4.034***	-0.583	-3.485***	-4.341***	-6.524***	-8.481***	-8.773***	-4.036**
	(-5.00)	(-1.25)	(-4.88)	(-4.50)	(-6.27)	(-6.51)	(-6.26)	(-2.60)
N	*94*	*94*	*94*	*94*	*94*	*94*	*94*	*94*
5th Quintile	1.255***	0.619	0.901***	0.997**	1.268**	1.637**	2.300*	4.190***
	(3.24)	(1.43)	(3.66)	(2.52)	(2.23)	(2.38)	(1.91)	(2.68)
N	*89*	*89*	*89*	*89*	*89*	*89*	*89*	*89*

5. Estimation Results

5.1 Investor horizon and shareholder proposals targeting

I will now explore the relationship between long-term institutional ownership and the probability of a firm being targeted by shareholder proposals. *Table 5* shows that, while institutional ownership decreases the likelihood of a firm being targeted by shareholder proposals, this effect is driven mainly by institutional shareholders with a long investment horizon. While the coefficient estimate of long-term institutional ownership is negative and significant in all models, the coefficient estimates of ownership of institutional investors with a shorter investment horizon (i.e. medium-term and short-term) are not only less statistically significant, but also positive in some models. To ensure my results are not driven by the proxy I used for size in my matching procedure, in Columns (1)–(8), I use four different proxies for size, and the results remain consistent. In Columns (9) and (10), I also run my regression model, including all matched-peer firms with all four size proxies, and the results remain unchanged. In terms of economic significance, column (10) of *Table 5* suggests that when all control variables at their mean values, an increase in long-term institutional ownership from the first quartile (median) to the third quartile is associated with a 11.3% (4.35%) decrease in the probability of a firm being targeted by shareholder proposals. Overall, the results in *Table 5* support my first hypothesis *H1*.

My findings are consistent with the trend found in some studies that show a negative relationship between institutional ownership and the likelihood of shareholder proposals targeting (Johnson and Shackell, 1997; Ertimur, Ferri and Muslu, 2011; Renneboog and Szilagyi, 2011). However, I find that this negative relationship is mainly driven by long-term institutional ownership. Similar to the literature, I find that CEO ownership decreases the likelihood of shareholder proposals targeting (Cziraki, Renneboog and Szilagyi, 2010; Renneboog and Szilagyi, 2011), but I find modest evidence that this relationship is quadratic. As it is well documented in prior studies that large firms and firms with poor stock and operating performance are more likely to be targeted by shareholder proposals, *Table 5* also shows that stock return and return on asset (total asset) decrease (increase) the probability of targeting. I also find that the increase in board size, board diversity (i.e. females on the board), and CEO tenure decrease the likelihood of shareholder proposals targeting, which is consistent with the idea that firms with better governance practices are less likely to be targeted. Overall,

the results documented in *Table 5* support my prediction in *H1* and are consistent with prior studies.

Table 5. Target analysis and investor horizon

This table presents the results of logistic regressions examining the effect of the investment horizon of institutional investors on the probability of a firm being targeted by shareholder proposals. The dependent variable target firm is a dummy variable that equals 1 if firms are being targeted by at least one shareholder proposal at a given year, 0 for matched (non-target) firms. Columns (1) - (8) show the results using different proxies for size in our matching procedure: Market-to-book (MTB), total assets, revenue, and market capitalization. Columns (9) and (10) replicate the estimation when pooling all matched firms with the four different size proxies in one regression. Detailed definitions of the remaining variables are reported in Appendix C Table C1. Standard errors are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

	Dependent variable = Target Firm									
	MTB		Total Assets		Revenue		Market Cap.		All Matched	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Institutional Ownership	-2.185**		-2.085**		-2.038*		-2.711***		-1.920**	
	[1.004]		[0.935]		[1.088]		[1.029]		[0.926]	
Long-term IO		-1.986**		-2.407**		-2.514**		-2.649**		-2.047**
		[1.011]		[1.032]		[1.177]		[1.086]		[0.957]
Medium-term IO		-3.415		-4.908***		0.283		-3.714*		-1.906
		[2.216]		[1.807]		[2.272]		[1.987]		[1.633]
Short-term IO		-2.276		4.104		-0.697		-0.955		-0.337
		[2.779]		[2.881]		[2.884]		[3.089]		[2.311]
Blockholding (5%)	1.037	1.015	-0.508	-0.460	-0.704	-0.697	0.045	0.058	-0.195	-0.206
	[1.085]	[1.086]	[0.987]	[0.991]	[1.109]	[1.112]	[1.012]	[1.018]	[0.787]	[0.786]
Board Size	-0.548	-0.524	-0.369	-0.443	-0.472	-0.521	-0.854*	-0.862*	-0.572*	-0.615*
	[0.403]	[0.418]	[0.382]	[0.400]	[0.339]	[0.354]	[0.450]	[0.452]	[0.298]	[0.317]
Board Size^2	0.038	0.037	0.034	0.039	0.029	0.032	0.059**	0.059**	0.040**	0.042**
	[0.024]	[0.025]	[0.023]	[0.024]	[0.019]	[0.020]	[0.028]	[0.028]	[0.017]	[0.018]
Non-executive Ratio	-0.527	-0.496	0.532	0.706	-0.479	-0.649	2.348	2.403	0.323	0.370
	[1.655]	[1.652]	[1.700]	[1.866]	[1.757]	[1.802]	[1.862]	[1.924]	[1.499]	[1.521]
Average Age Non-executive	0.058	0.056	0.029	0.027	0.076*	0.083*	0.008	0.007	0.044	0.045
	[0.048]	[0.049]	[0.043]	[0.045]	[0.046]	[0.047]	[0.047]	[0.047]	[0.037]	[0.037]
Board Female Ratio	-1.183	-1.309	-4.236**	-4.030*	-5.221**	-4.845**	-3.377*	-3.356	-2.489	-2.328
	[2.271]	[2.287]	[2.089]	[2.152]	[2.442]	[2.462]	[2.014]	[2.072]	[1.896]	[1.920]
CEO Duality	0.601	0.598	1.402	1.421	1.417	1.432	1.032	1.039	0.732	0.745
	[0.781]	[0.803]	[0.859]	[0.918]	[1.148]	[1.115]	[0.737]	[0.735]	[0.709]	[0.719]
CEO Tenure	-0.085**	-0.087**	-0.077	-0.083*	-0.105*	-0.106*	-0.102*	-0.101*	-0.083	-0.082
	[0.043]	[0.044]	[0.048]	[0.049]	[0.059]	[0.060]	[0.053]	[0.053]	[0.052]	[0.053]

CEO Ownership	-1.646	-2.042	-3.383	-3.794	46.074	44.446	-11.227*	-11.055*	-3.981	-3.943
	[11.597]	[11.766]	[17.002]	[16.953]	[29.407]	[28.205]	[6.270]	[6.259]	[5.156]	[5.193]
CEO Ownership^2	0.168	0.194	0.288	0.306	-3.003	-2.890	0.794*	0.781*	0.321	0.316
	[0.775]	[0.787]	[1.138]	[1.133]	[1.961]	[1.882]	[0.420]	[0.419]	[0.348]	[0.350]
Share Return	0.181	0.166	-0.457	-0.395	-0.197	-0.173	-0.456*	-0.433*	-0.273	-0.257
	[0.270]	[0.273]	[0.284]	[0.291]	[0.196]	[0.192]	[0.249]	[0.240]	[0.219]	[0.211]
Share Turnover	-0.368	-0.378	-0.276	-0.287	-0.299	-0.324	0.111	0.089	-0.219	-0.228
	[0.246]	[0.245]	[0.180]	[0.193]	[0.250]	[0.257]	[0.326]	[0.330]	[0.203]	[0.207]
Total Assets	0.383**	0.372**	0.199	0.203	0.471**	0.494**	0.236	0.234	0.287**	0.294**
	[0.153]	[0.153]	[0.137]	[0.140]	[0.196]	[0.197]	[0.155]	[0.155]	[0.120]	[0.123]
Leverage	-0.081	-0.108	-1.547	-1.665	-0.575	-0.390	-2.274*	-2.214*	-1.330	-1.230
	[1.597]	[1.601]	[1.252]	[1.289]	[1.449]	[1.483]	[1.283]	[1.276]	[1.052]	[1.046]
ROA	-3.084***	-3.219***	-1.624*	-1.576	-0.862	-0.332	-0.735	-0.775	-1.320*	-1.223*
	[1.190]	[1.196]	[0.938]	[1.028]	[1.000]	[1.001]	[0.882]	[0.909]	[0.724]	[0.725]
R&D	4.092	4.031	3.582	2.372	0.012	-0.033	0.840	0.600	1.429	1.466
	[5.734]	[6.083]	[5.517]	[5.331]	[5.099]	[4.620]	[5.752]	[5.804]	[4.679]	[4.673]
Capital Expenditure	1.094	1.373	-5.097	-5.333	-10.292**	-10.720**	-6.651*	-6.415*	-5.699	-5.662
	[3.786]	[3.772]	[3.435]	[3.628]	[4.889]	[5.241]	[3.702]	[3.728]	[4.130]	[4.166]
Pseudo R^2	0.23	0.24	0.23	0.24	0.25	0.26	0.26	0.26	0.20	0.20
N	190	190	198	198	200	200	200	200	497	497

5.1 Investor horizon and market reaction

I next focus on the relationship between long-term institutional ownership and the outcome of shareholder proposals. I conduct my outcome analysis using two levels of outcome. I start with the first level which I call market reaction outcome. *Table 6* presents the results for the market reaction analysis to test my second hypothesis *H2*. I use CAR with eight different event windows to examine the market reaction around shareholder proposal meetings. These windows range from a two trading days window, [0,+1], to one trading month, [-10,+10]. In *Table 6*, I present all eight event windows of CAR.

Table 6 shows that long-term institutional ownership increases the CARs around shareholder meeting dates. This result can be interpreted as meaning that firms with a higher presence of long-term institutional investors will experience a positive market reaction to shareholder proposals. Seven out of the eight event windows of CAR show statistically significant results. In terms of economic significance, results from *Table 6* suggest that an increase in long-term institutional ownership from the first quartile (median) to the third quartile is associated with an 8.26% (3.73%) increase in CAR [-1,+1] and with an 21.2% (9.62%) increase in CAR [-10,+10].

Indeed, prior studies document mixed results on the effect of institutional ownership on market reaction. While some studies find no statistically significant relationship between institutional ownership and CAR (Borokhovich et al., 2006; Cziraki, Renneboog and Szilagyi, 2010; Renneboog and Szilagyi, 2011), others find some evidence for a positive relationship (Gillan and Starks, 2000; Cuñat, Gine and Guadalupe, 2012). Interestingly, Thomas and Cotter (2007) find a significant negative relationship as well. Thus, my findings might contribute to this contradictory picture by documenting how the investment horizon is an important determinant of institutional investors' reaction to shareholder proposal submissions. This result is also in line with the fact that well-monitored firms tend to experience a positive market reaction to shareholder proposals.

The results of control variables in *Table 6* are generally consistent with the literature. For example, I find CEO ownership decreases CAR, similar to Renneboog and Szilagyi (2011), and to other studies that use total insider ownership as a control instead (Borokhovich et al., 2006; Thomas and Cotter, 2007). Moreover, I find supporting evidence for the effect of the voting outcome of shareholder proposals on the market reaction to these proposals (Gillan and

Starks, 2000; Renneboog and Szilagyi, 2011). I find that, while there is modest evidence—although, only for short event windows—on the positive relationship between passed proposals and CAR, defeated proposals are associated with consistent negative market reaction across most event windows of CAR.

Table 6. Cumulative abnormal returns and investor horizon

This table presents the results of OLS regressions examining the effect of long-term institutional ownership on the cumulative abnormal returns. Eight different event windows are used to calculate CAR. The Market model based on a 200-day period ending 21 days prior to the general meeting date has been used to calculate CAR. The FTSE All Share index has been used for benchmarking. Detailed definitions of the remaining variables are reported in Appendix C Table C1. Standard errors are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

	Dependent variable = Cumulative abnormal returns							
	[-1,+1]	[-1,0]	[0,+1]	[-2,+2]	[-1,+5]	[-1,+7]	[-5,+5]	[-10,+10]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Long-term IO	17.757***	7.872**	10.999**	15.586	20.945***	22.994***	24.250**	45.763***
	[5.332]	[3.345]	[4.261]	[10.083]	[7.862]	[8.565]	[9.987]	[10.935]
Institutional Ownership	-9.502*	-3.185	-7.965*	-4.329	-13.649*	-14.295	-14.026	-20.797**
	[4.938]	[2.615]	[4.102]	[9.751]	[7.875]	[8.698]	[9.265]	[9.054]
Blockholding (5%)	-6.386*	1.466	-5.960*	-2.462	-2.840	-5.558	-3.566	-8.628
	[3.480]	[2.528]	[3.456]	[5.882]	[6.044]	[6.826]	[6.952]	[7.765]
Board Size	0.676	2.347*	-0.752	2.317	-1.743	-1.936	-3.024	-2.995
	[1.063]	[1.202]	[0.959]	[1.678]	[1.797]	[1.605]	[2.536]	[2.536]
Board Size^2	-0.040	-0.100*	0.022	-0.098	0.054	0.079	0.129	0.236
	[0.060]	[0.060]	[0.053]	[0.088]	[0.088]	[0.088]	[0.132]	[0.152]
Non-executive Ratio	0.206	-1.664	3.832	4.665	-1.654	-2.404	-5.371	6.423
	[5.278]	[5.080]	[5.249]	[6.201]	[8.631]	[9.833]	[9.954]	[11.941]
Average Age Non-executive	-0.041	-0.034	-0.171*	-0.119	-0.258	-0.134	0.166	-0.237
	[0.124]	[0.124]	[0.102]	[0.157]	[0.195]	[0.200]	[0.205]	[0.255]
Board Female Ratio	4.676	-1.264	-1.264	24.870*	-12.047	-1.246	-4.411	-21.645
	[8.564]	[7.784]	[7.023]	[13.406]	[12.310]	[14.599]	[18.050]	[27.937]
CEO Duality	-1.086	-4.666**	1.271	-6.120*	-2.788	-4.146	0.630	-3.393
	[2.213]	[1.791]	[2.427]	[3.572]	[3.679]	[4.724]	[4.680]	[7.681]
CEO Tenure	0.109	0.178	0.143	0.107	0.260	-0.007	-0.328	-0.681
	[0.196]	[0.186]	[0.181]	[0.290]	[0.407]	[0.410]	[0.436]	[0.443]
CEO Ownership	-35.990	-2.768	-215.571	-291.387*	-525.677***	-359.100**	160.154	85.155
	[84.397]	[39.648]	[158.421]	[153.160]	[134.603]	[160.042]	[318.653]	[167.009]
CEO Ownership^2	2.383	0.160	14.369	19.423*	35.069***	23.940**	-10.610	-5.698

	[5.624]	[2.637]	[10.561]	[10.209]	[8.970]	[10.666]	[21.241]	[11.121]
Share Return	-0.864	-0.382	-0.746	-0.689	0.141	0.487	2.347	-5.191
	[1.490]	[1.417]	[1.362]	[2.178]	[2.130]	[2.333]	[2.771]	[3.214]
Share Turnover	1.052*	0.581	0.885	0.370	-1.988	-1.029	-2.419	-0.803
	[0.626]	[0.515]	[0.602]	[1.288]	[1.341]	[1.392]	[1.552]	[1.588]
Total Assets	-1.116*	-0.655*	-0.468	-2.229**	0.373	-0.129	-0.305	-2.516**
	[0.613]	[0.375]	[0.558]	[0.935]	[0.935]	[0.989]	[1.187]	[1.218]
Leverage	-6.180	-3.075	-5.949	-6.739	-15.023*	-17.933*	-4.113	-18.577
	[4.743]	[4.275]	[4.403]	[7.769]	[8.443]	[9.088]	[8.828]	[11.228]
ROA	0.123	-1.926	-0.451	6.461*	8.868**	13.533***	14.458***	14.753**
	[1.963]	[1.970]	[2.097]	[3.458]	[3.597]	[4.042]	[5.373]	[7.353]
R&D	-6.821	-7.851	10.285	-11.338	1.609	-7.758	-22.292	-34.414
	[10.369]	[10.239]	[11.251]	[25.145]	[19.746]	[21.690]	[28.027]	[37.030]
Capital Expenditure	-0.324	0.521	-0.817	26.498	12.283	16.717	11.921	17.429
	[9.313]	[6.669]	[11.597]	[16.382]	[14.170]	[18.213]	[21.436]	[28.528]
CG Proposal	-3.940*	-2.647*	0.017	-3.481	-2.651	-3.381	-10.848**	-5.143
	[2.058]	[1.397]	[1.780]	[2.508]	[2.937]	[3.353]	[4.501]	[3.724]
CSR Proposal	-2.119	-2.381	-0.117	-2.876	-2.040	-0.240	-5.240	0.783
	[1.970]	[1.663]	[1.720]	[2.814]	[3.022]	[3.791]	[3.999]	[4.814]
Passed	0.244	0.113	0.800	7.536**	-2.682	-2.289	-7.428	1.489
	[1.679]	[1.313]	[1.828]	[3.511]	[3.499]	[4.020]	[4.924]	[6.311]
Defeated	-4.068**	-4.575***	0.220	0.252	-6.266*	-8.023*	-13.065***	-13.171*
	[1.555]	[1.557]	[1.925]	[2.462]	[3.219]	[4.051]	[4.702]	[7.001]
EGM	-2.482	-0.309	-2.804	-2.908	-1.950	-0.244	-0.070	-1.677
	[1.909]	[1.508]	[1.762]	[3.268]	[3.217]	[3.396]	[4.050]	[5.045]
R^2	0.41	0.43	0.23	0.37	0.46	0.46	0.43	0.41
N	296	296	296	296	296	296	296	296

Similar to Borokhovich et al. (2006), I find that a firm's operating performance is positively associated with market reaction, although they document positive, but not statistically significant, coefficients. Finally, the results in *Table 6* are also supporting the argument that the general meeting date is an appropriate event date to study market reaction to shareholder proposals. Overall, the results documented in *Table 6* support my prediction in *H2* and are consistent with the literature.

5.1 Investor horizon and voting outcome

To test my third hypothesis *H3*, I use several proxies for the voting outcome of shareholder proposals. *Table 7* presents the results for all three proxies. *Table 7* shows that long-term institutional ownership decreases the probability of a shareholder proposal being defeated, increases the probability of a shareholder proposal being passed, and decreases the level of dissent on shareholder proposals. In terms of economic significance, column (1) of *Table 7* suggests that an increase in long-term institutional ownership from the first quartile (median) to the third quartile is associated with a 51.3% (42%) decrease in the probability of a shareholder proposal being defeated. These results are consistent with the majority of studies in the literature that document a positive association between institutional ownership and the positive voting outcome (i.e. voting in favour to the shareholder proposal) (Gordon and Pound, 1993; Strickland, Wiles and Zenner, 1996; Gillan and Starks, 2000; Thomas and Cotter, 2007; Ertimur, Ferri and Stubben, 2010; Renneboog and Szilagyi, 2011). However, some coefficients were not statistically significant.

Nevertheless, my findings reveal that this positive relationship is mainly driven by institutional investors with a long-term horizon. Indeed, this result is consistent with the findings by Gine, Moussawi and Sedunov (2017) who differentiate between different classes of institutional investors (i.e. bank ownership, investment advisor ownership, insurance company ownership, etc.). They find that a positive relationship between institutional ownership and positive voting on shareholder proposals is more pronounced in the case of public pension fund ownership, which is characterized by a long-term investment horizon. However, their study focuses only on shareholder proposals on poison pills.

Table 7. Voting outcome and investor horizon

This table presents the results of logistic and OLS regressions examining the effect of long-term institutional ownership on the voting outcome of shareholder proposals. Columns (1) and (2) shows the logistics estimations and Column (3) shows the OLS estimations. Defeated (Passed) is a dummy variable that equals 1 if the shareholder proposal is put to vote and does not (does) exceed the majority voting requirement, zero otherwise. Dissent is the logistic transformation of the ratio of against and abstain votes to the total votes cast. Detailed definitions of the remaining variables are reported in Appendix C Table C1. Standard errors are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

Dependent variable =	*Defeated*	*Passed*	*Dissent*
	(1)	(2)	(3)
Long-term IO	-7.146**	15.115***	-2.342*
	[3.213]	[4.055]	[1.266]
Institutional Ownership	4.729*	-13.383***	1.317
	[2.540]	[4.085]	[1.294]
Blockholding (5%)	3.116**	-4.968**	0.617
	[1.472]	[2.040]	[0.654]
Board Size	-0.053	-0.971	0.543***
	[0.679]	[0.971]	[0.176]
Board Size^2	0.065	0.003	-0.018**
	[0.046]	[0.053]	[0.008]
Non-executive Ratio	-4.331	3.930	1.865
	[3.839]	[3.471]	[1.146]
Average Age Non-executive	-0.004	-0.011	-0.032
	[0.072]	[0.050]	[0.024]
Board Female Ratio	1.477	-7.344	-3.576*
	[5.041]	[8.814]	[2.034]
CEO Duality	-0.069	0.639	-0.909
	[1.212]	[1.823]	[0.643]
CEO Tenure	-0.182*	0.025	0.098*
	[0.095]	[0.116]	[0.055]
CEO Ownership	-13.993	74.584*	-49.861**
	[27.906]	[41.984]	[21.685]
CEO Ownership^2	0.940	-4.962*	3.330**
	[1.860]	[2.798]	[1.445]
Share Return	1.622**	-1.092	0.590**
	[0.780]	[0.899]	[0.224]
Share Turnover	-0.192	0.268	-0.188
	[0.453]	[0.420]	[0.157]
Total Assets	-0.647*	0.616*	-0.161
	[0.361]	[0.341]	[0.118]
Leverage	6.197	-4.520	0.962
	[3.917]	[3.299]	[1.250]
ROA	2.530*	0.142	3.544***
	[1.413]	[1.545]	[0.500]
R&D	-0.474	10.265*	7.066**

	[9.889]	[6.184]	[3.041]
Capital Expenditure	-8.530	2.760	5.071**
	[5.252]	[6.061]	[2.273]
CG Proposal	-1.474	1.226	-0.324
	[1.326]	[1.509]	[0.428]
CSR Proposal	0.136	1.102	-0.771
	[1.558]	[1.193]	[0.782]
EGM	1.393	-1.112	-0.819***
	[0.910]	[1.053]	[0.282]
R^2 (Pseudo)	(0.38)	(0.40)	0.46
N	322	322	222

Table 7 also shows that an increase in a firm's stock return and/or operating performance is associated with a lower level of positive voting on shareholder proposals, with similar results documented in the literature (Gordon and Pound, 1993; Strickland, Wiles and Zenner, 1996; Thomas and Cotter, 2007; Ertimur, Ferri and Stubben, 2010; Renneboog and Szilagyi, 2011). I also find that dissent voting on shareholder proposals increases with board size, CEO tenure, CEO ownership concentration, capital expenditure, and R&D, but decreases when a firm's board has more female directors, when CEO ownership increases, and in EGMs. Cziraki, Renneboog and Szilagyi (2010) and Renneboog and Szilagyi (2011) also control for board size and CEO ownership, and my results are similar to theirs. Overall, the results documented in *Table 7* support my prediction in *H3* and are consistent with prior findings.

5.1 Additional robustness[16]

To check the robustness of my results, I conduct several additional tests. First, in *Table 8*, I use alternative proxies for the voting outcome of shareholder proposals. Following Ertimur, Ferri and Muslu (2011) and Stathopoulos and Voulgaris (2016), I use a dummy variable to indicate if dissent or for voting on a shareholder proposal exceeds a threshold. I use the median of dissent and for voting of all shareholder proposals in the sample as my threshold. Thus, I use a *Dissent (high)/ For (high)* dummy variable which equals 1 if dissent voting/for voting on a shareholder proposal is larger than the sample median dissent voting/for voting, and zero otherwise. Further, I also use a dummy variable, *Passed & Withdrawn*, which is similar to my *Passed* variable used in *Table 7*, but includes shareholder proposals that have been withdrawn

[16] The results of this section are presented in Appendix C.

before the general meeting date. Bauer, Moers and Viehs (2015) argue and find that withdrawn proposals are an effective governance device for change, as managers discuss and try to settle the proposed matter with the proposal's sponsor in order to prevent the proposals being put on vote during the general meeting. I also use an alternative measure of a *Dissent* variable by excluding abstain votes and only considering against votes, as abstain votes do not necessarily mean that abstaining shareholders oppose the proposed matter (Stathopoulos and Voulgaris, 2016). Finally, I use the percentage of for (in favour) votes to the total votes cast as a voting outcome of shareholder proposals, following many studies in the shareholder proposal literature (Gordon and Pound, 1993; Gillan and Starks, 2000; Thomas and Cotter, 2007). Overall, the results documented in *Table 8* are consistent with *Table 7*'s results and support my prediction in *H3* that long-term institutional ownership is associated with higher (lower) positive (dissent) voting on shareholder proposals.

Second, I conduct propensity score matching (PSM) analysis to mitigate the selection bias when matching treated firms with control firms, following prior studies (Bauer, Moers and Viehs, 2015; Marquardt and Wiedman, 2016; Alkalbani, Cuomo and Mallin, 2019). In *Table 9a*, I employ PSM to match firms targeted by shareholder proposals (treated group) with firms with similar observable firm characteristics (control group). I use all the firm-level independent variables in Equation (1), except ownership variables. The outcome variable is long-term institutional ownership. Using five different matching algorithms, *Table 9a* shows that target firms have significantly lower long-term institutional ownership than control group firms by about 10%. These results are consistent with the results reported in *Table 5* and in line with my hypothesis *H1*.

Next, I also use PSM to match target firms with a high proportion of long-term institutional ownership (treated group) with other target firms with a low proportion (control group), and the outcome variables are CARs, in *Table 9b*, and different proxies for voting, in *Table 9c*. I use all the firm-level independent variables in Equations (2) and (3), respectively, except ownership variables. *Table 9b* shows that CARs around shareholder proposals meetings are significantly higher in targeted firms with a high presence of institutional investors than firms with a low presence. *Table 9c* shows that the positive (dissent) voting of shareholder proposals is higher (lower) in firms with higher long-term institutional ownership. Overall, these results are in line with results reported in *Table 6* and *Table 7* and support my predictions in *H2* and *H3*, respectively.

Third, I differentiate between long-term institutional investors based on investment strategy at firm level (index versus non-index) (Harford, Kecskés and Mansi, 2018) and at portfolio level (high portfolio turnover versus low portfolio turnover) (Yan and Zhang, 2009). Non-index and low portfolio turnover long-term institutional shareholders are expected to be better informed and efficient monitors (Bushee, 1998). *Tables 10a* and *10b* replicate *Tables 6* and *7*, respectively, but divide long-term institutional investors into indexer versus non-indexer and high-turnover versus low-turnover investors.

On the one hand, Panels A of *Tables 10a* and *10b* show, as expected, that the previously reported results on the effect of long-term institutional ownership on market reaction and voting outcome are mainly driven by non-indexer institutional investors rather than indexer institutions.

On the other hand, Panel B of *Table 10a* interestingly shows that, while the high presence of long-term institutional investors with high turnover at their portfolio level is associated with higher CARs, this relationship is not statistically significant for investors with a low-turnover portfolio. However, Panel B of *Table 10b* shows that an increase in the presence of long-term institutional investors with a low-turnover portfolio is significantly associated with an increase (decrease) in positive (dissent) voting on shareholder proposals, while investors with a high-turnover portfolio seem to have less influence on the voting outcome.

Fourth, Brickley, Lease and Smith (1988, p. 277) divide institutional investors based on their 'susceptibility to management pressure' into institutions with high potential influence—pressure-sensitive (i.e. banks, insurance companies and trusts)—and institutions with low potential influence—pressure-resistant (i.e. mutual funds and public pension funds). They argue and find that pressure-resistant institutions are more likely to oppose management by voting against management anti-takeover proposals. Many studies later adopt such classifications and confirm the active monitoring role of pressure-resistant institutional investors (Almazan, Hartzell and Starks, 2005; Chen, Harford and Li, 2007; Ferreira and Matos, 2008).

Recently, scholars have adopted the pressure-sensitive versus pressure-resistant argument to investigate the effect of institutional ownership on shareholder proposals' probability and outcome. Borokhovich et al. (2006) argue that, unlike pressure-sensitive blockholders, pressure-resistant blockholders are viewed as effective monitors by the market,

and they find supporting evidence that firms with the presence of pressure-resistant blockholders experience a positive market reaction to shareholder proposal submission. Additionally, Renneboog and Szilagyi (2011) find that pressure-resistant institutional ownership is negatively associated with the probability of shareholder proposals targeting, but this is positively related to CAR around the announcement of shareholder proposal submissions and voting in favour of these proposals. In contrast, Cziraki, Renneboog and Szilagyi (2010) find that both pressure-sensitive and pressure-resistant institutional ownership increases the probability of shareholder proposals targeting. However, the results are stronger for the latter, and they interestingly find that both variables are not significantly related to CAR nor the voting outcome of shareholder proposals.

In *Tables 11a*, *11b*, and *11c*, I not only differentiate between pressure-sensitive and pressure-resistant institutional investors, but I also further divide them based on their investment horizon, following Chen, Harford and Li (2007). It can be observed that *Table 11a* confirms the established argument by previous studies on the effective monitoring role of pressure-resistant institutions and shows consistent results with Renneboog and Szilagyi (2011). That is, both pressure-sensitive and pressure-resistant institutional ownership is negatively associated with the probability of shareholder proposals targeting, although it is only statistically significant for the latter.

When I further differentiate institutional investors based on investor horizon, it seems that the negative association is mainly driven by long-term institutional investors. Furthermore, *Tables 11b* and *11c* focus on the market reaction and voting outcome and show that, while total pressure-resistant institutional ownership is neither statistically related to market reaction nor voting outcome, the coefficient estimates of the long-term proportion are statistically significant. The estimates suggest that firms with a high presence of pressure-resistant institutional investors with long-term horizon experience positive market reaction to shareholder proposals and positive voting on these proposals. It is worth mentioning that all the coefficient estimates of long-term pressure-resistant institutional ownership, reported in *Tables 11a*, *11b*, and *11c*, are larger than the total long-term institutional ownership's coefficients, as reported in *Tables 5*, *6*, and *7*, respectively.

Finally, I differentiate long-term institutional investors based on their domiciled country. Previous studies show that domestic institutional investors have information advantage about local firms compared with foreign institutional investors [see for example

Ferreira et al. (2017)], as the latter seem to suffer from asymmetric information (Phung and Le, 2013). Additionally, previous studies argue that domestic institutional investors are more likely to have business ties and better networks with their local investee firms (Gillan and Starks, 2003; Ferreira and Matos, 2008; Bena et al., 2017). Kim et al. (2016) study a sample of listed firms from 29 countries to investigate the monitoring effectiveness of institutional investors in mitigating earning management. In particular, they find that domestic institutional investors are better able to constrain earning management due to the proximity of monitoring information as compared to their foreign counterparts. However, they find the monitoring effectiveness of foreign institutional investors improves as they become more familiar with the accounting practices and culture of the host country, especially if these investors are from countries with strong shareholder protection and the investee firms are in countries with weak shareholder protection. Chhaochharia, Kumer and Niessen-Ruenzi (2012) document similar results that firms with high local institutional ownership are less likely to engage in earning management practices, and these firms have better internal governance and are more profitable.

In the context of the UK, Hendry et al., 2007 interview UK institutional investors and document that the mainstream of domestic institutional investors in the UK actively engage and communicate with their investee firms, and they consider their activism as original part of their stewardship towards their agents. Thus, I expect the effect of long-term institutional investors on the probability of shareholder proposals targeting and the outcome of shareholder proposals will be more pronounced for domestic ownership.

In *Tables 12a*, *12b*, and *12c*, I differentiate between foreign and domestic institutional investors based on their investment horizon. *Table 12a* shows that foreign institutional investors with short-term investment horizon increases the targeting probability. On the other hand, the findings show that domestic institutional ownership is negatively associated with the probability of shareholder proposals targeting, but the results are driven by long-term domestic institutional investors. Furthermore, *Tables 12b* and *12c* focus on the market reaction and voting outcome. While both foreign and domestic institutional ownership are neither statistically related to market reaction nor voting outcome, the long-term institutional ownership coefficient estimates are statistically significant with more consistent results for domestic institutional investors. Overall, my results support the aforementioned literature on the heterogeneity between domestic and foreign institutional investors, but I further show that

foreign and domestic investment horizon plays an important but different role in their activism behaviour using the shareholder proposals channel.

6. Conclusion

This study investigates the role of investor horizon on the targeting probability and outcomes of shareholder proposals. In particular, I study the effect of long-term institutional ownership on the probability of shareholder proposals targeting, market reaction around shareholder proposal meetings, and voting outcome of shareholder proposals. Building on the agency view and monitoring role of institutional investors, I expect that the presence of institutional investors with a long-term investment horizon is associated with a lower probability of shareholder proposals targeting and a better outcome of shareholder proposals. This study focuses on shareholder proposals that have been submitted to publicly listed UK firms for the period 1998–2016. The UK provides an interesting context to study shareholder proposals. Not only are the UK's legal and institutional frameworks thriving to empower investors and protect minority investors, but also the proxy rules and the practical implementation of shareholder proposals are distinctive from other contexts such as in the US.

I find that firms with a higher proportion of long-term institutional ownership are less likely to be targeted by shareholder proposals. Further, I focus on the influence of long-term institutional ownership on the outcomes of shareholder proposals. For the market reaction to shareholder proposals, my findings show that an increase in the presence of long-term institutional investors is associated with higher CARs around shareholder proposal meetings. Moreover, my analysis on the voting outcome of shareholder proposals reveals that shareholder proposals submitted to firms with a higher proportion of long-term institutional ownership receive lower dissent voting and are more (less) likely to be passed (defeated). In further analysis, I confirm the heterogeneity previously documented by earlier studies in the effect of pressure-sensitive and pressure-resistant institutional ownership on shareholder proposals' targeting and outcome. However, my findings suggest that the negative relationship between pressure-resistant ownership and the probability of shareholder proposals' targeting, and the positive relationship with market reaction and in favour voting, only exist for pressure-resistant institutional investors with a long-term horizon. I also employ PSM analysis and use several proxies for voting outcome, and my findings are unchanged. Overall, my findings support my predictions.

This study contains several potential limitations that could provide avenues for future research. First, owing to data unavailability, I did not consider the potential effect of the sponsor identity on the outcomes of shareholder proposals that are documented within some US-based studies. Besides controlling for its potential effect in the outcome models, it would be interesting to investigate how the sponsor identity of shareholder proposals would moderate the relationship between institutional ownership and market reaction and voting outcome. Bauer, Moers and Viehs (2016) show that institutional ownership increases the probability of a shareholder proposal being withdrawn if it is sponsored by institutions.

Second, this study, similar to most prior research investigating public shareholder activism (i.e. shareholder proposals and campaigns), considers 'visible activism', which implicitly overrides the role of private shareholder activism (i.e. behind-the-scenes negotiations) (Goranova et al., 2017). McCahery, Sautaner and Starks (2016) document that long-term institutional investors more intensively intervene with their investee firm behind the scenes. I further find comparatively supporting evidence that shareholder proposals are more likely to be withdrawn before they put on vote in firms with a higher presence of long-term institutional investors. As mentioned earlier, prior studies show that long-term institutional ownership is positively associated with firm's governed. While I argue that the negative association between long-term institutional ownership and shareholder proposals could be due to better CG/ monitoring and higher/effective private engagement with the management, future research investigation of this issue would be of great value.

Third, this research did not study the effect of shareholder proposals on targeted firms' future operating performance and long-term value. Indeed, prior studies find no or modest evidence on the long-term effect of shareholder proposal submission. However, because shareholder proposals in the UK are binding by law if passed and mainly seek board changes (appointment and removal of directors), it would be expected to find that there is a long-term effect of passed shareholder proposals. A counter argument that should be considered with shareholder proposals, especially binding ones, is that they might disrupt the decision-making process within the firm, which might lead to negative consequences (Bainbridge, 2006). Notwithstanding, this relationship might be moderated by firm's corporate governance or ownership structure. For example, Neubaum and Zahra (2002) find that while institutional investors' activism has no significant effect on firm's corporate future performance, this relationship is significantly and positively moderated by long-term institutional ownership.

Finally, as mentioned in the background section and confirmed by this study, the number and the outcomes (i.e. market reaction and voting outcome) of shareholder proposals have been evolving over time. Thus, in future research, scholars should seek to explore the role of the financial crisis and other corporate scandals in the evolution of shareholder activism. This is especially important, since these crises are followed by new/reviewed regulations which tend to empower shareholders and encourage more shareholder engagement. For example, my descriptive statistics show that, while the average annual number of shareholder proposals is 14 from 1998 to 2006, there were 44 during the period of the financial crisis from 2007 to 2010.[17] Then, there is a clear decrease in 2011 and 2012 followed by a rebound to an average of 59 proposals per year from 2013 to 2016. It is worth mentioning that the Financial Reporting Council published updated versions of the UK Corporate Governance Code and Stewardship Code in 2012.

[17] The increase is larger for shareholder proposals targeting financial institutions.

7. References

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Conclusion

This thesis consists of three essays that aim to investigate the role of institutional investors' investment horizon on firm's corporate policies. While the first two essays focus on the impact of the presence of institutional investors with long-term horizon on corporate cash holdings as essential element in corporate finance, the third essay studies the role of investor horizon on firm's decision-making though its effect on the probability of targeting firm with shareholder proposals and the outcome of these proposals. This thesis focuses on the UK firms traded on the London Stock Exchange over the period from 2000 to 2016.

The first essay provides novel empirical evidence on the impact of long-term institutional ownership on corporate cash holdings. I build on economic perspectives, the behavioural theory and the value-creation versus value-appropriation literatures. My analysis shows that long-term institutional ownership is associated with lower cash holdings and that this negative relationship is significantly more pronounced for firms with high agency costs. I further show that the link between long-term institutional ownership and cash holdings is context specific. In particular, my findings show that firms with high presence of long-term institutional investors hold more cash if they are more diversified and face lower agency costs; however, firms with high presence of long-term institutional investors are pressured to further reduce their cash holding when agency costs are high even if they operate in industries with high growth opportunities and industries with high R&D intensity. Overall, my findings are robust to several estimation strategies; firm fixed effect estimation, IV estimation and control for firm's corporate governance, and consistent with my predications.

Beyond the scope of the first essay, the documented empirical evidence suggests new directions and potential avenues for future research. First, as this essay finds that the magnitude of the agency costs could aggravate or alleviate the negative relationship between long-term institutional ownership and firms' cash holdings and that large cash holdings are often connected to potential problems, an interesting research question might be as follows: does the impact of long-term institutional ownership on cash depend on the level of cash that firm holds? Second, this essay suggests that the monitoring role of long-term institutional investors is driven by the implications of cash for firm performance. Thus, what is the relationship between the presence of long-term institutional investors and the value of firms' cash holdings? Third, the interplay between different theories and perspectives enables this study to enrich our understanding of how the firms' contexts and characteristics determine the relevance of theory

being adopted to explain corporate cash holdings. Adopting a multi-view approach could contribute to the literature of cash holdings. Fourth, the findings of this study support recent research on the importance of considering the heterogeneity of institutional investors when studying their monitoring role and the influence on firms' policies. Finally, while this essay focuses on firms' cash holdings as a channel to study the impact of contexts on the monitoring role of long-term institutional investors, exploring other channels with relative contexts is a fruitful area for future research to confirm my novel evidence.

The second essay investigates the effect of institutional investors' investment horizon on the cash deviation from the optimal level of cash. Incorporating agency concerns and precautionary needs of cash holdings, I find that the impact of long-term institutional ownership on corporate cash holdings depends on the cash deviation from the optimal level of cash. On the one hand, I find that long-term institutional ownership is negatively associated with cash holdings only for firms with excess cash; on the other hand, firms with high presence of long-term institutional investors increase cash when they hold cash below the optimal level. I further show that long-term institutional ownership is associated with higher value of cash holdings. The second essay also shows that long-term institutional ownership has positive moderating effect on the negative relationship between excess cash and firm's operating performance. Overall, my findings support my predications on the positive monitoring role of long-term institutional investors on how much firm holds cash, how firm uses excess cash and how much cash contributes to firm value. Overall, my findings are in line with my predications and are robust to several robustness tests.

The findings of the second essay suggest several directions and avenues for future research. First, incorporating both the agency and the precautionary motive views helps explain the contradictory findings in the literature on the effect of long-term institutional ownership on the level of a firm's cash holdings. Second, this study did not consider the effect of adjustment costs of cash holdings. It may be interesting to explore how the adjustment costs will moderate the relationship between long-term institutional ownership and a firm's cash holdings. Finally, my empirical results support prior studies on the negative effect of cash deviation from the optimal level of cash on a firm's value. Future research should investigate the role of the firm's environment and characteristics on moderating this negative relationship. For example, is the negative effect of cash deficit on firms' operating performance and value more pronounced for firms that operate in industries with high growth or many investment opportunities?

In the third/last essay, I build on the agency view and the monitoring function of institutional investors to investigate the impact of institutional investors with long-term investment horizon on the probability of shareholder proposal targeting, the market reaction to shareholder proposal and the voting outcome of these proposals. First, my targeting analysis shows that firms with high proportion of long-term institutional ownership are less likely to be targeted by shareholder proposals. Then, I show that while cumulative abnormal returns (CARs) around dates of shareholder proposal general meeting are negative on average, firms with high presence of long-term institutional investors experience positive CARs. Further, the voting outcome analysis shows that shareholder proposals targeting firms with high proportion of long-term institutional ownership receive less (more) dissent (in favour) voting using serval voting proxies. In further analysis, I show the established relationship in the literature between pressure-resistant institutional ownership and shareholder proposal's targeting and outcome is driven by long-term institutional investors. This essay not only confirms the previously reported important role of investor horizon on influencing firm's polices, governance and strategies, but also provides evidence on how such impact occurred.

The last essay contains several potential limitations that could provide avenues for future research. First, owing to data unavailability, I did not consider the potential effect of the sponsor identity on the outcomes of shareholder proposals that are documented within some US-based studies. Besides controlling for its potential effect in the outcome models, it would be interesting to investigate how the sponsor identity of shareholder proposals would moderate the relationship between institutional ownership and market reaction and voting outcome. Second, this essay, similar to most prior research investigating public shareholder activism (i.e. shareholder proposals and campaigns), considers 'visible activism', which implicitly overrides the role of private shareholder activism (i.e. behind-the-scenes negotiations) (Goranova et al., 2017). Third, this research did not study the effect of shareholder proposals on targeted firms' future operating performance and long-term value. Future research cloud explore the effect of shareholder proposals on future operating performance and how this relationship might be moderated by institutional ownership. Finally, as discussed in the essay that the number and the outcomes (i.e. market reaction and voting outcome) of shareholder proposals have been evolving over time. Thus, in future research, scholars should seek to explore the role of the financial crisis and other corporate scandals in the evolution of shareholder activism. This is especially important, since these crises are followed by new/reviewed regulations which tend to empower shareholders and encourage more shareholder engagement.

Overall, this thesis focuses on the role of institutional investors in corporate finance and corporate governance. The findings of this thesis support recent research on the importance of considering the heterogeneity of institutional investors when studying their monitoring role and their influence on firms' policies. This thesis focuses on the institutional investors' investment horizon and finds such distinction is an important determinant of the monitoring and engaging behaviour of institutional investors. However, while this finding is true and confirms recent empirical literature on the role of investment horizon, this thesis also show some evidence that even institutional investors with long investment horizon might have different abilities and incentives/interests to influence firms' policies (i.e. indexer vs. non-indexer, pressure-sensitive vs. pressure-resistant, and foreign vs. domestic). Future studies that aim to investigate the role of institutional ownership must not only critically take into account the heterogeneity of institutional investors but should also simultaneously consider the different distinctions that theoretically have been argued and empirically have been documented in the literature to affect the role of institutional investors. As recent literature on institutional ownership focuses on how the monitoring and engagement role of institutional investors mitigates the negative effect of agency-principle agency costs on firm's value, future research should pay also attention to effect of the principle-principle agency costs that might arise from the heterogeneous shareholder interests and abilities.

Appendix A

Table A1. Definitions of Variables

Dependent variable	
Cash	The ratio of cash and cash equivalents to the book value of assets.
Independent variables	
Long-Term IO	The ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least eight quarters (two years).
Long-Term IO (non-indexer)	The ratio of total outstanding shares held by all long-term institutional investors who do not invest in the studied firm as such firm being part of a particular stock market index.
Long-Term IO (indexer)	The ratio of total outstanding shares held by all long-term institutional investors who invest in the studied firm as such firm being part of a particular stock market index.
Long-Term IO (low portfolio turnover)	The ratio of total outstanding shares held by all long-term institutional investors who have a low turnover portfolio.
Long-Term IO (high portfolio turnover)	The ratio of total outstanding shares held by all long-term institutional investors who have a high turnover portfolio.
Control variables	
Institutional Ownership	The ratio of total outstanding shares held by all institutional investors.
Blockholding (5%)	The ratio of total outstanding shares held by large investors (not necessarily institutional) with at least 5% shareholding.
Size	The natural log of the book value of total assets.
Leverage	The ratio of total debt to the book value of total assets.
Market-to-book	The ratio of (the book value of assets – the book value of equity + the market value of equity) to the book value of assets.
Cash Flow	The ratio of (EBITD – debt interest – taxes – dividend) to the book value of total assets.
Industry Sigma	The average standard deviation of cash flows of all firms in the same industry (two-digit SIC) and over the past 10 years. Due to precautionary reasons, I expect that firms operating in an industry with high volatile cash flow will hold more cash.
NWC	The ratio of (current assets – current liabilities + cash) to the book value of assets.
R&D	The ratio of research and development to sales. Due to frequent missing data in research and development expenses, I follow most literature and substitute the missing data of research and development expenses with zero when missing.
Capital Exp.	The ratio of capital expenditure to the book value of total assets.
Acquisition	The acquisitions to the book value of total assets.
Dividend (dummy)	A dummy variable equals 1 if the firm paid a dividend, and zero otherwise.

Table A2. Cash holdings and industry competition

The table presents the results of OLS regressions examining how the effect of long-term institutional ownership on firm cash holdings is moderated by industry competition and severity of agency costs. The analysis is performed on the sample of the UK public firms during the period from 2000 to 2016. Long-term IO is defined as a ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least 8 quarters (2 years). Agency cost is defined as high (low) if firm-specific agency cost above (below) median value of the inverse asset turnover variable. Industry Competition is defined as the sum of squared market shares of firms in an industry, where firm sales are used to calculate market shares. Detailed definitions of all variables are reported in Appendix A Table A1. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. *,** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Cash/Total Assets								
	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Long-term IO	-0.068**	-0.028	-0.098**						
	(0.027)	(0.033)	(0.045)						
Long-term IO (nonindexer)				-0.049*	-0.010	-0.081*			
				(0.026)	(0.031)	(0.049)			
Long-term IO (low turnover)							-0.024	0.004	-0.042
							(0.022)	(0.025)	(0.043)
Industry Competition	-0.001	0.022	-0.003	-0.002	0.014	0.007	-0.002	0.014	0.004
	(0.022)	(0.023)	(0.042)	(0.022)	(0.022)	(0.042)	(0.022)	(0.021)	(0.042)
Long-term IO x Industry Competition	-0.101***	-0.085*	-0.112*						
	(0.039)	(0.046)	(0.066)						
Long-term IO (nonindexer) x Industry Competition				-0.101**	-0.062	-0.141*			
				(0.043)	(0.046)	(0.081)			
Long-term IO (low) x Industry Competition							-0.125***	-0.081*	-0.167**
							(0.042)	(0.046)	(0.074)
Institutional Ownership	0.093***	0.062**	0.115***	0.056***	0.030	0.076***	0.039***	0.023	0.049**
	(0.021)	(0.024)	(0.034)	(0.017)	(0.020)	(0.027)	(0.014)	(0.016)	(0.024)
Blockholding (5%)	0.002	-0.016	0.026	0.020	-0.008	0.054*	0.014	-0.009	0.043
	(0.016)	(0.017)	(0.029)	(0.017)	(0.018)	(0.029)	(0.016)	(0.017)	(0.029)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.386	0.421	0.413	0.387	0.420	0.415	0.388	0.421	0.415
N	11239	6708	4421	11202	6692	4403	11121	6654	4362

Table A3. Cash holdings and corporate governance

The table presents the results of OLS regressions examining how the effect of long-term institutional ownership on firm cash holdings is moderated by corporate governance and severity of agency costs. The analysis is performed on the sample of the UK public firms during the period from 2000 to 2016. Long-term IO is defined as a ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least 8 quarters (2 years). Agency cost is defined as high (low) if firm-specific agency cost above (below) median value of the inverse asset turnover variable. Corporate governance is a proxy of the overall quality of firm's corporate governance, and it exactly measures firm's 'systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value.' Detailed definitions of all variables are reported in Appendix A Table A1. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. *,** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Cash/Total Assets								
	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Long-term IO	-0.129**	-0.141**	-0.078						
	(0.044)	(0.057)	(0.094)						
Long-term IO (nonindexer)				-0.155***	-0.162**	-0.112			
				(0.052)	(0.056)	(0.104)			
Long-term IO (low turnover)							-0.171***	-0.162**	-0.152
							(0.057)	(0.059)	(0.123)
Corporate Governance	-0.048	-0.039	-0.057	-0.048	-0.044	-0.043	-0.052*	-0.033	-0.078
	(0.033)	(0.032)	(0.070)	(0.033)	(0.031)	(0.068)	(0.027)	(0.026)	(0.054)
Long-term IO x Corporate Governance	0.104	0.120*	0.035						
	(0.063)	(0.064)	(0.126)						
Long-term IO (nonindexer) x Corporate Governance				0.129	0.159*	0.005			
				(0.076)	(0.074)	(0.141)			
Long-term IO (low) x Corporate Governance							0.178**	0.158**	0.148
							(0.077)	(0.070)	(0.159)
Institutional Ownership	0.009	0.036	-0.020	-0.003	0.016	-0.003	-0.021	0.005	-0.046
	(0.036)	(0.042)	(0.039)	(0.022)	(0.025)	(0.024)	(0.019)	(0.019)	(0.030)
Blockholding (5%)	0.029	0.027	0.041	0.047*	0.042*	0.064	0.039	0.037	0.051
	(0.021)	(0.022)	(0.035)	(0.024)	(0.024)	(0.040)	(0.023)	(0.023)	(0.036)
R^2	0.419	0.513	0.395	0.422	0.515	0.403	0.420	0.514	0.397
N	2578	1556	1011	2576	1555	1010	2577	1555	1011

Table A4. Cash holdings and firm opacity

The table presents the results of OLS regressions examining how the effect of long-term institutional ownership on firm cash holdings is moderated by firm opacity and severity of agency costs. The analysis is performed on the sample of the UK public firms during the period from 2000 to 2016. Long-term IO is defined as a ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least 8 quarters (2 years). Agency cost is defined as high (low) if firm-specific agency cost above (below) median value of the inverse asset turnover variable. Firm opacity is the opacity index developed by Anderson et al. (2009), where this index consists of four proxies for firm-level opacity (the natural logarithm of the daily trading volume of firm's stocks, the daily average of the bid-ask spread which is defined as ask price less bid price divided by the average of the ask and bid prices, the natural logarithm of the number of analysts following each frim in a given year, and the square of the difference between analysts' mean forecasts of earning-per-share (EPS) and the actual firm EPS). Detailed definitions of all variables are reported in Appendix A Table A1. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. *,** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Cash/Total Assets								
	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost	All firms	Low agency cost	High agency cost
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Long-term IO	-0.167***	-0.158***	-0.147**						
	(0.042)	(0.049)	(0.065)						
Long-term IO (nonindexer)				-0.178***	-0.130**	-0.212**			
				(0.051)	(0.052)	(0.080)			
Long-term IO (low turnover)							-0.161***	-0.119**	-0.173*
							(0.052)	(0.055)	(0.082)
Firm Opacity	-0.037	-0.082*	-0.009	-0.042	-0.069	-0.034	-0.026	-0.056	-0.012
	(0.039)	(0.042)	(0.057)	(0.040)	(0.041)	(0.058)	(0.036)	(0.037)	(0.051)
Long-term IO x Firm Opacity	0.164**	0.179**	0.132						
	(0.066)	(0.076)	(0.118)						
Long-term IO (nonindexer) x Firm Opacity				0.197**	0.155*	0.230			
				(0.081)	(0.085)	(0.146)			
Long-term IO (low) x Firm Opacity							0.197**	0.154*	0.200
							(0.080)	(0.083)	(0.139)
Institutional Ownership	0.037	0.032	0.021	0.012	0.007	0.006	-0.005	-0.005	-0.015
	(0.021)	(0.032)	(0.033)	(0.016)	(0.021)	(0.027)	(0.017)	(0.021)	(0.026)
Blockholding (5%)	0.012	0.007	0.029	0.030	0.020	0.049	0.022	0.013	0.041
	(0.022)	(0.020)	(0.043)	(0.023)	(0.020)	(0.045)	(0.022)	(0.021)	(0.044)
R^2	0.441	0.522	0.433	0.442	0.521	0.435	0.440	0.521	0.433
N	5669	3356	2248	5667	3355	2247	5662	3351	2246

Appendix B

Table B1. Definitions of Variables

Panel A: Ownership variables	
Long-term IO	The ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least eight quarters (two years).
Long-term IO (dummy)	A dummy variable equals 1 for firms in the top quartile of long-term institutional ownership, and zero for firms in the bottom quartile.
Long-term IO (non-indexer)	The ratio of total outstanding shares held by all long-term institutional investors who do not invest in the studied firm as such firm being part of a particular stock market index.
Long-term IO (indexer)	The ratio of total outstanding shares held by all long-term institutional investors who invest in the studied firm as such firm being part of a particular stock market index.
Long-term IO (low portfolio turnover)	The ratio of total outstanding shares held by all long-term institutional investors who have a low turnover portfolio.
Long-term IO (high portfolio turnover)	The ratio of total outstanding shares held by all long-term institutional investors who have a high turnover portfolio.
Institutional Ownership	The ratio of total outstanding shares held by all institutional investors.
Blockholding (5%)	The ratio of total outstanding shares held by large investors (not necessarily institutional) with at least 5% shareholding.
Panel B: Cash dependent variables	
Cash	The ratio of cash and cash equivalents to the book value of assets.
Dev	The difference between the actual cash level the firm holds and the predicted optimal cash level.
|Dev|	The absolute value of Dev.
Excess cash	Equals to Dev when Dev > 0, and missing otherwise.
Cash deficit	Equals to Dev when Dev < 0, and missing otherwise.
Large excess cash	Equals to Dev when Dev at top tertile, and missing otherwise.
Large cash deficit	Equals to Dev when Dev at bottom tertile, and missing otherwise.
Panel C: Firm-level controls	
Size	The natural log of the book value of total assets.
Leverage	The ratio of short and long debt to the book value of total assets.
Market-to-book	The ratio of (the book value of assets – the book value of equity + the market value of equity) to the book value of total assets.
Cash Flow	The ratio of (EBITD – debt interest – taxes – dividend) to the book value of total assets.
Industry Sigma	The average standard deviations of cash flows of all firms in the same industry (two-digit SIC) and over the past 10 years.
NWC	The ratio of (current assets – current liabilities – cash) to the book value of assets.
R&D	The ratio of research and development expenses to sales.
Capital Expenditure	The ratio of capital expenditure to the book value of total assets.

Acquisition	The acquisitions to the book value of total assets.
Dividend	A dummy variable equals 1 if the firm paid a dividend, and zero otherwise.
Panel D: Excess return model	
Excess return	The stock return over time *t*-1 to *t* minus Fama and French's (1993) 25-size and book-to-market matched portfolio return from time *t*-1 to *t*.
ΔCash/ME	The ratio of change of cash and cash equivalents from time *t*-1 to *t* to the market value of equity at time *t*-1.
ΔEarnings/ME	The ratio of change of earnings before extraordinary items from time *t*-1 to *t* to the market value of equity at time *t*-1.
ΔNet Assets/ME	The ratio of change of net assets (the book value of assets – cash and cash equivalents) from time *t*-1 to *t* to the market value of equity at time *t*-1.
ΔR&D/ME	The ratio of change of research and development expenses from time *t*-1 to *t* to the market value of equity at time *t*-1.
ΔInterest/ME	The ratio of change of interest expenses from time *t*-1 to *t* to the market value of equity at time *t*-1.
ΔDividends/ME	The ratio of change of common dividends from time *t*-1 to *t* to the market value of equity at time *t*-1.
Cash/ME	The ratio of cash and cash equivalents at time *t* to the market value of equity at time *t*-1.
Debt/MV	The ratio of short and long debt at time *t* to the market value of equity plus short and long debt at time *t*.
New Finance/ME	The ratio of new finance (net new equity issues + net new debt issues) at time *t* to the market value of equity at time *t*-1.
Panel E: Operating performance analysis	
RONA	The ratio of operating income at time *t* over the net assets at time *t*.
RONA (Industry adjusted)	The ratio of operating income at time *t* over the net assets at time *t* minus the industry-year median ratio of operating income over the net assets.
Net Assets	The natural log of the net assets at time *t*.
PP&E	The ratio of property, plant and equipment book value at time *t* to the net assets at time *t*.
Panel F: Market-to-book model	
Market Value/NA	The ratio of market value of equity plus total liabilities at time *t* to the net assets (the book value of assets – cash and cash equivalents) at time *t*.
ΔCash/NA	The ratio of change of cash and cash equivalents from time *t*-1 to *t* to the net assets at time *t*.
XCash/NA	The ratio of difference between cash and cash equivalents at time *t* and the predicated optimal level to the net assets at time *t-1*.
ΔF2 Market Value/NA	The ratio of change of market value of equity plus total liabilities over at time *t* to *t*+2 to the net assets at time *t*.
ΔL2 Net Assets/NA	The ratio of change of net assets over at time *t*-2 to *t* to the net assets at time *t*.
ΔF2 Net Assets/NA	The ratio of change of net assets over at time *t* to *t*+2 to the net assets at time *t*.

Earnings/NA	The ratio of earnings before extraordinary items at time *t* to the net assets at time *t*.
ΔL2 Earnings/NA	The ratio of change of earnings before extraordinary items over at time *t*-2 to *t* to the net assets at time *t*.
ΔF2 Earnings/NA	The ratio of change of earnings before extraordinary items over at time *t* to *t*+2 to the net assets at time *t*.
R&D/NA	The ratio of research and development expenses at time *t* to the net assets at time *t*.
ΔL2 R&D/NA	The ratio of change of research and development expenses over at time *t*-2 to *t* to the net assets at time *t*.
ΔF2 R&D/NA	The ratio of change of research and development expenses over at time *t* to *t*+2 to the net assets at time *t*.
Dividends/NA	The ratio of common dividends at time *t* to the net assets at time *t*.
ΔL2 Dividends/NA	The ratio of change of common dividends over at time *t*-2 to *t* to the net assets at time *t*.
ΔF2 Dividends/NA	The ratio of change of common dividends over at time *t* to *t*+2 to the net assets at time *t*.
Interest/NA	The ratio of interest expenses at time *t* to the net assets at time *t*.
ΔL2 Interest/NA	The ratio of change of interest expenses over at time *t*-2 to *t* to the net assets at time *t*.
ΔF2 Interest/NA	The ratio of change of interest expenses over at time *t* to *t*+2 to the net assets at time *t*.

Table 8. The heterogeneous effect of long-term institutional ownership on cash holdings (robustness)

Table 8 reports the results of the heterogeneous effects of long-term institutional investors on cash holdings. Panel A shows the results of indexer and non-indexer long-term institutional investors, and Panel B shows the results of long-term institutional investors with low and high portfolio turnover. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A

Dependent variable =	*Cash*	*Cash*	*Cash*	*|Dev|*	*|Dev|*	*|Dev|*
	(1)	(2)	(3)	(4)	(5)	(6)
Long-term IO (indexer)	0.075		0.109	0.036		0.051
	(0.069)		(0.067)	(0.044)		(0.042)
Long-term IO (non-indexer)		-0.098***	-0.075***		-0.041***	-0.034***
		(0.018)	(0.015)		(0.009)	(0.009)
Institutional Ownership	-0.020	0.053***	0.023	-0.013*	0.018*	0.006
	(0.015)	(0.015)	(0.015)	(0.007)	(0.009)	(0.009)
Blockholding (5%)	0.009	0.030*	0.023	-0.008	0.000	-0.002
	(0.018)	(0.017)	(0.019)	(0.011)	(0.010)	(0.011)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.31	0.31	0.32	0.25	0.24	0.25
N	7430	11218	7424	7430	11218	7424

Panel B

Dependent variable =	*Cash*	*Cash*	*Cash*	*|Dev|*	*|Dev|*	*|Dev|*
	(1)	(2)	(3)	(4)	(5)	(6)
Long-term IO (high portfolio turnover)	0.076		0.047	0.067*		0.058
	(0.068)		(0.069)	(0.037)		(0.038)
Long-term IO (low portfolio turnover)		-0.079***	-0.065***		-0.029***	-0.019*
		(0.013)	(0.017)		(0.009)	(0.010)
Institutional Ownership	-0.011	0.031**	0.018	-0.012*	0.006	-0.004
	(0.011)	(0.013)	(0.013)	(0.006)	(0.007)	(0.008)
Blockholding (5%)	0.028	0.024	0.033	-0.002	-0.003	0.000
	(0.019)	(0.017)	(0.019)	(0.011)	(0.010)	(0.011)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.31	0.31	0.31	0.24	0.24	0.24
N	8850	11137	8792	8850	11137	8792

Table 9a. Long-term institutional ownership and cash holdings with firm fixed effect (robustness)

Table 9a reports the results of the effect of long-term institutional ownership on cash holdings and cash deviations using firm fixed effect. Panel A replicates the models in Table 3 but using firm fixed effect instead of industry fixed effect. Panel B replicates the models in Table 4 but using firm fixed effect instead of industry fixed effect. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and firm and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A

	Dependent Variable = Cash				
	(1)	(2)	(3)	(4)	(5)
	All firms	*Excess cash*	*Cash deficit*	*Large excess cash*	*Large cash deficit*
Long-term IO	-0.099***	-0.093***	-0.017	-0.093***	-0.016*
	(0.018)	(0.027)	(0.010)	(0.030)	(0.008)
Institutional Ownership	0.092***	0.112***	0.022**	0.114***	0.014
	(0.015)	(0.024)	(0.009)	(0.026)	(0.010)
Blockholding (5%)	0.003	-0.016	-0.007	-0.015	-0.005
	(0.016)	(0.018)	(0.006)	(0.019)	(0.006)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.65	0.83	0.65	0.84	0.71
N	11135	4430	6409	3530	3419

Panel B

Dependent Variable =	*Dev*	*|Dev|*	*ΔCash*	*ΔCash*	*ΔCash*
	(1)	(2)	(3)	(4)	(5)
	All firms	*All firms*	*All Firms*	*Excess cash*	*Cash deficit*
Long-term IO	-0.099***	-0.033**	0.007	-0.021	0.054***
	(0.018)	(0.013)	(0.014)	(0.034)	(0.016)
Institutional Ownership	0.092***	0.034***	-0.020	0.005	-0.062***
	(0.015)	(0.011)	(0.018)	(0.036)	(0.020)
Blockholding (5%)	0.003	0.001	-0.031***	-0.054**	0.001
	(0.016)	(0.010)	(0.011)	(0.022)	(0.011)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.50	0.50	0.16	0.28	0.31
N	11135	11135	10519	4152	6058

Table 9b. Long-term institutional ownership and the value of cash holdings with firm fixed effect (robustness)

Table 9b reports the results of the effect of long-term institutional ownership on the value of cash holdings using firm fixed effect. Table 9b replicates the first and last two columns of Table 5. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and firm and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

	Dependent Variable = Excess Return			
	(1)	(2)	(3)	(4)
	All firms	*All firms*	*High long-term IO*	*Low long-term IO*
Long-term IO	-0.073			
	(0.059)			
Long-term IO X ΔCash/ME	1.049**			
	(0.451)			
Long-term IO (dummy)		-0.131		
		(0.099)		
Long-term IO (dummy) X ΔCash/ME		0.523**		
		(0.206)		
ΔCash/ME	0.592**	1.000***	1.597***	0.757*
	(0.212)	(0.258)	(0.307)	(0.371)
Firm-level controls	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
R^2	0.23	0.33	0.36	0.35
N	7563	3280	2199	987

Table 10. IV estimation of the effect of long-term institutional ownership on cash holdings (robustness)

Table 10 reports the results of 2SLS regressions of the effect of long-term institutional ownership on cash holdings. Column (1) shows the results of the first stage regression where the industry median of long-term institutional ownership and lagged long-term institutional ownership are used as instruments for long-term institutional ownership. Columns (2) – (6) show the results of the second stage regression. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable =	*Long-term IO*	*Cash*	*Cash*	*Cash*	*Dev*	*|Dev|*
	(1)	(2)	(3)	(4)	(5)	(6)
	All firms	*All firms*	*Cash deficit*	*Excess cash*	*All firms*	*All firms*
	(First-stage)	(Second-stage)				
Industry Median of Long-term IO	0.042***					
	(0.006)					
Lagged Long-term IO	0.442***					
	(0.023)					
Long-term IO		-0.132***	-0.094**	0.000	-0.122***	-0.067***
		(0.032)	(0.040)	(0.012)	(0.031)	(0.017)
Institutional Ownership	0.494***	0.107***	0.066*	0.013	0.099***	0.045**
	(0.020)	(0.028)	(0.035)	(0.008)	(0.028)	(0.015)
Blockholding (5%)	-0.023***	0.009	-0.005	0.012*	0.009	-0.010
	(0.005)	(0.017)	(0.019)	(0.006)	(0.016)	(0.009)
Size	0.002**	-0.009***	-0.020***	-0.004***	0.000	-0.007***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Leverage	-0.001	-0.255***	-0.348***	-0.160***	0.017	-0.082***
	(0.004)	(0.017)	(0.017)	(0.007)	(0.017)	(0.010)
Market-to-Book	-0.001	0.023***	0.027***	0.014***	-0.001	0.008***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Cash Flow	-0.000	-0.018	-0.050**	0.012**	-0.008	-0.033***
	(0.004)	(0.015)	(0.019)	(0.005)	(0.015)	(0.009)
Industry Sigma	0.005***	-0.000	0.013*	0.001	-0.005	0.005
	(0.001)	(0.006)	(0.007)	(0.002)	(0.005)	(0.003)
NWC	-0.003	-0.124***	-0.207***	-0.067***	-0.006	-0.054***
	(0.002)	(0.014)	(0.015)	(0.006)	(0.014)	(0.007)
R&D	0.013**	0.173***	0.234***	0.115***	-0.016	0.071***
	(0.005)	(0.040)	(0.033)	(0.015)	(0.040)	(0.016)
Capital Expenditure	-0.038***	-0.185***	-0.309***	-0.073***	-0.039	-0.092***
	(0.010)	(0.037)	(0.044)	(0.019)	(0.036)	(0.021)
Acquisition	-0.050***	-0.214***	-0.356***	-0.051***	-0.022	-0.145***
	(0.014)	(0.026)	(0.024)	(0.014)	(0.025)	(0.014)
Dividend	0.010***	-0.017***	-0.044***	-0.010***	0.007	-0.016***
	(0.002)	(0.006)	(0.007)	(0.002)	(0.005)	(0.003)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap Wald		197.86	147.69	174.18	197.86	197.86
Hansen j statistic		0.96	3.61	2.63	0.25	4.40
Hansen j (p-value)		0.33	0.06	0.10	0.62	0.04
R^2	0.92	0.28	0.64	0.39	0.00	0.21
N	10461	10457	4263	6194	10457	10457

Table 11a. Long-term institutional ownership and the value of cash holdings using the market-to-book model (robustness)

Table 11 reports the results of the effect of long-term institutional ownership on the value of cash holdings using the market-to-book model of Fama and French (1998). Columns (1) and (2) show the results of the full sample. Columns (3) and (4) show the results of a subsample of firms with excess cash. Columns (5) and (6) show the results of a subsample of firms with cash deficits. Two measures are used for long-term institutional ownership: Long-term IO is defined as the ratio of total outstanding shares held by all long-term institutional investors and Long-term IO (dummy) is an indicator variable that equals 1 for firms in the top quartile of long-term institutional ownership, and zero for firms in the bottom quartile. In Columns (1) – (6), the variables of interest are the interactions between long-term IO and XCash/NA which indicate to the moderating role of long-term institutional ownership on the effect of excess cash on market-to-book value. Columns (7) and (8) show the results of the baseline specification of the market-to-book model on subsamples of firms in the top quartile of long-term institutional ownership and firms in the bottom quartile, respectively. Standard errors (in brackets) are robust to arbitrary heteroscedasticity. Firm and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

	Dependent Variable = Market value/Net Assets							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All firms	*All firms*	*Excess cash*	*Excess cash*	*Cash deficit*	*Cash deficit*	*High long-term IO*	*Low long-term IO*
Long-term IO	-0.102		-0.550*		0.250			
	[0.159]		[0.318]		[0.210]			
Long-term IO X XCash/NA	2.412***		2.425**		3.758			
	[0.799]		[1.067]		[2.305]			
Long-term IO (dummy)		-0.015		-0.358		0.409**		
		[0.140]		[0.229]		[0.206]		
Long-term IO (dummy) X XCash/NA		1.890***		2.147***		5.498***		
		[0.306]		[0.388]		[1.923]		
XCash/NA	0.147	0.175	0.191	-0.220	1.586**	0.047	2.108***	-0.132
	[0.262]	[0.274]	[0.371]	[0.395]	[0.698]	[0.955]	[0.286]	[0.404]
ΔF2 Market Value/NA	-0.254***	-0.197***	-0.274***	-0.238***	-0.246***	-0.132*	-0.210***	-0.047
	[0.027]	[0.042]	[0.033]	[0.036]	[0.050]	[0.071]	[0.040]	[0.113]
ΔL2 Net Assets/NA	0.043	0.075	0.108	0.068	-0.154	-0.139	-0.037	0.129
	[0.068]	[0.074]	[0.121]	[0.102]	[0.094]	[0.090]	[0.105]	[0.154]
ΔF2 Net Assets/NA	0.746***	0.605***	0.839***	0.761***	0.543***	0.407***	0.365***	0.417***
	[0.097]	[0.105]	[0.153]	[0.144]	[0.088]	[0.135]	[0.117]	[0.124]
Interest/NA	-0.092	0.352	-0.203	0.635	0.363	0.175	1.862***	-0.268
	[0.261]	[0.314]	[0.366]	[0.415]	[0.324]	[0.393]	[0.465]	[0.600]
ΔL2 Earnings/NA	0.288***	0.412**	0.128	0.345	0.153	0.089	0.008	0.740***

	[0.105]	[0.166]	[0.148]	[0.272]	[0.095]	[0.257]	[0.178]	[0.151]
ΔF2 Earnings/NA	0.100	0.354	-0.175	0.145	0.443**	0.726***	1.370***	0.016
	[0.227]	[0.238]	[0.344]	[0.584]	[0.209]	[0.228]	[0.340]	[0.356]
Dividends/NA	7.007***	6.700***	6.468**	6.416**	8.333***	11.071***	5.784***	19.308***
	[1.887]	[1.846]	[2.902]	[2.568]	[1.789]	[2.928]	[1.748]	[6.189]
ΔL2 Dividends/NA	1.616	0.922	3.357	-1.118	1.286	-0.406	1.354	-2.451
	[1.217]	[1.115]	[2.379]	[1.609]	[1.045]	[1.790]	[1.167]	[3.354]
ΔF2 Dividends/NA	6.325***	3.412***	6.966***	2.708*	5.741***	5.355***	3.249***	4.764
	[1.547]	[1.055]	[2.129]	[1.635]	[1.051]	[1.532]	[1.026]	[3.020]
Interest/NA	-2.314	7.465*	2.514	3.806	-4.747	-0.194	2.759	10.147
	[3.667]	[4.282]	[5.427]	[8.137]	[3.744]	[5.283]	[4.865]	[7.574]
ΔL2 Interest/NA	-4.094*	-4.870***	-4.617	-3.596	-1.012	-4.140*	-3.446*	-4.717
	[2.209]	[1.865]	[3.247]	[2.938]	[2.523]	[2.439]	[2.001]	[4.325]
ΔF2 Interest/NA	-5.725**	-0.110	-4.755	-0.093	-2.330	0.812	4.076	-2.722
	[2.564]	[3.131]	[3.821]	[5.159]	[3.400]	[2.527]	[4.373]	[2.549]
R&D/NA	7.363***	7.843***	4.841*	8.599***	11.967***	1.056	6.656***	8.255***
	[1.914]	[1.747]	[2.658]	[2.402]	[3.173]	[4.555]	[2.406]	[2.323]
ΔL2 R&D/NA	0.881	-3.960**	1.430	-4.514	-0.506	-1.548	-4.228	-1.852
	[1.465]	[1.921]	[2.299]	[3.380]	[1.323]	[2.384]	[3.135]	[2.489]
ΔF2 R&D/NA	2.573**	2.719	1.406	0.467	1.771	8.038*	4.751**	-1.693
	[1.071]	[2.028]	[1.379]	[1.462]	[2.230]	[4.435]	[2.351]	[2.107]
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.81	0.85	0.83	0.86	0.77	0.87	0.88	0.77
N	4223	1832	1539	662	2458	1027	1444	345

Table 11b. Long-term institutional ownership and the value of cash holdings using the market-to-book model (robustness)

Table 11b reports the results of the effect of long-term institutional ownership on the value of cash holdings using the market-to-book model of Fama and French (1998). Columns (1) and (2) show the results of the full sample. Columns (3) and (4) show the results of a subsample of firms with excess cash. Columns (5) and (6) show the results of a subsample of firms with cash deficits. Two measures are used for long-term institutional ownership: Long-term IO is defined as the ratio of total outstanding shares held by all long-term institutional investors and Long-term IO (dummy) is an indicator variable that equals 1 for firms in the top quartile of long-term institutional ownership, and zero for firms in the bottom quartile. In Columns (1) – (6), the variables of interest are the interactions between long-term IO and ΔL1 Cash which indicate to the moderating role of long-term institutional ownership on the effect of the change in cash holdings on market-to-book value. Columns (7) and (8) show the results of the baseline specification of the market-to-book model on subsamples of firms in the top quartile of long-term institutional ownership and firms in the bottom quartile, respectively. The standard errors reported in brackets are robust to Huber-White sandwich estimators. Firm and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

	Dependent Variable = Market value/Net Assets							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All firms	*All firms*	*Excess cash*	*Excess cash*	*Cash deficit*	*Cash deficit*	*High long-term IO*	*Low long-term IO*
Long-term IO	-0.125		-0.175		-0.169			
	[0.202]		[0.377]		[0.171]			
Long-term IO X ΔL1 Cash	1.451		0.997		0.918			
	[1.155]		[1.332]		[1.893]			
Long-term IO (dummy)		-0.156		-0.854***		-0.322*		
		[0.212]		[0.279]		[0.190]		
Long-term IO (dummy) X ΔL1 Cash		1.046**		1.069**		2.058*		
		[0.417]		[0.470]		[1.231]		
ΔCash/NA	0.263	0.840***	0.329	0.462**	0.174	0.277	1.150***	0.838***
	[0.308]	[0.219]	[0.332]	[0.233]	[0.421]	[0.528]	[0.309]	[0.260]
ΔF2 Market Value/NA	-0.247***	-0.235***	-0.228***	-0.240***	-0.366***	-0.304***	-0.286***	-0.192***
	[0.039]	[0.040]	[0.045]	[0.033]	[0.054]	[0.087]	[0.049]	[0.050]
ΔL2 Net Assets/NA	0.283***	-0.003	0.370**	-0.128	0.023	0.066	-0.078	-0.148
	[0.108]	[0.080]	[0.159]	[0.111]	[0.073]	[0.103]	[0.103]	[0.121]
ΔF2 Net Assets/NA	0.951***	0.807***	0.901***	0.775***	0.819***	0.663***	0.760***	0.613***
	[0.093]	[0.098]	[0.128]	[0.113]	[0.106]	[0.128]	[0.199]	[0.111]
Interest/NA	-2.491***	-0.960**	-3.564***	-0.812	-0.666	-0.918*	1.177	-1.691***
	[0.771]	[0.390]	[1.100]	[0.508]	[0.467]	[0.516]	[1.031]	[0.586]

ΔL2 Earnings/NA	0.503**	0.277	0.325	-0.019	0.393***	0.487**	-0.029	0.347
	[0.212]	[0.178]	[0.288]	[0.310]	[0.114]	[0.222]	[0.203]	[0.286]
ΔF2 Earnings/NA	-1.229***	-0.593**	-1.814***	-1.115***	-0.208	-0.112	0.231	-0.553*
	[0.409]	[0.285]	[0.548]	[0.301]	[0.327]	[0.505]	[1.026]	[0.320]
Dividends/NA	14.714***	10.915***	16.464***	12.047***	11.447***	11.499***	10.792***	-1.374
	[2.149]	[2.300]	[3.234]	[3.535]	[2.097]	[2.964]	[2.092]	[8.556]
ΔL2 Dividends/NA	0.247	-0.253	1.369	-3.099	0.713	0.616	0.658	1.734
	[1.199]	[1.240]	[2.262]	[1.938]	[1.073]	[1.772]	[1.236]	[3.643]
ΔF2 Dividends/NA	9.702***	4.734***	11.657***	4.971***	7.654***	6.581***	4.621***	1.404
	[1.522]	[1.228]	[2.198]	[1.782]	[1.271]	[1.643]	[1.157]	[3.196]
Interest/NA	0.830	7.540	7.542	1.794	-3.865	8.249	3.860	12.410
	[4.143]	[5.201]	[6.514]	[7.660]	[3.911]	[5.647]	[5.287]	[9.702]
ΔL2 Interest/NA	-8.496***	-7.581**	-13.958***	-7.878*	-0.877	-1.048	-3.819*	-16.048**
	[2.565]	[3.495]	[4.114]	[4.191]	[2.176]	[3.035]	[2.027]	[7.832]
ΔF2 Interest/NA	-10.196***	-6.625**	-8.022**	-4.966	-6.205*	-2.309	-0.614	-9.434**
	[2.601]	[3.250]	[3.874]	[5.030]	[3.296]	[3.080]	[5.351]	[3.704]
R&D/NA	4.289**	6.420***	2.924	10.169***	7.202***	2.214	8.356***	10.256***
	[1.664]	[1.885]	[2.537]	[1.778]	[2.474]	[4.259]	[2.197]	[2.509]
ΔL2 R&D/NA	2.668*	0.171	2.312	-2.498	0.768	-1.706	-0.234	-1.734
	[1.403]	[1.973]	[2.207]	[2.296]	[1.510]	[2.527]	[2.356]	[2.739]
ΔF2 R&D/NA	3.316***	7.025***	4.152**	9.226***	2.195	9.216**	3.699**	10.722**
	[1.220]	[2.114]	[1.695]	[3.005]	[2.114]	[4.386]	[1.878]	[5.245]
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.76	0.82	0.76	0.87	0.76	0.81	0.84	0.81
N	5369	2363	2315	978	2792	1210	1673	643

Table 12. The use of excess cash and operating performance (robustness)

Table 12 reports the results of the moderating role of long-term institutional ownership on the effect of excess cash on corporate operating performance. The sample in this table includes only firms with excess cash. In Columns (1) – (4), the dependent variable is RONA which is defined as the ratio of operating income to the book value of net assets. In Columns (5) – (8), the dependent variable is RONA (Industry adjusted) which is defined as RONA minus the industry-year median RONA. Columns (1) and (5) (Columns (2) and (6)) show the results of a subsample of firms with excess cash and in the top (bottom) quartile of long-term institutional ownership. Columns (3) and (7) (Columns (4) and (8)) show the results of a subsample of firms with excess cash, in the top (bottom) quartile of long-term institutional ownership and with capital expenditure above industry median. Standard errors (in brackets) are robust to arbitrary heteroscedasticity. Industry and year fixed effects are included in Columns (1) – (4), and firm and year fixed effects are included in Columns (5) –(8). All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable =	*RONA*				*RONA (Industry adjusted)*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Excess cash & high long-term IO	*Excess cash & low long-term IO*	*Excess cash & high capital expenditure & high long-term IO*	*Excess cash & high capital expenditure & low long-term IO*	*Excess cash & high long-term IO*	*Excess cash & low long-term IO*	*Excess cash & high capital expenditure & high long-term IO*	*Excess cash & high capital expenditure & low long-term IO*
L.Dev	0.038	-0.104***	-0.015	-0.067*	-0.059**	-0.071***	0.020	-0.095*
	[0.030]	[0.023]	[0.019]	[0.036]	[0.028]	[0.024]	[0.020]	[0.049]
L.RONA	0.817***	0.473***	0.747***	0.492***				
	[0.095]	[0.071]	[0.081]	[0.107]				
L.RONA (Industry adjusted)					0.782***	0.233***	0.449***	0.369
					[0.133]	[0.072]	[0.074]	[0.249]
Net Assets	0.013**	0.125***	0.000	0.104***	-0.026***	0.501***	-0.022*	0.218*
	[0.006]	[0.021]	[0.004]	[0.025]	[0.009]	[0.127]	[0.013]	[0.119]
PP&E	-0.040	-0.297**	-0.002	-0.316*	-0.153	-0.934*	0.030	-1.006**
	[0.045]	[0.142]	[0.018]	[0.167]	[0.095]	[0.480]	[0.049]	[0.433]
Firm Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	No	No	No	No
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.75	0.56	0.69	0.56	0.73	0.75	0.78	0.79
N	1282	876	784	462	1194	590	723	260

Table 13a. Long-term institutional ownership and cash holdings with corporate governance controls (robustness)

Table 13a reports the results of the effect of long-term institutional ownership on cash holdings and cash deviations with controlling for main corporate governance characteristics. Panel A replicates the models in Table 3. Panel B replicates the models in Table 4. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A

	Dependent Variable = Cash				
	(1)	(2)	(3)	(4)	(5)
	All firms	*Excess cash*	*Cash deficit*	*Large excess cash*	*Large cash deficit*
Long-term IO	-0.111***	-0.078***	0.000	-0.061**	-0.003
	(0.019)	(0.026)	(0.011)	(0.024)	(0.008)
CEO Duality	-0.013*	-0.001	-0.001	0.005	-0.001
	(0.007)	(0.010)	(0.003)	(0.011)	(0.003)
CEO Tenure	-0.001*	-0.001	0.000	-0.001	0.000
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
Independent NED in Board (%)	0.026	0.031*	0.002	0.036*	0.005
	(0.017)	(0.016)	(0.006)	(0.020)	(0.006)
Board Size	0.004	-0.014**	0.006**	-0.016*	0.008**
	(0.006)	(0.006)	(0.002)	(0.008)	(0.003)
Board Size2	-0.000	0.001**	-0.000**	0.001**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Institutional Ownership	0.090***	0.069**	0.008	0.052*	0.002
	(0.020)	(0.027)	(0.010)	(0.027)	(0.010)
Blockholding (5%)	0.012	-0.011	0.007	-0.005	0.008
	(0.017)	(0.020)	(0.006)	(0.022)	(0.007)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.34	0.70	0.48	0.70	0.56
N	7318	3026	4288	2425	2289

Panel B

Dependent Variable =	*Dev*	*|Dev|*	*ΔCash*	*ΔCash*	*ΔCash*
	(1)	(2)	(3)	(4)	(5)
	All firms	*All firms*	*All firms*	*Excess cash*	*Cash deficit*
Long-term IO	-0.111***	-0.045***	0.006	0.013	0.053***
	(0.019)	(0.013)	(0.011)	(0.025)	(0.012)
CEO Duality	-0.013*	-0.001	0.001	0.002	0.007
	(0.007)	(0.005)	(0.003)	(0.005)	(0.004)
CEO Tenure	-0.001*	-0.001	-0.000	-0.001*	0.001***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)
Independent NED in Board (%)	0.026	0.014	-0.004	-0.007	-0.014*
	(0.017)	(0.009)	(0.008)	(0.019)	(0.007)
Board Size	0.004	-0.009**	-0.004***	-0.009**	-0.005
	(0.006)	(0.003)	(0.001)	(0.004)	(0.003)
Board Size2	-0.000	0.001**	0.000*	0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Institutional Ownership	0.090***	0.034**	-0.004	0.005	-0.045***
	(0.020)	(0.013)	(0.012)	(0.025)	(0.015)
Blockholding (5%)	0.012	-0.004	-0.015	-0.056**	0.012
	(0.017)	(0.011)	(0.009)	(0.024)	(0.010)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.03	0.23	0.06	0.11	0.13
N	7318	7318	7008	2876	4128

Table 13b. Long-term institutional ownership and the value of cash holdings with corporate governance controls (robustness)

Table 13b reports the results of the effect of long-term institutional ownership on the value of cash holdings with controlling for main corporate governance characteristics. Panel A replicates the first and last columns of Table 6. Panel B replicates Columns (3), (4), (7) and (8) in Table 7, respectively. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A

	Dependent Variable = Excess Return			
	(1)	(2)	(3)	(4)
	All firms	*All firms*	*High long-term IO*	*Low long-term IO*
Long-term IO	0.185*			
	(0.100)			
Long-term IO X ΔCash/ME	0.979***			
	(0.328)			
Long-term IO (dummy)		-0.026		
		(0.057)		
Long-term IO (dummy) X ΔCash/ME		0.328		
		(0.221)		
ΔCash/ME	0.513*	1.004***	1.675***	0.793
	(0.241)	(0.324)	(0.368)	(0.452)
Institutional Ownership	-0.273**	-0.014	0.199**	-0.503**
	(0.098)	(0.105)	(0.090)	(0.214)
Blockholding (5%)	0.101	-0.018	-0.105	0.377
	(0.103)	(0.164)	(0.061)	(0.302)
CEO Duality	0.008	0.051	0.014	0.084
	(0.028)	(0.052)	(0.028)	(0.101)
CEO Tenure	0.002*	0.005*	0.003	0.003
	(0.001)	(0.002)	(0.003)	(0.009)
Independent NED in Board (%)	0.084	0.256	0.001	0.628**
	(0.077)	(0.150)	(0.091)	(0.279)
Board Size	-0.010	-0.055*	-0.021	-0.172
	(0.016)	(0.030)	(0.029)	(0.173)
Board Size^2	0.001	0.003	0.001	0.012
	(0.001)	(0.002)	(0.001)	(0.013)
Firm-level controls	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
R^2	0.10	0.12	0.24	0.13
N	4628	2187	1556	621

Panel B

Dependent Variable =	*RONA*		*RONA (Industry adjusted)*	
	(1)	(2)	(3)	(4)
	Excess cash & high capital expenditure			
L.Long-term IO	-0.082		-0.084*	
	(0.049)		(0.047)	
L.Long-term IO X L.Dev	0.473**		0.445**	
	(0.177)		(0.177)	
L.Long-term IO (dummy)		-0.028		-0.032
		(0.032)		(0.034)
L.Long-term IO (dummy) X L.Dev		0.169***		0.161***
		(0.046)		(0.047)
L.Institutional Ownership	0.021	0.035	0.028	0.036
	(0.054)	(0.072)	(0.054)	(0.071)
L.Blockholding (5%)	0.007	0.051	0.014	0.062
	(0.070)	(0.082)	(0.070)	(0.088)
L.CEO Duality	0.052	0.018	0.045	0.009
	(0.031)	(0.047)	(0.031)	(0.046)
L.CEO Tenure	0.000	0.001	-0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)
L.Independent NED in Board (%)	-0.011	-0.034	-0.019	-0.015
	(0.075)	(0.072)	(0.077)	(0.077)
L.Board Size	-0.045	-0.053	-0.037	-0.052
	(0.040)	(0.087)	(0.040)	(0.089)
L.Board Size^2	0.002	0.002	0.002	0.002
	(0.002)	(0.005)	(0.002)	(0.005)
Firm-level controls	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
R^2	0.83	0.87	0.83	0.86
N	1357	657	1357	657

Table 14a. Long-term institutional ownership and cash holdings considering the possible effect of the 2007-2010 financial crisis (robustness)

Table 14a reports the results of the effect of long-term institutional ownership on cash holdings considering the possible effect of the 2007-2010 financial crisis. Panel A replicates the models in Table 3 but with using a subsample that excludes years from 2007 to 2010. Panel B replicates the models in Table 3 but with using a subsample that only includes years from 2007 to 2010. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significant at 1%, 5%, and 10% levels, respectively.

Panel A (subsample excluding years from 2007 to 2010)

	Dependent Variable = Cash				
	(1)	(2)	(3)	(4)	(5)
	All firms	*Excess cash*	*Cash deficit*	*Large excess cash*	*Large cash deficit*
Long-term IO	-0.117***	-0.086***	-0.003	-0.074**	-0.009
	(0.020)	(0.025)	(0.010)	(0.025)	(0.009)
Institutional Ownership	0.088***	0.059**	0.009	0.042	0.008
	(0.018)	(0.025)	(0.009)	(0.028)	(0.008)
Blockholding (5%)	0.005	-0.017	0.010	-0.017	0.007
	(0.017)	(0.020)	(0.006)	(0.022)	(0.007)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.320	0.682	0.459	0.679	0.519
N	8107	3327	4779	2684	2624

Panel B (subsample only years from 2007 to 2010)

	Dependent Variable = Cash				
	(1)	(2)	(3)	(4)	(5)
	All firms	*Excess cash*	*Cash deficit*	*Large excess cash*	*Large cash deficit*
Long-term IO	-0.117**	-0.061	-0.016	-0.040	-0.016
	(0.026)	(0.033)	(0.013)	(0.052)	(0.015)
Institutional Ownership	0.089*	0.066	0.028	0.069	0.021
	(0.029)	(0.042)	(0.016)	(0.053)	(0.025)
Blockholding (5%)	0.026	0.001	0.013	0.005	0.013
	(0.030)	(0.036)	(0.008)	(0.033)	(0.010)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.298	0.687	0.381	0.696	0.485
N	3147	1337	1807	1099	1025

Table 14b. Long-term institutional ownership and cash deviations considering the possible effect of 2007-2010 financial crisis (robustness)

Table 14b reports the results of the effect of long-term institutional ownership on cash holdings considering the possible effect of the 2007-2010 financial crisis. Panel A replicates the models in Table 4 but with using a subsample that excludes years from 2007 to 2010. Panel B replicates the models in Table 4 but with using a subsample that only includes years from 2007 to 2010. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms and years. Firm-level controls and industry and year fixed effects are included in all regressions. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix B Table B1. ***, **, * denote statistical significant at 1%, 5%, and 10% levels, respectively.

Panel A (subsample excluding years from 2007 to 2010)

Dependent Variable =	*Dev*	*|Dev|*	*ΔCash*	*ΔCash*	*ΔCash*
	(1)	(2)	(3)	(4)	(5)
	All firms	*All firms*	*All firms*	*Excess cash*	*Cash deficit*
Long-term IO	-0.117***	-0.050***	-0.013	-0.028	0.041**
	(0.020)	(0.012)	(0.010)	(0.020)	(0.015)
Institutional Ownership	0.088***	0.032**	0.008	0.020	-0.032*
	(0.018)	(0.012)	(0.009)	(0.022)	(0.017)
Blockholding (5%)	0.005	-0.011	-0.026**	-0.075***	0.006
	(0.017)	(0.010)	(0.010)	(0.023)	(0.010)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.014	0.245	0.057	0.103	0.123
N	8107	8107	7544	3070	4473

Panel B (subsample only years from 2007 to 2010)

Dependent Variable =	*Dev*	*|Dev|*	*ΔCash*	*ΔCash*	*ΔCash*
	(1)	(2)	(3)	(4)	(5)
	All firms	*All firms*	*All firms*	*Excess cash*	*Cash deficit*
Long-term IO	-0.117**	-0.035	0.016	0.005	0.079**
	(0.026)	(0.019)	(0.024)	(0.031)	(0.021)
Institutional Ownership	0.089*	0.023	0.002	0.042	-0.061*
	(0.029)	(0.018)	(0.024)	(0.021)	(0.023)
Blockholding (5%)	0.026	-0.002	0.003	-0.003	-0.001
	(0.030)	(0.017)	(0.016)	(0.019)	(0.013)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.033	0.259	0.085	0.139	0.144
N	3147	3147	3091	1310	1779

Table 14c. Long-term institutional ownership and the value of cash holdings considering the possible effect of 2007-2010 financial crisis (robustness)

Table 14c reports the results of the effect of long-term institutional ownership on the value of cash holdings considering the possible effect of the 2007-2010 financial crisis. Panel A replicates first and last two models in Table 5 but with using a subsample that excludes years from 2007 to 2010. Panel B replicates first and last two models in Table 5 but with using a subsample that only includes years from 2007 to 2010. Standard errors (in brackets) are robust to arbitrary heteroscedasticity. All variables are truncated at the 1% and the 99% levels. Detailed definitions of variables are in Appendix Table B1. ***, **, * denote statistical significant at 1%, 5%, and 10% levels, respectively.

Panel A (subsample excluding years from 2007 to 2010)

	Dependent Variable = Excess Return			
	(1)	(2)	(3)	(4)
	All firms	*All firms*	*High long-term IO*	*Low long-term IO*
Long-term IO	0.055*			
	(0.029)			
Long-term IO X ΔCash/ME	0.580**			
	(0.280)			
Long-term IO (dummy)		0.082***		
		(0.027)		
Long-term IO (dummy) X ΔCash/ME		0.536***		
		(0.176)		
ΔCash/ME	0.645***	0.498**	1.493***	0.598*
	(0.161)	(0.200)	(0.413)	(0.276)
R^2	0.079	0.085	0.379	0.427
N	4500	2144	1302	500

Panel B (subsample only years from 2007 to 2010)

	Dependent Variable = Excess Return			
	(1)	(2)	(3)	(4)
	All firms	*All firms*	*High long-term IO*	*Low long-term IO*
Long-term IO	-0.180***			
	(0.054)			
Long-term IO X ΔCash/ME	1.745**			
	(0.757)			
Long-term IO (dummy)		-0.109***		
		(0.039)		
Long-term IO (dummy) X ΔCash/ME		0.669*		
		(0.370)		
ΔCash/ME	0.057	0.642*	1.984**	0.122
	(0.381)	(0.347)	(0.471)	(0.710)
R^2	0.075	0.079	0.530	0.486
N	3157	1426	810	354

Appendix C

Table C1. Definitions of variables

Dependent Variables	
Target Firm	A dummy variable equals 1 if firms are being targeted by at least one shareholder proposal at a given year, 0 for matched (non-target) firms.
CAR	The cumulative abnormal return around meeting date using the market model based on a 200-day period ending 21 days prior to the meeting date and benchmarking to the FTSE All Share index.
Defeated	A dummy variable equals 1 if a shareholder proposal has been put on vote but does not exceed the majority voting requirement, and zero otherwise.
Passed	A dummy variable equals 1 if a shareholder proposal has been put on vote and exceeds the majority voting requirement, and zero otherwise.
Dissent	A logistic transformation of dissent voting which is defined as the ratio of against and abstain votes to the total votes cast. In particular, Dissent is defined as the natural log of the dissent voting to one minus the dissent voting.
Against	A logistic transformation of against voting which is defined as the ratio of against votes to the total votes cast. In particular, Against is defined as the natural log of the against voting to one minus the against voting.
For	The ration of for (in favour) votes to the total votes cast.
Dissent (high)	A dummy variable equals 1 if a shareholder proposal has been put on vote and received dissent voting above the median of dissent voting of the sample, and zero otherwise.
For (high)	A dummy variable equals 1 if a shareholder proposal has been put on vote and received for voting above the median of for voting of the sample, and zero otherwise.
Passed & Withdrawn	A dummy variable equals 1 if a shareholder proposal has been put on vote and exceeds the majority voting requirement or if a shareholder proposal has been withdrawn before the general meeting date, and zero otherwise.
Independent Variables	
Long-term IO	The ratio of total outstanding shares held by all long-term institutional investors, with investment duration of at least eight quarters (two years).
Long-term IO (non-index)	The ratio of total outstanding shares held by all long-term institutional investors who do not invest in the studied firm as such firm being part of a particular stock market index.
Long-term IO (index)	The ratio of total outstanding shares held by all long-term institutional investors who invest in the studied firm as such firm being part of a particular stock market index.
Long-term IO (low turnover)	The ratio of total outstanding shares held by all long-term institutional investors who have a low turnover portfolio.
Long-term IO (high turnover)	The ratio of total outstanding shares held by all long-term institutional investors who have a high turnover portfolio.

Control Variables	
Institutional Ownership	The ratio of total outstanding shares held by all institutional investors.
Medium-term IO	The ratio of total outstanding shares held by all medium-term institutional investors, with investment duration of between four quarters and eight quarters.
Short-term IO	The ratio of total outstanding shares held by all short-term institutional investors, with investment duration of at most 4 quarters (1 year).
Blockholding (5%)	The ratio of total outstanding shares held by large investors (not necessarily institutional) with at least 5% shareholding.
Board Size	The total number of directors on the board.
Board Size (squared)	The square of the total number of directors on the board.
Non-executive Ratio	The ratio of non-executive directors to the total number of directors on the board.
Average Age Non-executive	The average age of non-executive directors on the board.
Board Female Ratio	The ratio of female directors to the total number of directors on the board.
CEO Duality	A dummy variable if the CEO is also the chairman of the board.
CEO Tenure	The number of years of the CEO in the position.
CEO Ownership	The ratio of total outstanding shares held by CEO.
CEO Ownership (squared)	The square of the ratio of total outstanding shares held by CEO.
Share Return	The stock price return adjusted to dividends in the year prior to the general meeting date.
Share Turnover	The ratio of total shares sold during the year prior to the general meeting date to the total number of outstanding shares.
Total Assets	The natural log of the book value of total assets.
Leverage	The ratio of short and long debt to the book value of total assets.
ROA	The ratio of net income to the book value of total assets.
Capital Expenditure	The ratio of capital expenditure to the book value of total assets.
R&D	The ratio of research and development to the book value of total assets.
EGM	A dummy variable equals 1 if a shareholder proposal has been submitted to an emergency general meeting.
GG proposal	A dummy variable equals 1 if the issue of the shareholder proposal is related to the board (election, removal, other) or shareholder rights.
CSR proposal	A dummy variable equals 1 if the issue of the shareholder proposal is related to social matters (donations, etc.), the firm's workforce, and environmental issues.

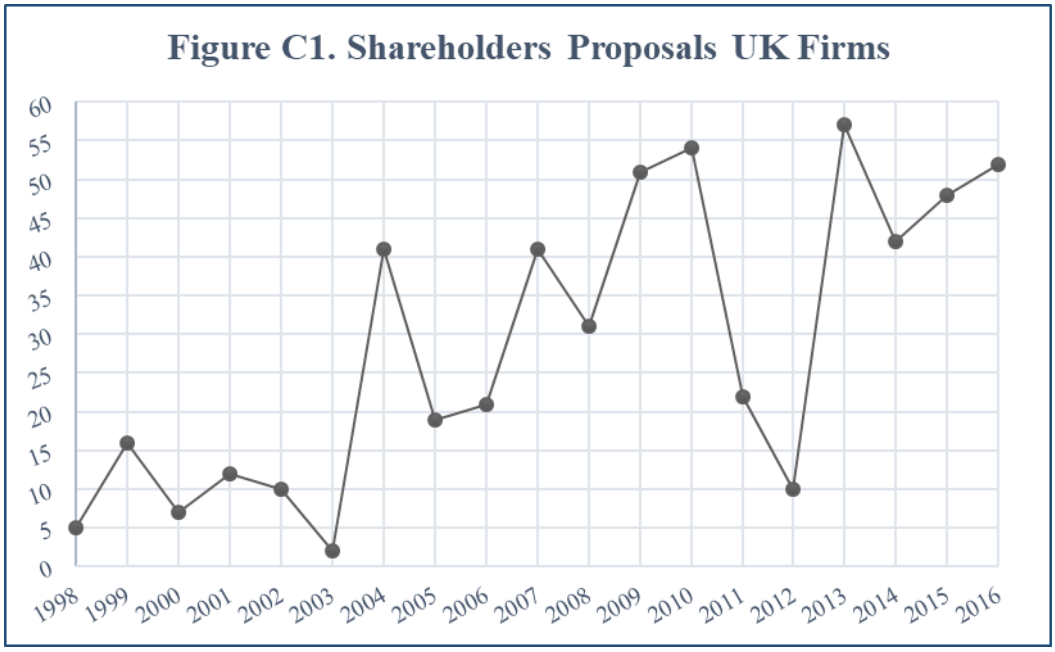
Figure C1. Shareholders Proposals UK Firms
60
55
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35
30
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0
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1999
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Figure C2. For and Against Voting on Shareholders Proposals

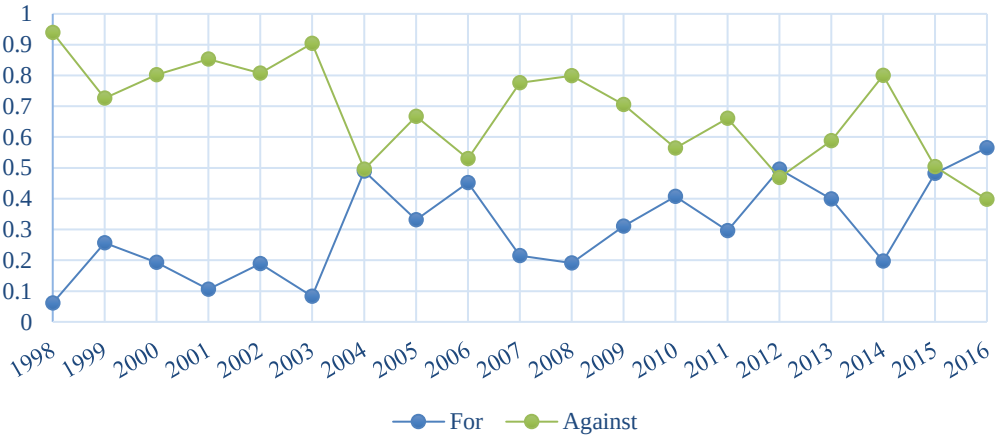

Figure C3. Voting Outcomes of Shareholders Proposals

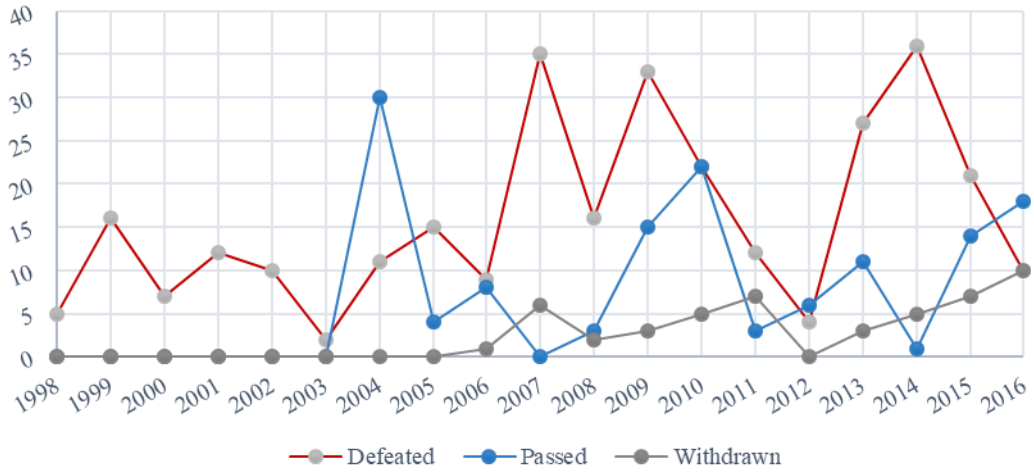

Table 8. Different proxies for voting outcome (robustness)

This table presents the results of logistic and OLS regressions examining the effect of long-term institutional ownership on voting outcome of shareholder proposals using alternative measures for voting outcome. Columns (1) – (3) show the logistics estimations and columns (4) and (5) show the OLS estimations. Dissent (high) is a dummy variable that equals 1 if the dissent voting of a shareholder proposal is above the median dissent voting of the sample, zero otherwise. For (high) is a dummy variable that equals 1 if the for voting of a shareholder proposal is above the median for voting of the sample, zero otherwise. Passed & Withdrawn is a dummy variable that equals 1 if the shareholder proposal is put to vote and does exceed the majority voting requirement or if the shareholder proposal has been withdrawn before the general meeting date, zero otherwise. Against is the logistic transformation of the ratio of against votes to the total votes cast. For is the ratio of for votes to the total votes cast. Detailed definitions of the remaining variables are reported in Appendix C Table C1. Standard errors are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

Dependent variable =	*Dissent (high)*	*For (high)*	*Passed & Withdrawn*	*Against*	*For*
	(1)	(2)	(3)	(4)	(5)
Long-term IO	-16.014**	13.326***	8.820**	-2.864**	0.653***
	[7.959]	[4.727]	[3.628]	[1.344]	[0.200]
Institutional Ownership	17.249**	-10.715***	-7.602***	1.542	-0.459**
	[7.575]	[4.141]	[2.858]	[1.273]	[0.181]
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes	Yes	Yes
R^2 (Pseudo)	(0.61)	(0.65)	(0.33)	0.36	0.54
N	322	322	322	222	223

Table 9a. Propensity score matching and target analysis (robustness)

This table presents the difference of long-term institutional ownership between target firms and matched control firms using a propensity score matching approach. Firms have been matched using all firm-level independent variables in Equation (1) except ownership variables. A target firm is defined as one at which at least one shareholder proposal was submitted in a particular year. The control firms' subsample includes all UK listed firms in LSE which have not been targeted by shareholder proposals. We use five different matching algorithms: one nearest neighbour NN(1), three nearest neighbours NN(3), five nearest neighbours NN(5), Radius and Kernel. All matching algorithms impose common support and a caliper of 0.01. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

		Target Firms	Control Firms	Diff.	SE	*t*-statistics
Matching algorithm		(1)	(2)	(3)	(4)	(5)
NN(1)	ATT	0.322	0.421	-0.097	0.035	-2.80***
NN(3)	ATT	0.322	0.425	-0.103	0.028	-3.66***
NN(5)	ATT	0.322	0.434	-0.112	0.027	-4.17***
Radius	ATT	0.322	0.427	-0.105	0.023	-4.55***
Kernel	ATT	0.322	0.424	-0.102	0.023	-4.46***

Table 9b. Propensity score matching and cumulative abnormal return (robustness)

This table presents the difference of cumulative abnormal return around shareholder proposal meetings between target firms with different proportions of long-term institutional ownership. High (low) long-term IO firms are firms with above (below) the median of long-term institutional ownership. Firms have been matched using all firm-level independent variables in Equation (2) except ownership variables. We use eight different windows to estimate the cumulative abnormal return; [-1,+1],...,[-10,+10].We use three different matching algorithms: one nearest neighbour NN(1), Radius and Kernel. All matching algorithms impose common support and a caliper of 0.01. Detailed definitions of the remaining variables are reported in Appendix C Table C1. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

		High long-term IO Firms	Low long-term IO Firms	Diff.	SE	*t*-statistics
Matching algorithm		(1)	(2)	(3)	(4)	(5)
CAR [-1,+1]						
NN(1)	ATT	-0.695	-4.921	4.226	2.458	1.72*
Radius	ATT	-0.695	-4.882	4.187	2.000	2.09**
Kernel	ATT	-1.655	-5.513	3.857	1.544	2.50**
CAR [-1,0]						
NN(1)	ATT	0.323	-2.502	2.825	1.843	1.53
Radius	ATT	0.323	-2.296	2.619	1.57	1.67*
Kernel	ATT	-0.441	-3.546	3.105	1.33	2.33**
CAR [0,+1]						
NN(1)	ATT	-1.459	-6.411	4.952	4.765	1.04
Radius	ATT	-1.459	-6.411	4.952	2.409	2.06**
Kernel	ATT	-0.778	-4.836	4.058	1.359	2.99***
CAR [-2,+2]						
NN(1)	ATT	-2.465	-7.158	4.693	5.356	0.88
Radius	ATT	-2.465	-7.227	4.762	2.896	1.64*
Kernel	ATT	-2.476	-13.1	10.627	2.637	4.03***
CAR [-1,+5]						
NN(1)	ATT	-1.646	-4.460	2.815	7.957	0.35
Radius	ATT	-1.646	-4.492	2.846	4.353	0.65
Kernel	ATT	-1.670	-14.36	12.69	2.875	4.42***
CAR [-1,+7]						
NN(1)	ATT	-2.696	-5.717	3.022	7.201	0.42
Radius	ATT	-2.696	-5.779	3.083	4.149	0.74
Kernel	ATT	-3.279	-15.28	12.00	3.018	3.98***
CAR [-5,+5]						
NN(1)	ATT	-0.404	1.122	-1.526	8.002	-0.19
Radius	ATT	-0.404	1.328	-1.732	3.764	-0.46
Kernel	ATT	-2.428	-10.75	8.325	2.945	2.83***
CAR [-10,+10]						
NN(1)	ATT	-0.329	-7.465	7.137	4.907	1.45
Radius	ATT	-0.329	-7.694	7.362	3.796	1.94*
Kernel	ATT	-1.260	-14.587	13.33	3.537	3.77***

Table 9c. Propensity score matching and voting outcome (robustness)

This table presents the difference of voting outcomes of shareholder proposals between target firms with different proportions of long-term institutional ownership. High (low) long-term IO firms are firms with above (below) the median of long-term institutional ownership. Firms have been matched using all firm-level independent variables in Equation (3) except ownership variables. We use four different proxies for voting outcome: Dissent (For) which is defined as the ratio of against and abstain (for) votes to the total votes cast, and Defeated (Passed) is a dummy variable that equals 1 if the shareholder proposal is put to vote and does not (does) exceed the majority voting requirement, zero otherwise. We use five different matching algorithms: one nearest neighbour NN(1), three nearest neighbours NN(3), five nearest neighbours NN(5), Radius and Kernel. All matching algorithms impose common support and a caliper of 0.01. Detailed definitions of remaining variables are reported in Appendix C Table C1. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

		High long-term IO Firms	Low long-term IO Firms	Diff.	SE	*t*-statistics
Matching algorithm		(1)	(2)	(3)	(4)	(5)
Dissent						
NN(1)	ATT	0.633	0.881	-0.249	0.086	-2.90***
NN(3)	ATT	0.633	0.875	-0.242	0.071	-3.41***
NN(5)	ATT	0.633	0.873	-0.240	0.063	-3.75***
Radius	ATT	0.633	0.872	-0.239	0.071	-3.43***
Kernel	ATT	0.618	0.901	-0.283	0.069	-4.12***
Defeated						
NN(1)	ATT	0.609	0.812	-0.203	0.186	-1.09
NN(3)	ATT	0.609	0.826	-0.217	0.154	-1.41
NN(5)	ATT	0.609	0.822	-0.214	0.156	-1.37
Radius	ATT	0.609	0.821	-0.212	0.152	-1.40
Kernel	ATT	0.614	0.762	-0.148	0.134	-1.10
For						
NN(1)	ATT	0.368	0.119	0.250	0.056	2.91***
NN(3)	ATT	0.368	0.125	0.243	0.083	2.93***
NN(5)	ATT	0.368	0.124	0.245	0.082	2.99***
Radius	ATT	0.368	0.121	0.248	0.067	3.70***
Kernel	ATT	0.362	0.103	0.259	0.071	3.63***
Passed						
NN(1)	ATT	0.232	0.101	0.130	0.126	1.03
NN(3)	ATT	0.232	0.101	0.130	0.084	1.55
NN(5)	ATT	0.232	0.101	0.130	0.075	1.73*
Radius	ATT	0.232	0.103	0.127	0.083	1.55
Kernel	ATT	0.196	0.045	0.151	0.099	1.52

Table 10a. Cumulative abnormal returns and the heterogeneous effect of long-term institutional ownership (robustness)

This table presents the results of OLS regressions examining the heterogeneous effect of long-term institutional ownership on the cumulative abnormal returns. Panel A shows the results of indexer and non-indexer long-term institutional investors, and Panel B shows the results of long-term institutional investors with low and high portfolio turnover. Eight different event windows are used to calculate CAR. A market model based on a 200-day period ending 21 days prior to the general meeting date has been used to calculate CAR. The FTSE All Share index has been used for benchmarking. Detailed definitions of the remaining variables are reported in Appendix C Table C1. Standard errors are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

	Dependent variable = Cumulative abnormal returns							
	[-1,+1]	[-1,0]	[0,+1]	[-2,+2]	[-1,+5]	[-1,+7]	[-5,+5]	[-10,+10]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A				
Long-term IO (non-indexer)	20.352***	10.398**	14.368***	17.778	15.237	27.325**	10.112	44.016***
	[7.176]	[4.545]	[5.323]	[13.876]	[9.199]	[12.140]	[10.449]	[16.239]
Long-term IO (indexer)	35.236	-8.569	-2.107	109.361	216.737**	86.250	351.001***	218.627
	[63.619]	[42.365]	[55.909]	[116.642]	[97.298]	[109.502]	[128.364]	[168.952]
Institutional Ownership (non-indexer)	-11.149*	-4.505	-11.214**	-1.908	-10.070	-15.462	-6.093	-20.917
	[6.346]	[2.765]	[4.716]	[12.951]	[9.080]	[11.532]	[9.910]	[13.344]
Institutional Ownership (indexer)	-22.084	-3.089	10.628	-112.564	-199.904**	-94.011	-328.170**	-252.119
	[64.554]	[41.075]	[56.931]	[114.171]	[93.739]	[103.622]	[128.396]	[159.537]
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.41	0.43	0.24	0.39	0.48	0.48	0.46	0.40
N	296	296	296	296	296	296	296	296

Panel B

Long-term IO (high portfolio turnover)	30.147***	14.580***	13.469**	24.437**	39.007***	39.275***	57.533***	65.854***
	[5.781]	[4.825]	[6.409]	[10.232]	[9.523]	[9.971]	[15.955]	[13.905]
Long-term IO (low portfolio turnover)	0.559	-2.463	9.520	7.783	-3.926	-1.601	-26.707*	16.023
	[12.617]	[7.171]	[10.501]	[27.878]	[14.891]	[19.159]	[15.394]	[26.684]
Institutional Ownership (high portfolio turnover)	-12.198**	-5.730	-5.510	-2.970	-15.932*	-16.997*	-26.883*	-27.798**
	[4.904]	[4.556]	[5.612]	[9.071]	[8.415]	[9.866]	[13.942]	[13.479]
Institutional Ownership (low portfolio turnover)	-0.585	3.189	-11.085	-3.967	0.012	-0.928	22.051	-2.488
	[11.750]	[6.521]	[9.774]	[25.896]	[14.762]	[18.378]	[16.708]	[23.236]
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.44	0.44	0.24	0.38	0.49	0.48	0.48	0.41
N	296	296	296	296	296	296	296	296

Table 10b. Voting outcome and the heterogeneous effect of long-term institutional ownership (robustness)

This table presents the results of logistic and OLS regressions examining the heterogeneous effect of long-term institutional ownership on the voting outcome of shareholder proposals. Panel A shows the results of indexer and non-indexer long-term institutional investors, and Panel B shows the results of long-term institutional investors with low and high portfolio turnover. Columns (1) and (2) show the logistics estimations and Column (3) shows the OLS estimations. Defeated (Passed) is a dummy variable that equals 1 if the shareholder proposal is put to vote and does not (does) exceed the majority voting requirement, zero otherwise. Dissent is the logistic transformation of the ratio of against and dissent votes to the total votes cast. Detailed definitions of the remaining variables are reported in Appendix C Table C1. Standard errors are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

Dependent variable =	*Defeated*	*Passed*	*Dissent*
	(1)	(2)	(3)
		Panel A	
Long-term IO (non-indexer)	-7.554**	20.253***	-3.696***
	[3.570]	[4.588]	[1.089]
Long-term IO (indexer)	-14.577	-3.464	23.904**
	[33.691]	[51.297]	[11.646]
Institutional Ownership (non-indexer)	4.809	-17.681***	3.075***
	[2.958]	[4.471]	[1.135]
Institutional Ownership (indexer)	11.210	-11.381	-28.655**
	[34.262]	[55.150]	[13.691]
Firm-level controls	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes
R^2 (Pseudo)	(0.39)	(0.41)	0.48
N	322	322	222
		Panel B	
Long-term IO (high portfolio turnover)	-6.092	18.391**	1.057
	[4.370]	[7.676]	[2.728]
Long-term IO (low portfolio turnover)	-15.976***	19.058***	-5.851**
	[5.602]	[6.446]	[2.788]
Institutional Ownership (high portfolio turnover)	2.687	-19.781**	-1.498
	[3.113]	[7.766]	[2.820]
Institutional Ownership (low portfolio turnover)	12.477**	-14.185**	4.073*
	[4.985]	[5.795]	[2.212]
Firm-level controls	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes
R^2 (Pseudo)	(0.41)	(0.43)	0.48
N	322	322	222

Table 11a. Target analysis: pressure-sensitive and pressure-resistant institutional ownership (robustness)

This table presents the results of logistic regressions examining the effect of investment horizon of pressure-sensitive and pressure-resistant institutional investors on the probability of a firm being targeted by shareholder proposals. The dependent variable target firm is a dummy variable that equals 1 if firms are being targeted by at least one shareholder proposal at a given year, 0 for matched (non-target) firms. Columns (1) – (8) show the results using different proxies for size in our matching procedure, Market-to-book (MTB), total assets, revenue, and market capitalization. Columns (9) and (10) replicate the estimation while pooling all matched firms with the four different size proxies in one regression. Detailed definitions of the remaining variables are reported in Appendix C Table C1. Standard errors are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

	Dependent variable = Target Firm									
	MTB		Total Assets		Revenue		Market Cap.		All Matched	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Pressure-Sensitive IO	-1.282		-1.742		-2.033		-3.029		-1.229	
	[2.575]		[2.865]		[2.798]		[3.037]		[2.747]	
Pressure-Resistant IO	-3.141*		-3.555*		-3.343*		-3.308*		-2.980*	
	[1.729]		[1.860]		[1.985]		[1.830]		[1.760]	
Pressure-Sensitive IO (long-term)		4.001		-4.577		-12.060*		-9.583		-5.166
		[6.028]		[7.466]		[7.287]		[8.247]		[5.605]
Pressure-Resistant IO (long-term)		-3.929**		-3.238*		-3.174		-3.451*		-2.951
		[1.901]		[1.937]		[2.146]		[1.942]		[1.912]
Pressure-Sensitive IO (medium-term)		-9.382		-11.929		0.968		-8.219		-7.161
		[6.440]		[9.603]		[6.136]		[7.825]		[6.865]
Pressure-Resistant IO (medium-term)		-3.404		-7.890**		-0.297		-4.626		-2.534
		[4.687]		[3.527]		[4.905]		[4.377]		[3.053]
Pressure-Sensitive IO (short-term)		-1.192		6.508		10.934		-0.353		3.098
		[2.834]		[8.661]		[13.893]		[2.867]		[2.582]
Pressure-Resistant IO (short-term)		-0.193		2.477		-1.805		2.054		-0.502
		[5.198]		[3.987]		[4.682]		[5.568]		[3.908]
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.22	0.23	0.22	0.24	0.25	0.27	0.24	0.25	0.19	0.20
N	192	192	200	200	202	202	202	202	499	499

Table 11b. Cumulative abnormal returns: pressure-sensitive and pressure-resistant institutional ownership (robustness)

This table presents the results of OLS regressions examining the effect of pressure-sensitive and pressure-resistant institutional ownership on the cumulative abnormal returns. Panel A presents the effect of total ownership by pressure-sensitive and pressure-resistant institutional investors, and Panel B presents the role of the investment horizon of pressure-sensitive and pressure-resistant institutional ownership. Eight different event windows are used to calculate CAR. A market model based on a 200-day period ending 21 days prior to the general meeting date has been used to calculate CAR. The FTSE All Share index has been used for benchmarking. Detailed definitions of the remaining variables are reported in Appendix C Table C1. Standard errors are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

	Dependent variable = Cumulative abnormal returns							
	[-1,+1]	[-1,0]	[0,+1]	[-2,+2]	[-1,+5]	[-1,+7]	[-5,+5]	[-10,+10]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A				
Pressure-Sensitive IO	-12.519	4.761	-18.144	21.508	-3.720	-6.266	-10.085	-2.648
	[25.631]	[8.455]	[20.159]	[37.273]	[34.694]	[40.192]	[37.500]	[42.297]
Pressure-Resistant IO	-0.343	-5.328	1.859	-1.635	4.232	0.837	-7.793	-8.416
	[7.951]	[5.452]	[6.656]	[9.661]	[11.242]	[13.442]	[14.358]	[18.107]
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.39	0.52	0.20	0.43	0.42	0.42	0.40	0.31
N	296	296	296	296	296	296	296	296

				Panel B				
Pressure-Sensitive IO (long-term)	-128.505**	-20.361	-108.106**	-212.772***	-182.456***	-233.390***	-263.171***	-236.319**
	[50.143]	[20.313]	[49.187]	[58.374]	[62.609]	[69.771]	[58.161]	[90.859]
Pressure-Resistant IO (long-term)	50.977***	8.902	30.496**	77.054***	82.312***	116.767***	123.145***	146.579***
	[12.379]	[11.161]	[13.301]	[22.396]	[18.761]	[23.343]	[19.305]	[40.455]
Pressure-Sensitive IO	7.976	7.976	-0.407	55.736***	24.984*	29.993**	31.140**	32.935
	[10.918]	[10.171]	[8.175]	[13.098]	[14.437]	[13.308]	[14.694]	[25.383]
Pressure-Resistant IO	-29.148***	-10.503	-13.205	-43.889**	-44.018**	-69.375***	-80.657***	-100.486***
	[10.254]	[8.129]	[10.586]	[18.361]	[18.237]	[22.958]	[17.224]	[37.245]
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.54	0.53	0.32	0.59	0.54	0.59	0.56	0.43
N	296	296	296	296	296	296	296	296

Table 11c. Voting outcome: pressure-sensitive and pressure-resistant institutional ownership (robustness)

This table presents the results of logistic and OLS regressions examining the effect of pressure-sensitive and pressure-resistant institutional ownership on the voting outcome of shareholder proposals. Panel A presents the effect of total ownership by pressure-sensitive and pressure-resistant institutional investors, and Panel B presents the role of the investment horizon of pressure-sensitive and pressure-resistant institutional ownership. Columns (1) and (2) show the logistics estimations and Column (3) shows the OLS estimations. Defeated (Passed) is a dummy variable that equals 1 if the shareholder proposal is put to vote and does not (does) exceed the majority voting requirement, zero otherwise. Dissent is the logistic transformation of the ratio of against and dissent votes to the total votes cast. Detailed definitions of remaining variables are reported in Appendix C Table C1. Standard errors are robust to arbitrary heteroscedasticity and allow for serial correlation through clustering by firms. *, ** and *** indicate statistical significance of t-test at 10%, 5% and 1% level, respectively.

Dependent variable =	*Defeated*	*Passed*	*Dissent*
	(1)	(2)	(3)
		Panel A	
Pressure-Sensitive IO	43.625**	-51.157***	2.333
	[17.640]	[18.223]	[2.889]
Pressure-Resistant IO	-2.857	4.895	-1.171
	[3.601]	[3.538]	[1.529]
Firm-level controls	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes
R^2 (Pseudo)	(0.46)	(0.38)	0.46
N	322	322	222
		Panel B	
Pressure-Sensitive IO (long-term)	23.944	-23.465	-2.851
	[22.613]	[43.462]	[5.847]
Pressure-Resistant IO (long-term)	-17.584**	21.227*	-6.630**
	[7.211]	[12.742]	[3.173]
Pressure-Sensitive IO	30.717**	-28.682	3.515
	[15.198]	[38.855]	[2.422]
Pressure-Resistant IO	9.633*	-9.665	4.458
	[5.369]	[7.675]	[3.372]
Firm-level controls	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes
R^2 (Pseudo)	(0.49)	(0.33)	0.46
N	322	322	222

Table 12a. Target analysis: foreign and domestic institutional ownership (robustness)

This table presents the results of logistic regressions examining the effect of investment horizon of foreign and domestic institutional investors on the probability of firm being targeted by shareholder proposals. The dependent variable target firm is a dummy variable equals 1 if firms being targeted by at least one shareholder proposal at a given year, 0 for matched (non-target) firms. Detailed definitions of variables are reported in Table C1 in Appendix C. Columns (1) - (8) shows the results using different proxies for size in our matching procedure, Market-to-book (MTB), total assets, revenue, and market capitalization. Columns (9) and (10) replicate the estimation with pooling all matched firms with the four different size proxies in one regression. Standard errors (in brackets) are robust clustering by firm level. *, ** and *** indicate statistical significant of t-test at 10%, 5% and 1% level, respectively.

	Dependent variable = Target Firm									
	MTB		Total Assets		Revenue		Market Cap.		All Matched	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Foreign IO	1.021		1.951		0.466		-0.884		1.410	
	[1.645]		[1.896]		[1.564]		[1.689]		[1.399]	
Domestic IO	-3.081***		-2.776***		-2.601**		-2.995***		-2.952***	
	[1.048]		[1.015]		[1.182]		[1.081]		[1.105]	
Foreign IO (long-term)		1.480		2.302		-1.331		-1.455		0.826
		[2.061]		[3.035]		[2.235]		[2.234]		[1.832]
Domestic IO (long-term)		-2.749***		-2.869**		-2.733**		-2.825**		-2.858**
		[1.047]		[1.140]		[1.297]		[1.165]		[1.147]
Foreign IO (medium-term)		-3.896		-2.227		2.358		2.807		1.420
		[4.271]		[4.754]		[5.036]		[5.697]		[3.546]
Domestic IO (medium-term)		-5.115		-6.126**		-1.545		-6.616**		-4.146*
		[3.309]		[3.093]		[3.572]		[2.756]		[2.513]
Foreign IO (short-term)		5.769*		9.600**		5.536		0.870		5.597**
		[3.424]		[4.392]		[4.995]		[3.801]		[2.834]
Domestic IO (short-term)		-7.765*		0.165		-3.976		-2.496		-4.740
		[4.595]		[3.897]		[3.283]		[4.103]		[4.639]
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.25	0.27	0.25	0.27	0.26	0.28	0.27	0.27	0.22	0.23
N	192	192	200	200	202	202	202	202	499	499

Table 12b. Target analysis: foreign and domestic institutional ownership (robustness)

This table presents the results of OLS regressions examining the effect of foreign and domestic institutional ownership on the cumulative abnormal returns. Panel A presents the effect of total ownership by foreign and domestic institutional investors, and Panel B presents the role of investment horizon of foreign and domestic institutional ownership. Eight different event widows are used to calculate CAR. Market model based on 200-day period ending 21 days prior to the general meeting date has been used to calculate CAR. FTSE All share index has been used for benchmarking. Detailed definitions of variables are reported in Table C1 in Appendix C. Standard errors (in brackets) are robust clustering by firm level. *, ** and *** indicate statistical significant of t-test at 10%, 5% and 1% level, respectively.

	Dependent variable = Cumulative abnormal returns							
	[-1,+1]	[-1,0]	[0,+1]	[-2,+2]	[-1,+5]	[-1,+7]	[-5,+5]	[-10,+10]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A				
Foreign IO	-1.187	-0.477	-5.244	-5.044	-4.980	-9.555	-1.288	-20.912
	[7.177]	[4.430]	[5.936]	[8.398]	[7.468]	[11.400]	[10.505]	[18.663]
Domestic IO	4.252	3.164	1.104	9.544*	2.935	4.975	4.462	19.494***
	[4.354]	[2.772]	[3.612]	[5.133]	[5.896]	[5.432]	[8.554]	[7.236]
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.33	0.41	0.20	0.36	0.42	0.44	0.40	0.38
N.	296	296	296	296	296	296	296	296

				Panel B				
Foreign IO (long-term)	19.064*	11.820	18.472**	-1.889	-4.963	14.253	-25.175	50.951*
	[9.588]	[7.460]	[8.537]	[14.403]	[13.659]	[18.769]	[19.086]	[27.450]
Domestic IO (long-term)	16.894**	5.524	6.605	18.982	30.532**	23.189*	45.016***	33.112**
	[8.179]	[4.661]	[5.633]	[15.562]	[12.758]	[13.159]	[15.839]	[14.315]
Foreign IO	-10.520*	-6.235	-14.232**	-4.238	-2.751	-16.594	10.651	-45.787**
	[5.527]	[4.173]	[5.540]	[11.540]	[9.568]	[12.611]	[11.956]	[17.919]
Domestic IO	-8.690	-1.079	-3.977	-4.955	-20.383	-12.768	-29.883*	-5.900
	[7.457]	[3.768]	[5.123]	[14.661]	[12.224]	[12.426]	[15.013]	[11.818]
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.40	0.43	0.24	0.38	0.47	0.47	0.47	0.44
N	296	296	296	296	296	296	296	296

Table 12c. Voting outcome: foreign and domestic institutional ownership (robustness)

This table presents the results of logistic and OLS regressions examining the effect of foreign and domestic institutional ownership on voting outcome of shareholder proposals. Panel A presents the effect of total ownership by foreign and domestic institutional investors, and Panel B presents the role of investment horizon of foreign and domestic institutional ownership. Columns (1) and (2) shows the logistics estimations and column (3) shows the OLS estimations. Defeated (passed) is a dummy variable equals 1 if the shareholder proposal is put to vote and does not (does) exceed the majority voting requirement, zero otherwise. Dissent is the logistic transformation of the ratio of against and dissent votes to the total vote cast. Detailed definitions of variables are reported in Table C1 in Appendix C. Standard errors (in brackets) are robust clustering by firm level. *, ** and *** indicate statistical significant of t-test at 10%, 5% and 1% level, respectively.

Dependent variable =	*Defeated*	*Passed*	*Dissent*
	(1)	(2)	(3)
		Panel A	
Foreign IO	-0.865	-1.235	0.380
	[2.041]	[3.800]	[2.375]
Domestic IO	0.119	-2.059	1.625
	[1.056]	[1.561]	[1.373]
Firm-level controls	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes
R^2 (Pseudo)	(0.34)	(0.27)	0.46
N	322	322	222
		Panel B	
Foreign IO (long-term)	-1.809	21.553**	-0.440
	[4.523]	[8.759]	[3.068]
Domestic IO (long-term)	-10.752***	12.721***	-2.950*
	[3.365]	[4.031]	[1.485]
Foreign IO	-0.103	-15.517	0.380
	[3.828]	[9.493]	[2.375]
Domestic IO	8.117***	-11.986***	1.625
	[2.874]	[3.902]	[1.373]
Firm-level controls	Yes	Yes	Yes
Proposal-level controls	Yes	Yes	Yes
R^2 (Pseudo)	(0.39)	(0.41)	0.46
N	322	322	222

Table C2. Cumulative abnormal returns around general meetings with only one shareholder proposal

This table shows the mean cumulative abnormal returns around dates of general meetings with only one shareholder proposal by voting outcome of proposals, related issue of shareholder proposals, and meeting type. Market model based on 200-day period ending 21 days prior to the general meeting date has been used to calculate CAR. FTSE All share index has been used for benchmarking. The cross-sectional t-test has been used to test the significance of mean differences. *, ** and *** indicate statistical significant of t-test at 10%, 5% and 1% level, respectively.

Panel A	***CAR***							
	One-proposal meetings							
	[-1,+1]	**[-1,0]**	**[0,+1]**	**[-2,+2]**	**[-1,+5]**	**[-1,+7]**	**[-5,+5]**	**[-10,+10]**
Defeated proposal	-1.457*	-1.293*	-1.170*	0.845	-0.00219	-0.348	-0.443	-1.962
	(-1.92)	(-2.02)	(-1.75)	(0.72)	(-0.00)	(-0.30)	(-0.32)	(-1.02)
N	*34*	*34*	*34*	*34*	*34*	*34*	*34*	*34*
Passed proposal	-0.190	0.201	-2.565	-3.670	-0.966	-1.076	6.235	5.905
	(-0.13)	(0.15)	(-0.83)	(-1.14)	(-0.21)	(-0.25)	(1.36)	(1.53)
N	*13*	*13*	*13*	*13*	*13*	*13*	*13*	*13*
CG proposal	-2.119	-1.860	-1.142	0.368	0.953	0.203	0.460	-1.163
	(-1.59)	(-1.63)	(-0.91)	(0.19)	(0.50)	(0.10)	(0.19)	(-0.35)
N	*22*	*22*	*22*	*22*	*22*	*22*	*22*	*22*
CSR proposal	-0.0875	-0.292	-0.594	0.409	0.369	0.351	0.196	1.084
	(-0.16)	(-0.65)	(-1.20)	(0.58)	(0.45)	(0.40)	(0.16)	(0.60)
N	*22*	*22*	*22*	*22*	*22*	*22*	*22*	*22*
CG proposal (elect)	-3.532**	-2.518	-2.769*	0.0949	1.399	-0.648	4.956	2.046
	(-2.63)	(-1.78)	(-2.01)	(0.04)	(0.51)	(-0.24)	(1.34)	(0.48)
N	*10*	*10*	*10*	*10*	*10*	*10*	*10*	*10*
CG proposal (remove)	-1.012	-1.932	-1.266	1.101	2.022	1.893	-2.960	-1.830
	(-0.24)	(-0.56)	(-0.32)	(0.18)	(0.40)	(0.35)	(-0.45)	(-0.21)
N	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*6*
EGM	-2.012	-0.896	-5.936	1.612	-3.238	-3.896	10.98	0.587
	(-1.01)	(-0.56)	(-1.16)	(0.23)	(-0.38)	(-0.48)	(1.41)	(0.08)
N	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*
Panel B	***Defeated proposal***				***Not-Defeated proposal***			
	[-1,+1]	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**	**[-1,+1]**	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**

CG proposal	-3.239*	1.310	-0.743	-4.276	0.279	-1.651	3.039	5.506
	(-2.09)	(0.50)	(-0.25)	(-1.04)	(0.11)	(-0.67)	(0.66)	(1.02)
N	*15*	*15*	*15*	*15*	*7*	*7*	*7*	*7*
CSR proposal	-0.130	0.504	-0.395	0.259	0.0268	0.156	1.773	3.285
	(-0.28)	(0.74)	(-0.38)	(0.20)	(0.02)	(0.08)	(0.47)	(0.55)
N	*16*	*16*	*16*	*16*	*6*	*6*	*6*	*6*
CG proposal (elect)	-2.296	2.778	5.469	2.160	-8.477*	-10.64***	2.908	1.591
	(-1.73)	(1.35)	(1.51)	(0.47)	(-8.01)	(-67.05)	(0.19)	(0.10)
N	*8*	*8*	*8*	*8*	*2*	*2*	*2*	*2*
CG proposal (remove)	-7.172	-1.424	-11.81	-15.88	5.149*	3.626*	5.893	12.22
	(-1.05)	(-0.10)	(-1.32)	(-1.46)	(2.92)	(3.04)	(0.79)	(1.40)
N	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
EGM	-4.279	10.06	2.612	-12.04	1.011	-9.657	22.13	17.43*
	(-1.77)	(2.01)	(0.40)	(-1.43)	(0.36)	(-0.70)	(1.47)	(3.06)
N	*4*	*4*	*4*	*4*	*3*	*3*	*3*	*3*
Panel C		***EGM***				***AGM***		
	[-1,+1]	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**	**[-1,+1]**	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**
CG proposal	-1.638	8.085*	4.663	-1.701	-2.300	-2.526	-1.116	-0.962
	(-0.71)	(2.35)	(0.87)	(-0.19)	(-1.39)	(-1.33)	(-0.41)	(-0.28)
N	*6*	*6*	*6*	*6*	*16*	*16*	*16*	*16*
CSR proposal	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-
CG proposal (elect)	-4.204	4.973	8.446	-8.023	-3.364*	-1.125	4.084	4.563
	(-1.36)	(0.87)	(0.66)	(-0.80)	(-2.11)	(-0.42)	(1.04)	(0.98)
N	*2*	*2*	*2*	*2*	*8*	*8*	*8*	*8*
CG proposal (remove)	2.665	10.52	6.441	13.03	-4.688	-8.318	-12.36	-16.69
	(1.99)	(1.62)	(0.88)	(1.61)	(-0.55)	(-1.07)	(-1.45)	(-1.63)
N	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*

Table C3. Cumulative abnormal returns around general meetings with multi shareholder proposals

This table shows the mean cumulative abnormal returns around dates of general meetings with multi-shareholder proposals by voting outcome of proposals, related issue of shareholder proposals, and meeting type. Market model based on 200-day period ending 21 days prior to the general meeting date has been used to calculate CAR. FTSE All share index has been used for benchmarking. The cross-sectional t-test has been used to test the significance of mean differences. *, ** and *** indicate statistical significant of t-test at 10%, 5% and 1% level, respectively.

	CAR							
	Multi-proposal meetings							
	[-1,+1]	**[-1,0]**	**[0,+1]**	**[-2,+2]**	**[-1,+5]**	**[-1,+7]**	**[-5,+5]**	**[-10,+10]**
Defeated proposal	-1.914*	-1.142*	-1.185	-2.948**	-3.698**	-4.344***	-3.318**	-4.860**
	(-1.81)	(-1.71)	(-1.23)	(-2.09)	(-2.49)	(-2.87)	(-2.01)	(-2.62)
N	*56*	*56*	*56*	*56*	*56*	*56*	*56*	*56*
No-Defeated proposal	0.800	0.677	0.180	1.607	2.194	1.048	5.462**	7.082*
	(0.68)	(0.67)	(0.24)	(0.96)	(1.32)	(0.59)	(2.59)	(1.91)
N	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
EGM	-1.925	-0.429	-1.459	-3.490*	-4.841**	-5.045**	-4.525*	-3.605
	(-1.20)	(-0.47)	(-0.95)	(-1.94)	(-2.30)	(-2.40)	(-1.82)	(-1.20)
N	*32*	*32*	*32*	*32*	*32*	*32*	*32*	*32*
AGM	-0.400	-0.554	-0.264	-0.0960	0.253	-0.933	2.275	1.031
	(-0.46)	(-0.76)	(-0.44)	(-0.07)	(0.19)	(-0.66)	(1.49)	(0.44)
N	*54*	*54*	*54*	*54*	*54*	*54*	*54*	*54*
Defeated & AGM	-0.665	-0.884	-0.312	-1.519	-0.461	-1.506	0.596	-3.143
	(-0.57)	(-0.89)	(-0.37)	(-0.82)	(-0.25)	(-0.75)	(0.28)	(-1.31)
N	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
Defeated & EGM	-3.356*	-1.440	-2.192	-4.597**	-7.432***	-7.619***	-7.834***	-6.841**
	(-1.85)	(-1.60)	(-1.19)	(-2.15)	(-3.33)	(-3.52)	(-3.42)	(-2.38)
N	*26*	*26*	*26*	*26*	*26*	*26*	*26*	*26*
No-Defeated & AGM	-0.0689	-0.141	-0.205	1.682	1.145	-0.217	4.373*	6.248
	(-0.05)	(-0.13)	(-0.23)	(0.81)	(0.60)	(-0.11)	(2.04)	(1.49)
N	*24*	*24*	*24*	*24*	*24*	*24*	*24*	*24*
No-Defeated & EGM	4.275*	3.949	1.721	1.307	6.386*	6.108	9.816	10.42
	(2.23)	(1.73)	(1.46)	(0.96)	(2.27)	(1.62)	(1.55)	(1.22)
N	6	6	6	6	6	6	6	6

Defeated CG proposal (elect) & EGM	-3.078*	-1.677	-2.603*	-3.731*	-6.022	-4.271	-5.220	-1.900
	(-2.36)	(-1.94)	(-2.37)	(-2.42)	(-1.04)	(-1.17)	(-0.83)	(-0.48)
N	4	4	4	4	4	4	4	4
Defeated CG proposal (remove) & EGM	-2.271	-3.055	-2.054	-0.676	-5.966	-5.575	-9.211	-9.390
	(-0.84)	(-1.93)	(-0.63)	(-0.25)	(-1.03)	(-1.14)	(-1.88)	(-1.39)
N	5	5	5	5	5	5	5	5
Not-Defeated CG proposal (elect) & EGM	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-
Not-Defeated CG proposal (remove) & EGM	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-
Defeated CG proposal (elect) & AGM	-0.164	-2.819	0.0737	-0.690	-0.537	0.0264	-1.691	-5.525
	(-0.13)	(-1.71)	(0.05)	(-0.55)	(-0.37)	(0.02)	(-0.84)	(-1.82)
N	7	7	7	7	7	7	7	7
Defeated CG proposal (remove) & AGM	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-
Not-Defeated CG proposal (elect) & AGM	1.633	1.644***	0.933	2.812	0.415	-0.793	0.982	3.839
	(0.73)	(3.78)	(0.48)	(1.15)	(0.17)	(-0.23)	(0.28)	(0.60)
N	8	8	8	8	8	8	8	8
Not-Defeated CG proposal (remove) & AGM	-2.823	-2.493	-1.846	-0.153	-0.738	-3.587	4.968	6.192
	(-1.36)	(-2.08)	(-0.74)	(-0.02)	(-0.19)	(-0.99)	(1.10)	(0.79)
N	5	5	5	5	5	5	5	5

Table C4. Cumulative abnormal returns around general meetings: a comparison between first and subsequent meetings

This table shows the mean cumulative abnormal returns around dates of shareholder proposal general meetings by voting outcome of proposals, related issue of shareholder proposals, and meeting type with differentiating between first and subsequent meetings. Market model based on 200-day period ending 21 days prior to the general meeting date has been used to calculate CAR. FTSE All share index has been used for benchmarking. The cross-sectional t-test has been used to test the significance of mean differences. *, ** and *** indicate statistical significant of t-test at 10%, 5% and 1% level, respectively.

Panel A	***CAR***							
	First targeted meeting				***Not-First targeted meeting***			
	[-1,+1]	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**	**[-1,+1]**	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**
Defeated proposal	-2.627**	-2.989**	-4.057**	-4.807**	-0.530	0.502	0.265	-2.339
	(-2.40)	(-2.06)	(-2.32)	(-2.31)	(-0.70)	(0.41)	(0.21)	(-1.53)
N	*52*	*52*	*52*	*52*	*38*	*38*	*38*	*38*
Passed proposal	-1.432	-2.406	0.913	4.376	2.410	2.520	5.258	1.357
	(-0.96)	(-1.10)	(0.31)	(1.18)	(1.73)	(1.27)	(1.60)	(0.57)
N	*31*	*31*	*31*	*31*	*13*	*13*	*13*	*13*
CG proposal	-1.266	-1.224	-0.956	-0.235	-1.341	-1.067	1.348	-1.872
	(-1.35)	(-0.98)	(-0.57)	(-0.10)	(-1.26)	(-0.63)	(0.88)	(-0.87)
N	*71*	*71*	*71*	*71*	*32*	*32*	*32*	*32*
CSR proposal	-0.306	0.473	0.260	-0.0890	0.182	0.722	0.524	1.000
	(-0.25)	(0.41)	(0.15)	(-0.03)	(0.39)	(1.08)	(0.50)	(0.72)
N	*11*	*11*	*11*	*11*	*19*	*19*	*19*	*19*
CG proposal (elect)	-1.607	-1.527	-1.184	-0.732	-2.086	-3.457*	1.131	-3.018
	(-1.37)	(-0.94)	(-0.59)	(-0.26)	(-1.49)	(-1.86)	(0.93)	(-1.52)
N	*49*	*49*	*49*	*49*	*18*	*18*	*18*	*18*
CG proposal (remove)	-1.580	-2.142	-1.912	-1.245	-1.256	-1.838	5.273	0.147
	(-1.17)	(-1.16)	(-0.80)	(-0.38)	(-0.46)	(-0.41)	(1.43)	(0.03)
N	*44*	*44*	*44*	*44*	*12*	*12*	*12*	*12*
EGM	-2.661	-4.466*	-2.301	-2.275	0.149	2.910	-0.121	-4.527
	(-1.54)	(-1.90)	(-0.67)	(-0.65)	(0.10)	(1.13)	(-0.06)	(-1.07)
N	*29*	*29*	*29*	*29*	*10*	*10*	*10*	*10*
Panel B	***Defeated proposal***							
	First targeted meeting				***Not-First targeted meeting***			
	[-1,+1]	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**	**[-1,+1]**	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**
CG proposal	-3.268**	-3.963**	-5.334**	-5.702**	-0.793	0.551	0.848	-3.582

	(-2.55)	(-2.34)	(-2.65)	(-2.31)	(-0.65)	(0.27)	(0.42)	(-1.52)
N	*43*	*43*	*43*	*43*	*23*	*23*	*23*	*23*
CSR proposal	0.342	1.327	0.991	-0.668	-0.210	0.402	-0.449	0.288
	(0.27)	(1.15)	(0.59)	(-0.36)	(-0.49)	(0.65)	(-0.73)	(0.20)
N	*9*	*9*	*9*	*9*	*15*	*15*	*15*	*15*
CG proposal (elect)	-3.248*	-4.119*	-4.651*	-5.002	-2.317	-3.512	-0.0374	-4.511
	(-2.04)	(-1.84)	(-1.74)	(-1.58)	(-1.46)	(-1.49)	(-0.03)	(-1.76)
N	*30*	*30*	*30*	*30*	*12*	*12*	*12*	*12*
CG proposal (remove)	-4.430**	-6.605**	-8.625***	-8.198**	1.893	5.209	8.113	-6.098
	(-2.39)	(-2.73)	(-3.28)	(-2.36)	(0.36)	(0.56)	(0.93)	(-0.78)
N	*27*	*27*	*27*	*27*	*5*	*5*	*5*	*5*
EGM	-4.268**	-4.594*	-7.840***	-7.557**	-0.884	3.771	-1.847	-7.462
	(-2.14)	(-1.86)	(-2.83)	(-2.38)	(-0.46)	(1.02)	(-0.77)	(-1.39)
N	*23*	*23*	*23*	*23*	*7*	*7*	*7*	*7*

Panel C ***No-Defeated proposal***

	First targeted meeting				***Not-First targeted meeting***			
	[-1,+1]	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**	**[-1,+1]**	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**
CG proposal	1.808	2.982*	5.768**	8.162**	-2.742	-5.203	2.624	2.497
	(1.58)	(1.99)	(2.36)	(2.10)	(-1.28)	(-1.79)	(1.52)	(0.53)
N	*28*	*28*	*28*	*28*	*9*	*9*	*9*	*9*
CSR proposal	-3.222	-3.371	-3.030	2.517	1.651	1.919	4.174	3.669
	(-0.81)	(-1.31)	(-0.39)	(0.12)	(1.17)	(0.82)	(0.95)	(0.92)
N	*2*	*2*	*2*	*2*	*4*	*4*	*4*	*4*
CG proposal (elect)	0.985	2.566	4.290	6.010	-1.623	-3.346	3.467	-0.0311
	(0.64)	(1.29)	(1.59)	(1.19)	(-0.55)	(-1.01)	(1.35)	(-0.01)
N	*19*	*19*	*19*	*19*	*6*	*6*	*6*	*6*
CG proposal (remove)	2.948**	4.948**	8.750**	9.799*	-3.506	-6.872*	3.245	4.608
	(2.22)	(2.72)	(2.67)	(1.76)	(-1.29)	(-1.95)	(1.48)	(0.79)
N	*17*	*17*	*17*	*17*	*7*	*7*	*7*	*7*
EGM	3.500	-3.972	18.93*	17.97*	2.560	0.900	3.906	2.322
	(1.63)	(-0.58)	(2.13)	(2.32)	(1.02)	(0.74)	(1.22)	(0.42)
N	*6*	*6*	*6*	*6*	*3*	*3*	*3*	*3*

Panel D	***EGM***							
	First targeted meeting				***Not-First targeted meeting***			
	[-1,+1]	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**	**[-1,+1]**	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**
CG proposal	-2.604	-3.296	-4.129	-2.868	0.149	2.910	-0.121	-4.527
	(-1.45)	(-1.56)	(-1.36)	(-0.80)	(0.10)	(1.13)	(-0.06)	(-1.07)
N	*28*	*28*	*28*	*28*	*10*	*10*	*10*	*10*
CSR proposal	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-
CG proposal (elect)	-3.587	-4.441	-6.662**	-6.803*	0.758	-0.503	2.538	1.040
	(-1.63)	(-1.65)	(-2.25)	(-2.07)	(0.49)	(-0.35)	(1.67)	(0.40)
N	*21*	*21*	*21*	*21*	*7*	*7*	*7*	*7*
CG proposal (remove)	-2.362	-3.897	-4.350	-2.116	2.958*	5.371	0.694	-2.631
	(-1.18)	(-1.70)	(-1.39)	(-0.53)	(2.31)	(1.47)	(0.23)	(-0.59)
N	*25*	*25*	*25*	*25*	*6*	*6*	*6*	*6*
Panel E	***AGM***							
	First targeted meeting				***Not-First targeted meeting***			
	[-1,+1]	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**	**[-1,+1]**	**[-2,+2]**	**[-5,+5]**	**[-10,+10]**
CG proposal	-0.395	0.125	1.111	1.480	-2.019	-2.875	2.015	-0.666
	(-0.39)	(0.08)	(0.58)	(0.50)	(-1.47)	(-1.37)	(0.99)	(-0.26)
N	*43*	*43*	*43*	*43*	*22*	*22*	*22*	*22*
CSR proposal	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-
CG proposal (elect)	-0.122	0.659	2.925	3.821	-3.895*	-5.336*	0.235	-5.600*
	(-0.10)	(0.34)	(1.16)	(0.93)	(-2.04)	(-1.89)	(0.14)	(-2.15)
N	*28*	*28*	*28*	*28*	*11*	*11*	*11*	*11*
CG proposal (remove)	-0.551	0.169	1.296	-0.0989	-5.470	-9.048	9.853	2.926
	(-0.32)	(0.06)	(0.35)	(-0.02)	(-1.13)	(-1.23)	(1.52)	(0.33)
N	*19*	*19*	*19*	*19*	*6*	*6*	*6*	*6*