Essays on family business groups, corporate investments, and cash management

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Ang, Alvin

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ESSAYS ON FAMILY BUSINESS GROUPS, CORPORATE INVESTMENTS, AND CASH MANAGEMENT

Alvin Ang

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This thesis consists of three independent essays in empirical corporate finance. The first essay examines how the business group structures facilitate higher investment rates of group-affiliated firms relative to standalone firms in the face of supply shocks to external financing precipitated by the 2008 Global Financial Crisis. This study finds that access to an internal capital market via membership of a business group moderates the firms' dependence on external capital. Consequently, group-affiliated firms have financing and investment advantages over standalone firms especially during a financial crisis. The evidence sheds light on the heterogeneity of firm-level investment policy responses when external capital markets are under severe stress.

The second essay examines whether a firm's qualitative funding disclosures provide credible information to the market about the firm's financing policy. Using an innovative textual analysis technique known as grammatical Natural Language Processing to identify types of funding sources in the "Liquidity and Capital Resources" section of 10-K filings, the study documents evidence that firms that disclose plans to rely on external financing do indeed issue more equity and debt securities, and have higher investment rates in the next period. Moreover, since the disclosures transfer information to the market, they reduce information asymmetry, and consequently lead to a lower cost of capital for firms disclosing more information. This study sets a new benchmark for textual analysis methodology, and stresses the importance of qualitative disclosures in providing useful predictive information to outsiders.

The third essay examines how political uncertainty affects corporate cash holdings. The study's use of hand-collected data on political incidents of a non-electoral nature instead of national elections to proxy for political uncertainty mitigates endogeneity concerns. Consistent with the precautionary motive for holding cash, the results show that firms increase cash balances by 5.2% in years when non-electoral incidents occur, while there is no statistically significant change to cash holdings around national elections. The two key implications of this study are 1) political uncertainty significantly impacts cash management decisions, and 2) national elections are not a good identification of political uncertainty.

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ABSTRACT

Alvin Ang: Essays on Family Business Groups, Corporate Investments, and Cash Management
(Under the direction of Jason Zein and Ronald W. Masulis)

This thesis consists of three independent essays in empirical corporate finance. The first essay examines how the business group structures facilitate higher investment rates of group-affiliated firms relative to standalone firms in the face of supply shocks to external financing precipitated by the 2008 Global Financial Crisis. This study finds that access to an internal capital market via membership of a business group moderates the firms' dependence on external capital. Consequently, group-affiliated firms have financing and investment advantages over standalone firms especially during a financial crisis. The evidence sheds light on the heterogeneity of firm-level investment policy responses when external capital markets are under severe stress.

The second essay examines whether a firm's qualitative funding disclosures provide credible information to the market about the firm's financing policy. Using an innovative textual analysis technique known as grammatical Natural Language Processing to identify types of funding sources in the "Liquidity and Capital Resources" section of 10-K filings, the study documents evidence that firms that disclose plans to rely on external financing do indeed issue more equity and debt securities, and have higher investment rates in the next period. Moreover, since the disclosures transfer information to the market, they reduce information asymmetry, and consequently

lead to a lower cost of capital for firms disclosing more information. This study sets a new benchmark for textual analysis methodology, and stresses the importance of qualitative disclosures in providing useful predictive information to outsiders.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1 Background and Contributions

The overarching theme of this thesis is to utilize unique datasets and innovative methodologies to examine corporate finance topics encompassing corporate investments, financing policy, cost of capital, and cash management. Each essay in this thesis extends existing findings in the literature and also presents new evidence on the research topic in question either with using comprehensive international data or through refining conventional techniques.

In the first essay, we investigate how family business group members' investment decisions are affected by an exogenous shock, namely the 2008 Global Financial Crisis (GFC). Using a comprehensive dataset of 17,688 non-financial firms from 45 countries and carefully identifying 2,863 firms as part of family business groups, we examine whether the internal capital markets in family business groups around the world alleviate the GFC-induced external financing constraints. We find that during the GFC the family group-affiliated firms on average cut investments by less than similar standalone firms. We also find that investments of group firms during the GFC become less sensitive to their own cash flows and more sensitive to the cash flows of other group members, especially those with greater financial slack, compared to the pre-GFC period. For a subsample of diversified groups, we propose an identification strategy, which shows that the post-GFC change in a group firm's investment is determined by exogenous variations in its affiliated firms' cash flows. Finally, we find that groups utilize equity primarily in the form of seasoned equity offerings (SEOs) to channel capital to affiliated firms during the GFC. The evidence highlights the important capital allocation role performed by the internal capital markets of business groups when external markets function poorly.

The findings in the first essay extends our understanding of the functions of internal capital markets in that firms connected via common ownership linkages in a business group structure have a strategic financing advantage. Specifically, the internal capital market provides an alternative source of capital in addition to funding from the external capital market, thereby mitigating external financing constraints. The study also contributes to a growing literature in business groups by uncovering evidence on the positive aspects of group affiliation, namely benefits from coinsurance and risk-sharing within groups. Finally, the research offers a robust explanation of how some firms are able to continue with their corporate investment plans despite a financial crisis and defy the global trend of investment cuts during the GFC.

In the second essay, we study whether qualitative funding disclosures provide credible information about the firm's future financing and investment policies, and the implications on the firm's cost of capital. We develop a program based on a grammatical Natural Language Processing (NLP) technique, which explicitly considers the contextual relationship among words such that it allows for accurate identification and classification of funding disclosures without subjective interpretations. We document that qualitative funding disclosures in 10-K filings prescribed by SEC Regulation S-K contain credible information about the firm's planned sources of internal and external funds. Firms that disclose their intentions to rely on external financing ex ante do indeed raise more debt and equity capital subsequently. We also find that firms with more external funding sources tend to engage in higher investment activity. Furthermore, we show that funding disclosures transfer information from corporate managers to outsiders, which mitigates information asymmetry. And, firms with more disclosures benefit from a lower cost of capital. The crucial implication of this

study is the information structure of firms is relevant beyond accounting numbers, and proper management of disclosure policies can produce tangible benefits.

The NLP methodological innovation developed in the second essay improves upon conventional textual analysis techniques, which heavily rely on keyword searches. Because NLP uses grammatical context to extract the information content in sentences, it greatly reduces the chances of committing systematic errors in identification and interpretation of qualitative information that are common in naive keyword-style textual analysis methods. This sets a higher benchmark for research utilizing textual analysis. Second, the findings in the this essay contributes to the information disclosure literature in both finance and accounting by showing that funding disclosures can predict future firm activities, and are value-relevant to firms in terms of reducing the cost of capital.

In the third essay, we examine the effects of political uncertainty on corporate cash holdings to further our understanding of how politics significantly influences corporate decisions and outcomes. However, instead of using national elections as a proxy for political uncertainty, we hand-collect non-electoral incidents causing political uncertainty from 6 East Asian countries to act as exogenous political shocks to firm economics. The use of non-electoral incidents instead of elections provides better identification of political uncertainty and sets a strong natural experimental framework for causal interpretations. On average, firms increase cash levels by 5.2% in the year incidents occur. And, up to two years after a non-electoral political incident occurs, firms continue to increase cash holdings in response to the incident, which shows the persistence of political uncertainty on cash policy. Variations in cash policy responses are driven by structural differences in political governance,

shareholder protection levels, and industry sensitivity to politics. These findings provide support for the precautionary motive of holding cash during periods of political uncertainty.

The findings in the third essay extend the literature in political economics in two key ways. First, to the best of our knowledge, there is not a dedicated study thus far examining the connection between political uncertainty and corporate cash management. Many studies investigating the effects of political uncertainty on corporate finance decisions focus on investment policy, and assume that cash policy is simply a mechanical outcome of investment decisions. The evidence presented in this essay contradicts that view by showing that when there is political uncertainty, the magnitude of an increase in cash holdings is greater than that of a decrease in investment rate. Second, this essay addresses a key endogeneity concern with using national elections to proxy for political uncertainty. Unlike elections, non-electoral incidents causing political uncertainty occur randomly with outcomes that are difficult to predict. Therefore, non-electoral incidents represent stronger exogenous shocks to the firm compared to national elections whose timing are known in advance. This permits a more accurate examination of the causal effects of political uncertainty on corporate decisions and outcomes.

1.2 Presentations

The research in this thesis has been presented and defended at various conferences specified below:

Chapter 2: Internal Capital Markets of Family Business Groups During the Global Financial Crisis

2013 Family Business Workshop, National University of Singapore, Singapore

2014 Finance Seminar, University of Adelaide, Adelaide, Australia

2015 Asian Finance Association Conference, Changsha, China

2015 FMA Annual Meetings, Orlando, FL, United States

2015 FMA Asian Conference, Seoul, Korea

2015 FMA European Conference, Venice, Italy

2015 Northern Finance Association Conference, Lake Louise, Canada

2015 Southwestern Finance Association Conference, Houston, TX, United States

2015 Summer Institute of Finance Conference, Beijing, China

Chapter 3: Funding Disclosures, Information Asymmetry, and the Cost of Capital

2016 Asian Finance Association Conference, Bangkok, Thailand

Chapter 4: Non-Electoral Political Uncertainty and the Precautionary Motive for Holding Cash: Evidence from East Asia

2016 UNSW Business School Brown Bag Seminar, Sydney, Australia

CHAPTER 2

INTERNAL CAPITAL MARKETS IN FAMILY BUSINESS GROUPS DURING THE GLOBAL FINANCIAL CRISIS

2.1 Introduction

An internal capital market is canonically described in the literature as a channel through which capital is allocated across different divisions within a firm. Unlike external capital markets which tend to use a price-setting mechanism, internal capital markets typically rely on a centralized decision-making authority such as the CEO or controlling shareholder to allocate capital. In a corporate investment environment with high information asymmetry, such internal control can efficiently allocate resources to segments that would otherwise find it difficult to obtain capital independently from the external markets. Recognizing the important role internal capital markets perform in allocating capital within firms, prior studies have focused on examining the effectiveness of these markets in multi-segment firms, and uncover evidence of cross-subsidization among business segments (see Billett & Mauer, 2003; Lamont, 1997; Shin & Stulz, 1998). Recent studies such as Duchin and Sosyura (2013) and Glaser, Lopez-De-Silanes, and Sautner (2013) examine how interactions between a CEO and divisional managers affect capital allocation activity within conglomerates.

The central issue in studying the functioning of internal capital markets using multi-segment firms is that many critical aspects of individual decisions within a firm are usually unobservable. Instead of using segment-level data of publicly listed conglomerates, we examine the internal capital markets created by independently-listed firms connected through common ownership linkages. Such collectives of firms are referred to as business groups. A clear advantage of studying business groups, where each member firm is listed, is that we can clearly observe each group member's market valuation as well as financial data on capital flows and expenditures. Hoshi,

Kashyap, and Scharfstein (1991) and Almeida, Kim, and Kim (2015) have utilized this approach to examine corporate investment patterns of Japanese and Korean business groups. However, no studies have examined the roles of internal capital markets in allocating business group investments on a global scale, using cross-country data.

The functioning of internal capital markets is clearly seen at times when the supply of external capital is seriously disrupted. Our study explores the effects of the recent Global Financial Crisis (GFC) during which access to external capital supply was severely constrained and in many cases posed a systemic threat to the survival of firms. Kahle and Stulz (2013) document evidence on the overall curtailment in capital expenditures in non-financial U.S. firms during the crisis, but they do not find conclusive evidence that this change in investment activity is caused by a shock to external credit supply since highly levered firms, which should find it most difficult to increase borrowing, actually cut investment spending less than the average firm. This finding suggests that some firms may be utilizing other sources of funding to support their investment policies despite facing external capital constraints. One possible example of such firms are those associated with business groups, that can obtain financing from other member firms in the same group through a group's internal capital market. In other words, if internal capital markets exist within business groups and are actively functioning, then they should be of critical importance in times of severe negative external capital supply shocks.

The GFC is an ideal setting to study the heterogeneity in investment policies between group-affiliated and standalone firms in response to an exogenous shock to external capital supply for various reasons. First, The sudden nature of the crisis, as reflected by sharp and significant stock market declines in 2008, implies that

ex ante changes to group structures in anticipation of the event are very unlikely. Second, unlike other crises such as the 1997 Asian financial crisis, where business groups are often cited as possibly an underlying cause or a factor that exacerbate its severity, the GFC has its geographic origin in the United States, where groups are not a dominant organizational form. Third, the genesis of the GFC is unrelated to corporate investment activity. Rather, the trigger is overexposure of banks to subprime mortgages and their derivative instruments. For these reasons, the GFC can be viewed as an externally transmitted shock to the availability of external capital that is also exogenous to group structures.

Using a panel of 17,688 non-financial firms from 45 countries, we identify 2,863 firms as affiliated to family business groups. We focus on groups controlled by individuals or members of a family (henceforth, family business groups) because controlling families tend to exert a tight grip on their member firms (Burkart, Panunzi, & Shleifer, 2003) and thus function as a central decision maker in carrying out internal capital reallocations, similar to that of ICMs in conglomerates. Our study finds that during the GFC, group affiliation moderated the reduction in corporate investments by an average of 25% relative to the decline in investment experienced by standalone firms. The moderation to investment declines is manifestly stronger for group-affiliated firms in emerging economies, and most pronounced in family business groups with a banking affiliate. This evidence forms the basis of our investigation on internal capital market activities during the GFC as demonstrated by the relationship of a particular group firm's investments with its own cash flows and those of other firms in the same group. We find that during the GFC, the correlation of a group firm's investment with its own cash flows declines by more

than 30%, indicating that groups firms are relying on resources beyond their own to finance new and sustain current investments. In contrast, standalone firms show a two-fold increase in correlation between their investments and own cash flows during the GFC, indicating an increase dependence on internal funds to finance investments. We further investigate the directional flow of resources within groups to examine whether the internal capital market does indeed resolve the underinvestment problem by channeling resources from firms with excess capital to those with valuable investment opportunities but lack capital. Our results show that there is evidence of capital flows from firms with the most financial slack to those with the least slack, but not capital flows in the opposite direction. These results are robust to excluding distressed firms within business groups from the analysis, which shows that the internal capital markets within groups do not function just to prop up failing member firms during the GFC.

Next, we examine the channels through which the group internal capital markets reallocate capital to support the investment activity of group member firms. We conjecture that group firms rely less on their own cash flows to finance investments because they are better able to raise equity capital than standalone firms as a result of other member firms purchasing stakes through a public equity offering. We investigate our conjecture by collecting data on the identity of block purchasers of seasoned equity offerings (SEOs) conducted by group firms over our sample period. We find that during the GFC, overall SEO activity by group firms increase by 6.2% while that of standalone firms decrease by 5.6%. Moreover, group firm SEOs that are block purchased by other affiliates increase by 3.3% during the GFC, thus showing that intra-group equity investments is the key mechanism for capital reallocation

within business groups.

It is possible that our results showing a strong sensitivity between group firm investments and other affiliates' cash flows could be driven by unobservable inter-temporal changes in growth opportunities and other financial characteristics common to all firms in a given group. It can also be argued that within-group transactions may cause investments and cash flows of group member firms to be correlated. To address these concerns, we employ an instrumental variable test by exploiting differences in industry-wide responses to the GFC for a subsample of multi-industry groups. We construct a variable to measure the crisis-induced cash flow shock at the industry level for a subject firm operating in that industry as an instrument for the cash flows of the subject firm. Thus, our instrumental variable is orthogonal to the cash flows of group member firms operating in other industries, but correlated to the investments of the subject firm. Our identification strategy allows us to test the causal effect of group affiliates' cash flows on a particular member firm's investment activity. The results from this analysis show that if a group has member firms in industries less affected by the GFC, other member firms in the same group, but in industries strongly affected by the GFC, benefit by only requiring smaller reductions in their own investments. This affirms our central hypothesis that group affiliation is the cause of higher investment activity by group firms relative to standalone firms during periods of external capital supply shortages.

This study provides several important contributions to various strands of the corporate finance literature. First, extant studies of internal capital markets within conglomerates do not show how the functioning of these markets is affected by external market conditions. We produce evidence to show that the investments of firms benefit

from the support of internal capital markets and exhibit less sensitivity to changes in external capital market conditions, which demonstrates that the importance of internal capital markets go beyond mere redeployment of assets and extends to a strategic financing advantage by providing an important alternative source of capital. Second, this study expands on the nascent research on business groups by providing new evidence on resource sharing within groups, and how ownership linkages affect individual firm's financing and investment policies. Furthermore, we show that it is also important to consider the potential benefits of group affiliation such as receiving capital support for investments, which is an important group firm advantage over standalone firms. This contributes to our general understanding of why business groups are prevalent in many countries around the world, despite a large body of evidence that controlling shareholders utilize a business group organizational form to tunnel resources and expropriate minority shareholders. Finally, we contribute to a growing volume of financial crisis studies by offering a better understanding of how firms respond to challenges in external funding and its impacts on firms' investment policies.

The remainder of the chapter proceeds as follows. In Section 2.2, we review the literature in internal capital markets of conglomerates, business groups, and the GFC before developing testable hypotheses. Section 2.3 describes our data and empirical methods. Section 2.4 presents our results, and Section 2.5 concludes. Variable descriptions are detailed in the Appendix in Section 2.6.

2.2 Hypothesis Development

2.2.1 Internal Capital Markets of Conglomerates

In the strictest definition, an internal capital market is formed when there exists capital allocation activity within a firm with multiple segments or diversified business units, each competing for capital from corporate headquarters to finance their own investment projects. Such multi-segment firms are commonly known as conglomerates. Single-segment or standalone firms, on the other hand, obtain financing only from the external capital markets.

Stein (1997) describes corporate headquarters in conglomerates as an agent endowed with control rights such that they may redistribute capital across segments according to ex-ante investment prospects. Stein's theoretical model predicts that since headquarters capture some of the private benefits of projects, they thus have the incentive to allocate more capital to segments considered "winners". This view is supported by Gertner, Scharfstein, and Stein (1994) who show that corporate headquarters possess superior information on investment prospects that the external capital markets do not, thereby reducing the amount of asymmetric information. They argue that the presence of internal capital markets allow for the efficient redeployment of resources, albeit at the cost of reducing entrepreneurial incentives of segment project managers.

While these two theoretical work suggest that segments within conglomerates may benefit from the more efficient allocation of capital internally, Scharfstein and Stein (2000) present an alternate theoretical model yielding the exact opposite conclusion. In their model, segment managers can engage in rent-seeking behavior by

bargaining for higher compensation from the CEO, who has sole authority over capital allocation. They show that the CEO prefers to compensate rent-seeking managers with more capital allocation instead of cash payments. And since managers of weaker segments (i.e. segments with poorer investment prospects) are more inclined to engage in rent-seeking activity, internal capital markets function inefficiently, and distort investments.

Notwithstanding the ambivalent theoretical predictions on the efficiency of internal capital markets, a key consequence of the presence of internal capital markets is segments within conglomerates become interdependent in terms of their investments because given limited corporate resources, allocation of internal capital across segments is a zero-sum game. With a sample of large U.S. conglomerates with oil and non-oil segments , Lamont (1997) show that the adverse cash flow shock during the 1986 oil crisis led to investment cuts even in the non-oil segments. Thus, Lamont's evidence supports the interdependent segments within conglomerates viewpoint.

Billett and Mauer (2003) also show that significant cross-subsidization between segments occur in diversified U.S. conglomerates. Financially-constrained segments regardless of investment opportunities[1] that receive subsidies from other segments increase firm value. When subsidies flow from segments with better investment opportunities to financially-constrained segments with poorer investment opportunities (inefficient transfers), firm value decreases. Their findings show evidence that internal capital markets can function both efficiently and inefficiently. Nevertheless, financially-constrained segments with good investment opportunities benefit from

[1]Billett and Mauer (2003) describe subsidies to financially-constrained segments with good investment opportunities as an efficient transfer of capital consistent with the argument that internal capital markets are efficient. Conversely, inefficient transfers are subsidies to segments with poor investment opportunities.

internal capital markets because they would be unable to finance those projects if they were standalone firms.

In a comparison between the investment-cash flow sensitivities of single-segment standalone firms and multi-segment diversified conglomerates, Shin and Stulz (1998) find that investments of segments are less sensitive to their own cash flows than comparable standalone firms. This finding provides evidence of functioning internal capital markets within conglomerates. Similar to Lamont (1997), they also find that when there are adverse cash flow shocks to a segment, other segments in the conglomerate cut back on investment regardless of investment opportunities. This finding suggests that internal capital markets function in a quasi-socialistic and possibly inefficient manner, supporting the prediction of Scharfstein and Stein (2000).

A common criticism to the preceding empirical studies is the measurement error in segment-level accounting data. Due to possible transfer pricing and asset allocation between related segments, profits may have been inflated or deflated for certain segments. To address this concern, Ozbas and Scharfstein (2010) examine only unrelated segments of conglomerates because such segments are very unlikely to reallocate profits, and compare them to similar standalone firms. They find that investments of standalone firms are more sensitive to industry Q, which is a measure for industry investment opportunities, than those of comparable unrelated segments within conglomerates. Moreover, they also show that the efficiency of internal capital markets is associated with the severity of agency problems as proxied by managerial ownership; the investments of unrelated segments are more sensitive to investment opportunities thus, more efficient, at firms with high managerial ownership.

2.2.2 Overview of Business Groups

Closely-related to the conglomerate literature is that of business groups, which has received relatively less attention. In their seminal work, La Porta, Lopez-De-Silanes, and Shleifer (1999) identify firms with common ownership linkages in 27 wealthy economies. They define a business group as a collection of independent firms with a single shareholder controlling at least 20% of the voting rights in each firm either directly or indirectly through other firms. They find that business groups are particularly prevalent in economies with weak shareholder protection, and less-developed market institutions. Moreover, the overwhelming majority of ultimate shareholders of business groups are families.

A more comprehensive study of family business groups covering 45 countries by Masulis, Pham, and Zein (2011) further show that the availability of external financing is negatively-associated with the presence of business groups. This suggests that in addition to enhancing the ultimate shareholders' control rights over groups of firms particularly in pyramidal structures, as shown by Almeida and Wolfenzon (2006b), business groups also exist possibly to alleviate external financing constraints. This notion is shared by Khanna and Yafeh (2007) who postulate that in underdeveloped economies plagued with severe information problems, raising capital from within diversified business groups might be more expedient and less costly than raising capital externally. Therefore, one can describe the capital markets within business groups in the likes of internal capital markets of multi-segment conglomerates.

Extant empirical evidence on the functioning of internal capital markets within business groups are predominantly country-specific, while substantive theoretical work in this area is scarce. Hoshi et al. (1991) examine a sample of Japanese business

groups known as *keiretsu*[2] and find that when compared to firms unaffiliated to any *keiretsu*, the investments of group-affiliated firms are less sensitive to their own liquidities. They interpret this finding as *keiretsu* firms probably have a competitive advantage over unaffiliated firms in terms of access to lower cost of capital from the sponsoring *keiretsu* bank. In another country-specific study, Almeida et al. (2015) compare changes in investments of Korean business group or *chaebol*[3] firms to unaffiliated firms during the 1997 Asian Financial Crisis, and find that group-affiliated firms increased investments more than unaffiliated firms in the aftermath of the crisis. They attribute this finding as the positive effect of the internal capital markets of *chaebol* mitigating adverse external capital shocks during the crisis, thus enabling *chaebol* firms to become more profitable after the crisis.

Yet, not all empirical evidence laud the positive side of business groups as an organizational form. One of the strongest criticisms is the controlling shareholder can siphon profits away from some group-affiliated firms in which he has low cash flow rights to those in which he has high cash flow rights. This is known as "tunneling" as described by Bertrand, Mehta, and Mullainathan (2002) in their study of Indian business groups. They quantify tunneling in business groups by measuring the diversion between a group-affiliated firm's reported performance and predicted performance based on industry shocks. A large diversion is indicative of tunneling, but stronger evidence is shown when the performance of firms in which the controlling

[2] *Keiretsu* is the Japanese term describing a collection of firms with strong interdependent business relationships. Firms in the same *keiretsu* are connected to a single bank which provides much of the financing for the investment projects of member firms. The protracted economic recession in Japan during the 1990s led to widespread disintegration of *keiretsu*.

[3] *Chaebol* is the Korean term for business groups. However, unlike Japanese *keiretsu*, *chaebol* do not necessarily include banks owning equity stakes in the affiliated firms. Instead, through a web of cross-shareholdings, *chaebol* firms are owned by powerful and usually politically-connected families. Today, large *chaebol* such as Samsung, Hyundai, and LG continue to play significant roles in the Korean economy.

shareholder has high cash flow rights is significantly sensitive to shocks affecting the performance of firms in which he has low cash flow rights. Indeed, Bertrand et al.. find the presence of tunneling and expropriation of minority shareholders in Indian business groups. In a similar vein, Bae, Kang, and Kim (2002) show that minority shareholders of *chaebol*-affiliated firms making acquisitions experience negative abnormal bidder returns while the controlling shareholders gain, which implies that value is diverted away from bidding firms, consistent with the tunneling view. Baek, Kang, and Lee (2006) present more direct evidence of tunneling in *chaebol* when they find that controlling shareholders utilize intra-group private security offerings as a mechanism to enrich themselves through the setting of offering prices.

Given these conflicting evidence on the externality effects of business groups, the perennial question whether they are beneficial to economies remain unanswered. Almeida and Wolfenzon (2006a) present a model under an equilibrium framework to show that when business groups and conglomerates allocate capital to projects via their respective internal capital markets, these allocations regardless of efficiency actually constrain the external capital markets and thus adversely affect economy-wide capital allocation. In other words, even if internal capital markets of business groups are efficient, standalone firms with good projects will face more difficulty in raising capital, potentially leading to underinvestment. Almeida and Wolfenzon conclude strongly that business groups pose negative effects particularly for developing economies and should be discouraged by policies. On the other hand, Khanna and Palepu (2000) find that group-affiliated Indian firms show better performance than standalone firms when the groups are the most highly-diversified because those groups

essentially perform the functions of market institutions that are usually lacking and weak in emerging economies. Thus, unlike group-affiliated firms, standalone ones have to contend with increased costs from information and regulation problems when dealing with external institutions. Although Khanna and Palepu (2000) suggest that large diversified business groups could add value to emerging economies when groups act as intermediaries for weak institutions, they caution that Indian business groups differ substantially in structure from business groups elsewhere in the world.

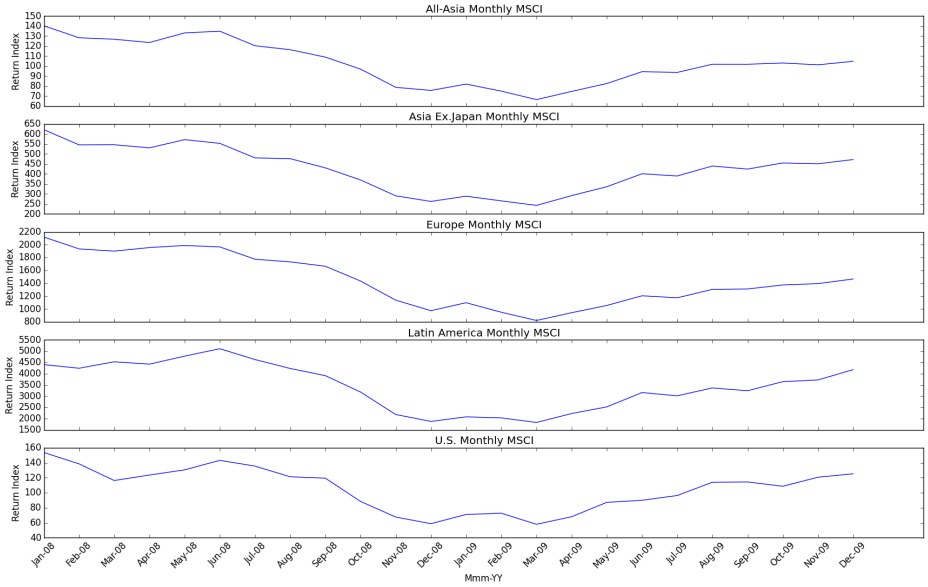
2.2.3 The GFC

Since the Great Depression during the late 1920s, economies around the world have not experienced as dire a financial crisis as the one occurring in 2008. Gorton (2008) presents a comprehensive account of how escalating defaults in subprime mortgages in the U.S. after a period of loose monetary and credit policies under Federal Reserve chairman, Alan Greenspan, precipitated into a worldwide financial crisis. Although the grave impact of the crisis was felt in the equity markets after the fall of Lehman Brothers and the near-bankruptcy of AIG in the last quarter of 2008, both academics and practitioners concur that the crisis was incipient as early as the beginning of 2008. Overall, equity markets in both emerging and developed countries yielded extreme negative returns. But, the U.S. and European markets were most severely hit compared to the Asian (excluding Japan) and South American markets. Figure 2.1 show the monthly MSCI return index from January 2008 to December 2009 for 5 regions; Asia, Asia excluding Japan, Europe, Latin America, and the U.S. The MSCI index was at the lowest point in March 2009 during the 24-month period for all 5 regions with the U.S. seeing the largest drop of 62% since January 2008 followed by

Europe at 61%, and Asia excluding Japan at 60%.

Figure 2.1: Monthly MSCI Return Index by Region

The figure shows the monthly MSCI return index during the 2008–2009 GFC for five regions; Asia, Asia excluding Japan, Europe, Latin America, and the U.S.



The immediate consequence at the onset of the crisis was a massive contraction of credit availability. Ivashina and Scharfstein (2010) show that banks severely curtailed lending activity during the crisis. In particular, banks with lower deposit bases and more outstanding credit-lines cut the supply of new loans most. Another reason why banks cut lending is they had to shore up loan loss reserves given the spike in defaults not just in mortgages, but also across a range of loans. This drove the Federal Reserve under chairman Ben Bernanke to institute unprecedented bailout and financial aid programs, such as the US$182 billion bailout of AIG and the Troubled Asset Relief Program (TARP), to rescue corporations that pose a systemic risk to the economy and to boost capital supply in an effort to curb the economic recession.

Campello, Graham, and Harvey (2010) survey chief financial officers in 39 countries across Asia, Europe, and the U.S., and find that because of the deficit in external

capital, financially-constrained firms were forced to cut investment spending, sell assets, and rely on their own cash reserves to weather through the crisis. However, Campello, Giambona, Graham, and Harvey (2011) show that firms were able to boost investments during the crisis if they had greater access to credit lines. These studies confirm that during the crisis, external capital was scarce and firms around the world reacted by reducing capital expenditures among other spending cuts. However, firms that had continued access to other sources of capital were actually able to boost investments, or at least not have to cut investments by as much.

At the time of writing this paper, there is a dearth of studies examining the impact of financial crises on business groups. One such study is Lins, Volpin, and Wagner (2013) who find that family business groups tend to cut investments in healthier firms and channel resources to rescue distress member firms during the GFC. A similar study by Claessens, Djankov, and Klapper (2003) show that group-affiliated East Asian firms are less likely to file for bankruptcy during the 1997 Asian Financial Crisis compared to standalone firms. This result is even more significant for firms in groups that own banks. These two studies suggest the presence of coinsurance effects within business groups, and also demonstrate the competing views in the literature; coinsurance could be at the detriment of minority shareholders, but group-affiliation may alleviate financial constraints of member firms.

2.2.4 Testable Implications

Business groups resemble multi-segment conglomerates because one can parallel the firms connected via ownership linkages to form a business group as the segments in a conglomerate. However, unlike conglomerates in which the existence of centralized

capital allocation is assumed since segments do not typically access the external markets independently, and have to rely on headquarters to supply investment capital, that assumption cannot be indiscriminately applied to business groups. Because each firm in a group is independently-listed, by definition group-affiliated firms have the ability to access the external capital markets on their own and not have to rely on within-group capital allocation.

Although extant literatures on business groups suggest that internal capital markets exist in groups as second-best substitutions for weak market institutions[4], stronger evidence is needed to prove that they are actually functioning. Unfortunately, one cannot directly observe the complete flow of capital between group-affiliated firms because it can take on many different forms from direct equity stakes and bond purchases, to private loans. Borrowing from the conglomerate literature, one can infer that internal capital markets exist in business groups if the investments of group-affiliated firms are less sensitive to their own cash flows relative to a control group of standalone firms. Moreover, if the investments of group-affiliated firms are sensitive to the cash flows of *other* firms belonging to the same group, then it further substantiates the hypothesis of internal resource transfers within groups.

The second line of inquiry examines the inter-temporal investment patterns of group and non-group firms before and during the GFC. The crisis was an exogenous shock to external capital supply and present an ideal setting for investigating the impact of external financial constraints on corporate investments. Duchin, Ozbas, and Sensoy (2010) show that investments of non-financial firms declined significantly at the onset of the crisis, but firms with more cash reserves and less short-term debt

[4]Bertrand and Schoar (2006) examine possible explanations for the prevalence of family-controlled firms, and suggest that strong family ties and values are solutions to weak labor markets and legal frameworks, which form the economic imperative for their existence.

were able to mitigate the adverse effects. If internal capital markets exist within business groups, then their functioning should be most critical during a period of severe external capital constraints. Plausibly, group-affiliated firms should be able to rely on the cash flows from other member firms to boost investments during the crisis despite a deficit in external capital. Standalone firms on the other hand have no such advantage. If this conjecture holds, then one would expect the investments of group-affiliated firms to be less sensitive to their own cash flows and more sensitive to the cash flows of other member firms during the crisis compared to standalone firms.

A further auxiliary test is to infer the direction of capital flows within groups. Rationally, capital should flow from firms that are less financially-constrained to those that are more constrained. Although this does not axiomatically prove that internal capital markets of business groups are efficient, it does imply that capital allocations in groups play a supportive role and could be construed as a positive effect since financial constraints of member firms are alleviated.

2.3 Sample and Methodology

2.3.1 Data

We begin with a sample of listed firms in 45 markets with clearly identified ownership structures obtained from Masulis et al. (2011), henceforth referred to as the "MPZ" dataset[5]. Through a rigorous ownership identification process, they construct the

[5]Masulis et al. (2011) obtain ownership data from the Osiris and Worldscope databases provided by Bureau Van Dijk and Thomson Reuters, respectively. For firms with missing shareholder data, they manually peruse through other information sources such as LexisNexis, Factiva, and Dun and Bradstreet's Who Owns Whom to uncover the ultimate controlling shareholders.

group-affiliations of 28,635 firms, and find 951 family business groups and 418 non-family groups comprising 3,007 and 1,575 firms, respectively. The MPZ dataset is the most comprehensive sample of international business groups to date. However, the ownership linkages in the sample is as of 2002, which requires updating to better-suit the tests in this study.

For tractability considerations, we do not update the group structures using the identification process in Masulis et al.[6] Moreover, manual construction of group structures on an annual basis will very likely yield marginal additional information since corporate control tends to be quite static with minimal year-to-year variations. The more expedient method to update group structures is to track IPO and merger and acquisition (M&A) activity since business groups change when new firms are listed, acquired, de-listed or merged with other firms. Thus, we collect all reported IPOs and M&As from Thomson Reuters SDC, and Bureau Van Dijk Zephyr databases from January 2003 to December 2007. Since this study requires comparing the functioning of internal capital markets in business groups before and during the GFC, it is therefore appropriate to update the ownership linkages at the point of entering the GFC.

For each IPO, the parent listing firm is clearly reported, which allows for matching by name and SEDOL to firms in the MPZ dataset. If the parent firm is part of an existing business group, then the new IPO firm is added to the group. If however, the parent firm is a standalone firm in the MPZ dataset, then the IPO firm and the parent firm create a new business group. Since the ultimate shareholders of the

[6]They first identify whether a firm has any shareholder controlling at least 20 percent of the voting rights or 10 percent if that shareholder is the founder, CEO, or chairman of the board, otherwise the firm is considered widely-held. They continue this process iteratively until the ultimate controlling shareholder who fall in one of the three categories, families, governments, or corporations is identified. Firms with the same ultimate shareholder are classified in a business group.

parent firms are already identified, new business groups can be readily classified as family or non-family groups. For acquisitions, we trace the acquiring and target firms to the MPZ dataset. Standalone acquirers that purchase controlling voting rights (as per the definition in Masulis et al., 2011) in the target firms create new business groups while group-affiliated acquirers expand their groups through the purchase of targets.

If the target firm is already group-affiliated in the MPZ dataset, then we remove the firm from this group to account for the "loss" of a member firm to the acquirer. Note that acquisitions with less than the defined controlling rights are not considered in this group updating process. For mergers, at least two independently-listed firms become one. If the newly-created firm has a controlling shareholder that is group-affiliated, then that firm becomes part of the group. Otherwise, the merged firm is classified as standalone. In theory, groups can also disappear when firms in the same business group merge to form a single entity, but this scenario did not occur in our sample. We repeat this process annually from the beginning of 2003 to the end of 2007 until we obtain a new dataset of affiliated and standalone firms as of 2007. We also ensure that de-listed firms are removed from the sample. We do not identify non publicly-listed firms that may be connected to our sample of business groups because these firms do not provide audited data, and have no reliable market valuations, which would not allow us to observe investments and internal capital flows of business groups.

Control motivations of families are starkly different to those of governments and corporations. Faccio, Masulis, and McConnell (2006) show that politically-connected firms are more likely to receive government bailouts and obtain loans at favorable

terms. Burkart et al. (2003) present a model to show that family firms are primitively motivated by preservation of control especially when the amenity benefits such as family reputation is high. To ensure that the heterogeneity of control motivations of business groups is not driving the results, we remove from the entire sample all firms belonging to non-family business groups including those controlled by governments, corporations, and banks (e.g. cross-held Keiretsu) such that our control sample of standalone firms consists strictly of firms not connected to any type of business group. Henceforth, "group-affiliated firms" refers to firms affiliated only to family-controlled business groups.

We obtain all the financial and accounting data from the Thomson Reuters Datastream database for the sample period 2004 to 2010. Firms with Standard Industry Classification (SIC) codes 6000–6999, negative cash, negative assets, negative book value of debt, negative common equity, and cash-to-asset ratio greater than 1 are removed from the sample. Lins et al. (2013) also remove firms with total assets less that US$10 million. This blanket threshold to exclude small firms is probably too high especially for firms in the emerging markets, and consequently, useful data might be lost. To avert this problem, we remove firms with total assets ranked in the lowest 5^{th} percentile in each country. Our final sample consists of 17,688 non-financial firms from 45 countries; 2,863 firms are affiliated to family business groups while the rest are standalones.

Table 2.1: Country-Level Statistics

The table shows the breakdown of 17,688 non-financial firms from 45 countries in our sample. Firms are categorized as group-affiliated if they are identified as sharing common ownership linkages with other firms to form business groups. The business group ownership linkages are constructed on December 2007, prior to the onset of the 2008–2009 GFC. The total number of group-affiliated firms is 2,863, which is about 16.2% of the sample.

	Firms by number			Firms by percentage	
Country	Total	Group-affiliated	Standalone	Group-affiliated	Standalone
Argentina	57	19	38	33%	67%
Australia	893	57	836	6%	94%
Austria	48	3	45	6%	94%
Belgium	70	18	52	26%	74%
Brazil	228	58	170	25%	75%
Canada	877	58	819	7%	93%
Chile	121	60	61	50%	50%
Colombia	25	13	12	52%	48%
Czech Republic	11	0	11	0%	100%
Denmark	89	11	78	12%	88%
Finland	108	9	99	8%	92%
France	507	77	430	15%	85%
Germany	543	81	462	15%	85%
Greece	234	45	189	19%	81%
Hong Kong	725	143	582	20%	80%
Hungary	15	1	14	7%	93%
India	528	218	310	41%	59%
Indonesia	247	84	163	34%	66%
Ireland	41	7	34	17%	83%
Israel	129	69	60	53%	47%
Italy	167	54	113	32%	68%
Japan	2,474	156	2,318	6%	94%
Korea	1,178	351	827	30%	70%
Malaysia	621	174	447	28%	72%
Mexico	83	21	62	25%	75%
Netherlands	104	20	84	19%	81%
New Zealand	71	4	67	6%	94%
Norway	114	31	83	27%	73%
Pakistan	74	33	41	45%	55%
Peru	81	25	56	31%	69%
Philipines	129	68	61	53%	47%
Poland	94	33	61	35%	65%
Portugal	45	6	39	13%	87%

(continued)

Table 2.1—*Continued*

Country	Firms by number			Firms by percentage	
	Total	Group-affiliated	Standalone	Group-affiliated	Standalone
Singapore	393	81	312	21%	79%
South Africa	180	20	160	11%	89%
Spain	87	24	63	28%	72%
Sri Lanka	101	56	45	55%	45%
Sweden	231	58	173	25%	75%
Switzerland	150	19	131	13%	87%
Taiwan	895	193	702	22%	78%
Thailand	300	118	182	39%	61%
Turkey	179	93	86	52%	48%
United Kingdon	925	49	876	5%	95%
United States	3,502	144	3,358	4%	96%
Venezuela	14	1	13	7%	93%
Total	17,688	2,863	14,825		

Table 2.1 shows the breakdown of group-affiliated and standalone firms by country. The Asia-Pacific region accounts for 64.5% of the total number of family business group firms in the sample while Europe, North America and South America account for 19.8% 8.0% and 6.2% respectively. Consistent with stylized facts on business groups, the prevalence of firms affiliated to family business groups in Asia is very apparent. More than 25% of firms in 12 out of the 16 Asian countries in the sample are group-affiliated. According to Standard and Poor's (S&P), 9 of those 12 countries are classified as emerging markets.

2.3.2 Empirical Strategy and Variables

We present two identification strategies to investigate the role of group-affiliation on corporate investment policies. The first strategy uses the GFC as an exogenous financial shock to distinguish the marginal effects of ownership structures on financing and investment decisions under different external capital market conditions. The

second identification strategy exploits differences in industry-wide responses to the GFC to construct an instrumental variable to test the causal effects of group affiliation. We describe our methodologies in further detail below.

2.3.2.1 The GFC as an Exogenous Shock

Our first line of inquiry examines whether there is heterogeneity in investment policy responses between group-affiliated and standalone firms in light of supply shocks to external capital due to the GFC. This will provide evidence of correlation between group affiliation and corporate investment levels. We apply the investment-cash flow sensitivity framework from the financial constraints literature pioneered by Fazzari, Hubbard, and Petersen (1988) and Kaplan and Zingales (1997), and specify the baseline investment-cash flow model as:

$$Invest_{i,t} = \alpha_0 + \alpha_1 CF_{i,t} + \alpha_2 Q_{i,t-1} + \boldsymbol{\Gamma' Controls} + \eta_i + \varepsilon_{i,t}, \tag{2.1}$$

where i indexes firm and t indexes time. $Invest$ and CF are a firm's net capital expenditures and own cash flow from operations (defined as sum of net income before extraordinary items and depreciation) scaled by beginning-of-period book value of total assets, respectively. Q is a proxy for investment opportunities calculated as the ratio of market value of assets to book value of assets measured at the beginning of the fiscal period. Market value of assets is the sum of book value of assets and market value of common equity less the sum of deferred taxes and book value of common equity. ***Controls*** is a vector of control variables measured at the beginning of the period consisting of cash and cash equivalents, property, plant and equipment (both scaled by contemporaneous book value of assets), leverage measured as book

value of debt to assets, and firm size as the natural log of market capitalization in U.S. dollars. η and ε are firm-fixed effects and error terms, respectively. To account for spurious outliers, all variables are "Winsorized" at the 99^{th} and 1^{st} percentiles. Table 2.2 shows the descriptive statistics of the main variables in this study.

Table 2.2: Descriptive Statistics

The table reports summary statistics of key variables used in subsequent empirical tests. Our sample period is from 2004 to 2010, amounting to 105,518 firm-year observations. *N* is the number of firm-year observations; *p25* is the 25^{th} percentile; *p75* is the 75^{th} percentile; and *Sd. Dev.* is the standard deviation. Panel A shows the statistics for the full sample of firms. Panels B and C show the statistics for the subsample of group-affiliated, and standalone firms, respectively. All variables are "Winsorized" at the 99^{th} and 1^{st} percentiles. Definitions of variables are detailed in the Appendix.

	N	Mean	p25	Median	p75	Sd. Dev.
Panel A: All firms						
Invest	105,518	0·061	0·012	0·032	0·070	0·090
CF	105,518	0·043	0·018	0·068	0·124	0·208
Q	105,518	1·503	0·870	1·117	1·601	1·288
Cash	105,518	0·170	0·044	0·110	0·230	0·181
Lev	105,518	0·111	0·000	0·056	0·180	0·138
PPE	105,518	0·572	0·235	0·509	0·833	0·412
Size	105,518	11·663	10·192	11·449	12·985	2·058
Panel B: Group-affiliated firms						
Invest	17,550	0·065	0·015	0·038	0·080	0·086
CF	17,550	0·089	0·040	0·081	0·139	0·136
Q	17,550	1·311	0·841	1·046	1·419	0·986
Cash	17,550	0·144	0·040	0·095	0·191	0·152
Lev	17,550	0·132	0·003	0·088	0·213	0·144
PPE	17,550	0·589	0·270	0·551	0·842	0·395
Size	17,550	12·267	10·738	12·166	13·699	2·045
Panel C: Standalone firms						
Invest	87,968	0·060	0·012	0·031	0·068	0·091
CF	87,968	0·034	0·012	0·065	0·121	0·219
Q	87,968	1·540	0·876	1·132	1·643	1·336
Cash	87,968	0·176	0·045	0·113	0·238	0·186
Lev	87,968	0·107	0·000	0·050	0·172	0·136
PPE	87,968	0·568	0·227	0·499	0·831	0·415
Size	87,968	11·546	10·106	11·316	12·821	2·040

To investigate whether investment strategies of group-affiliated firms are less sensitive to a structural change in external funding conditions than those of standalone firms due to the former firms having additional sources of internal capital, we employ

the difference-in-differences (DID) estimator to estimate the differences in investment-cash flow sensitivities between group-affiliated and standalone firms before and during the GFC. We define the dummy variable GFC, which takes a value of 1 to denote observations during the GFC period from years 2008 to 2009, and 0 otherwise. Therefore, years 2004 to 2007 is the pre-GFC period. *Group* is a dummy variable for group-affiliated firms. The DID estimates are obtained by interacting these two dummy variables with CF in Equation (2.1). The model specification is thus

$$\begin{aligned} Invest_{i,t} = \beta_0 &+ \beta_1 CF_{i,t} \times Group_i \times GFC_t + \beta_2 CF_{i,t} \times Group_i + \beta_3 CF_{i,t} \times GFC_t \\ &+ \beta_4 CF_{i,t} + \beta_5 Group_i \times GFC_t + \beta_6 GFC_t + \beta_7 Q_{i,t-1} + \boldsymbol{\Gamma' Controls} \\ &+ \eta_i + \varepsilon_{i,t}, \end{aligned} \tag{2.2}$$

which strictly adheres to the methodology in Brambor, Clark, and Golder (2005) with all constitutive interaction terms included, except for *Group*, which is co-linear to firm-fixed effects. Pre-GFC, the investment-cash flow sensitivities of group-affiliated and standalone firms are given by $(\beta_2 + \beta_4)$ and β_4, respectively. During the GFC, the investment-cash flow sensitivities of group-affiliated and unaffiliated firms are given by $(\beta_1 + \beta_2 + \beta_3 + \beta_4)$ and $(\beta_3 + \beta_4)$, respectively. Therefore, β_2 and $(\beta_1 + \beta_2)$ are the differences in sensitivities in the pre-GFC and GFC periods, respectively. And, the difference of those differences in the two periods is thus β_1. If β_1 is negative and statistically-significant, then the hypothesis that internal capital markets exist in family business groups and serve to alleviate constraints in external capital supply during the financial crisis holds.

It is important to highlight that the Fazzari et al. (1988) framework has been

subject to many econometric criticisms. These include the endogeneity and non-monotonicity issues associated with sorting firms according to their external capital constraints (see Kaplan & Zingales, 1997), and the error-in-variable problems from using *average* Q to proxy for *marginal* investment opportunities. Our methodology overcomes the first issue as our sorting method is unlikely to be endogenous; a firm's ownership linkage status is unlikely to change in anticipation of a shock to external funding constraints such as the GFC, and the GFC itself is arguably exogenous to corporate investments. The second issue can be resolved through recent econometric advances. Most notably, Erickson and Whited (2000) propose a GMM estimation method based on high-order moments of regression variables. However, Almeida, Campello, and Galvao (2010) find that in the presence of firm-fixed effects, which our statistical model also includes, this method does not perform as well as simpler instrumental variable models with long lags of Q as instruments.

2.3.2.2 Instrumental Variables Approach

Our second line of inquiry focuses solely on group-affiliated firms to investigate how investments by each firm are affected by the cash flows of its affiliates in the same group. This would provide direct evidence on the functioning of internal capital markets within business groups, especially during weak external capital market conditions. Lee, Park, and Shin (2009) conduct a similar study of internal capital markets in Korean *chaebol* during the 1997 Asian Financial Crisis by examining the sensitivity of investments of group-affiliated firms to the cash flows of *other* firms within the same business groups through estimating Equation (2.2) on a subsample of group-affiliated firms. Their analysis is limited to providing evidence of an *association* of within-group investments and cash flows, but not a *causal* relationship. We develop

an instrumental variable approach as our identification strategy to establish causality.

Consider a family business group with two firms, A and B. Suppose firm B experiences a shock to its operating cash flows, which affects the investment expenditures of firm A. If the earnings shock to firm B is exogenous, then we could show evidence of causality between firm B's cash flows and the investments of firm A. In extant investigation on internal capital markets of business groups, the standard econometric technique is to regress the investment expenditures of firm A on the cash flows of firm B. This test is able to establish an association of investments and cash flows within groups, but is unable to show that group affiliation is the cause of internal capital flows to support group member firms' investments because firm B's cash flows are very likely endogenous to the investments of firm A. Therefore, we need an instrument that is correlated to the investments of firm A only through the shocks to the cash flows of firm B.

We define earnings shocks of firm B as the percentage change in its median operating cash flows from the pre-GFC period (i.e. 2004–2007) to its cash flows post-GFC (2008–2010) period, $\Delta Perf_B$. We define the instrument for $\Delta Perf_B$ as the percentage change in the industry's median operating cash flows from the pre-GFC period to post-GFC period (where the industry is that of which firm B operates in) less the percentage change in firm A's industry median cash flows in the same time period, $\Delta Ind_B - \Delta Ind_A$. We further enforce the following conditions in our construction of the instrumental variable to eliminate confounding effects on the validity of our instrument: (i) firm A and B must operate in different industries, (ii) the change in the industry median cash flows in which firm B operates in is calculated at the country-level, and (iii) ΔInd_B and ΔInd_A are calculated based

on excluding group-affiliated firms in the same industry-country as firms B and A, respectively.

We use the Standard Industry Classification (SIC) codes as the basis to define our industry groupings. However, the weakness of the SIC system is there may be substantial overlaps in operational activity across industries, especially at the higher levels (i.e. 2-digit SIC codes). Significant improvements to industry classification for U.S. firms have been proposed by Hoberg and Phillips (2010, 2013), who analyze product description texts of firms to group them together in a way that maximize within-industry similarities. This data is unfortunately unavailable for international firms. Therefore, to produce industry groups that are as distinct from one another as possible given our data constraints, we apply a simple mapping between SIC and the Hoberg and Philips (HP) data. The HP dataset[7] consists of 12,406 U.S. firms, which are grouped into 50 different industries according to the HP classification system. Each new industry is assigned a Fixed Industry Classification (FIC) code, which ranges from 1 to 50. Since each of the 12,406 firms has a 4-digit SIC code, our goal is to produce a distinct mapping of 4-digit SIC codes to FIC codes. For situations in which a single 4-digit SIC code produces several FIC codes, we take the mode of the FIC codes to yield a distinct mapping. If there are 4-digit SIC codes that are not mapped to FIC codes in the HP dataset, we use the first two digits of these SIC codes to find an equivalent mapping using the same procedure. We eventually arrive at an industry classification system based on FIC codes, which we believe would allow us to compute industry earnings shocks that are less correlated to one another such that our instrumental variable is a more valid instrument for the shocks to the operating cash flows of a firm in a FIC industry.

[7]This data is available for public downloads at http://alex2.umd.edu/industrydata/

We estimate the following model for a subsample of diversified group-affiliated firms:

$$\Delta Invest_i = x_0 + x_1 \Delta CF_i + x_2 \Delta Q_i + x_3 \Delta Perf_j + \boldsymbol{\Gamma' \Delta Controls} + \varepsilon_i, \quad (2.3)$$

where firms $i \neq j$; firms i and j have different FIC codes; ΔCF_i is the percentage change in firm i's median operating cash flows from the pre-GFC period to the post-GFC period; $\Delta Perf_j$ is as previously defined; ΔQ_i is the percentage change in investment opportunities for firm i from the pre-GFC median period to the post-GFC period; $\boldsymbol{\Delta Controls}$ is a vector of percentage changes in the control variables cash reserves, leverage, firm size, and property, plant and equipment. All variables are also "Winsorized" at the 99^{th} and 1^{st} percentiles. For business groups with more than two firms, then $\Delta Perf_{j>1}$ is the weighted-sum (weighted by total assets) of percentage changes in the firms' median operating cash flows from the pre-GFC period to their cash flows post-GFC. Note that these firms can have different or the same FIC codes, but they must be different from the FIC code of the subject firm i.

2.4 Empirical Results

2.4.1 How Different are Group-Affiliated and Standalone Firms?

We begin with an analysis of median differences in the key firm characteristics of group-affiliated and standalone firms using the Wilcoxon sign-rank test. This test is suitable as one does not need to assume the median differences are normally

distributed, although it is necessary to assume the distributions are symmetric. Table 2.3 shows the differences in the medians of group-affiliated and standalone firms for each of the variables examined after matching the firms either by 2-digit SIC codes or size, and country of domicile.

Table 2.3: Median Differences between Group-Affiliated and Standalone Firms

The table reports the differences in medians for each of the key variables between matched samples of group-affiliated and standalone firms. We construct an industry-matched sample by matching each group-affiliated firm to a standalone firm that operates in the same industry (based on two-digit SIC code), and domiciled in the same country as the group firm. We construct a size-matched sample by matching each group affiliated firm to a standalone firm with a size (natural log of the firm's market capitalization in U.S. dollars) not more than 10% larger or smaller and domiciled in the same country. Definitions of variables are detailed in the Appendix. We test the significance of the difference in medians with the Wilcoxon sign-rank test. The asterisks ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

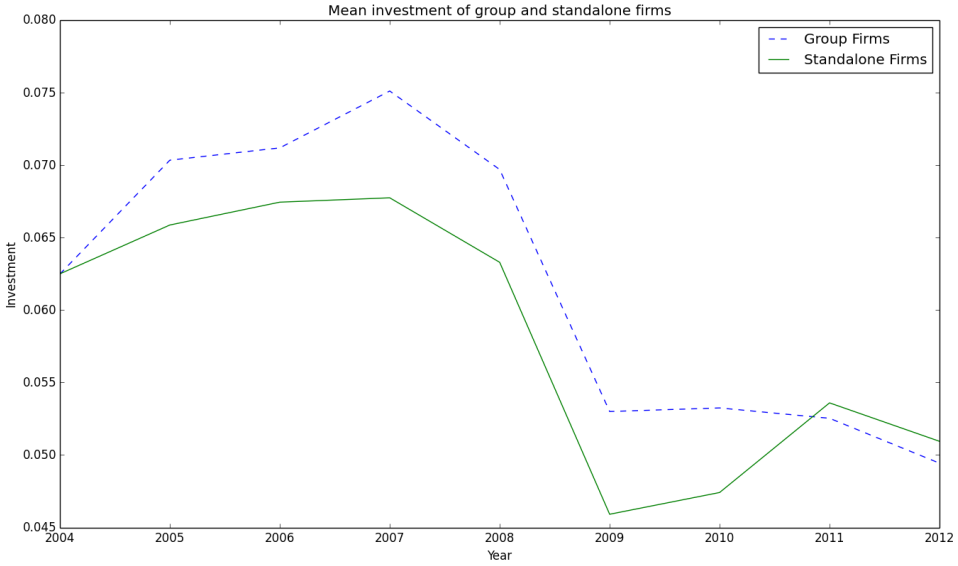
	Years: 2004–2010		Years: 2004–2007		Years: 2008–2009	
	Industry-matched	Size-Matched	Industry-matched	Size-Matched	Industry-matched	Size-Matched
Invest	0·004***	0·005***	0·001***	0·001***	0·006***	0·007***
CF	0·005***	0·006***	−0·0004***	0·0002***	0·019***	0·018***
Q	0·0006***	−0·009***	−0·021	−0·032**	0·028***	0·026***
Cash	0·004***	0·004***	0·005***	0·006***	0·003***	0·004***
Lev	0·014***	0·032***	0·012***	0·032***	0·010***	0·031***
PPE	−0·055***	−0·060***	−0·060***	−0·066***	−0·052***	−0·053***
Size	0·947***		0·948***		1·108***	

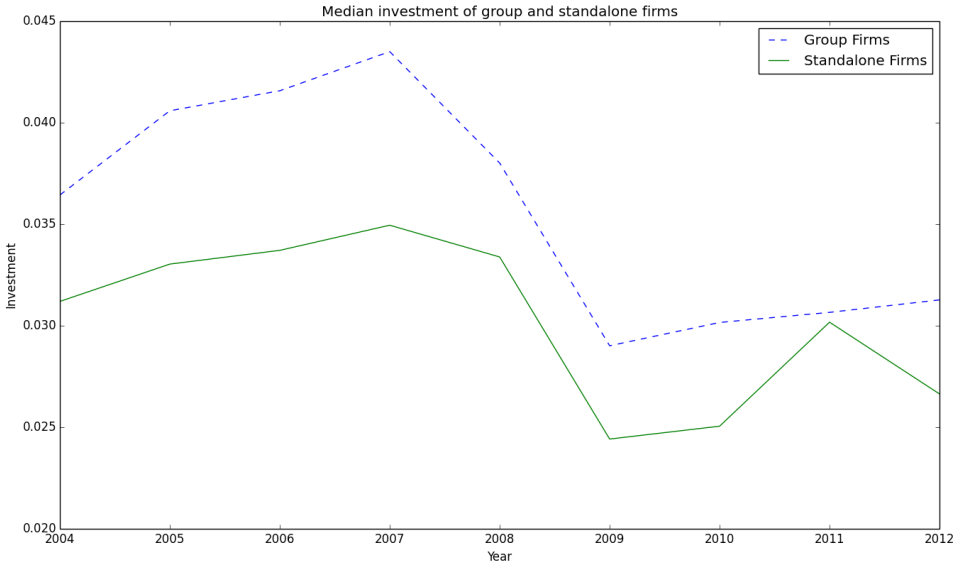
Additionally, we also plot the investment trends of group-affiliated and standalone firms from 2004 to 2012. The first graph in Figure 2.2 shows the mean investments of group-affiliated firms and standalone firms, while the second graph shows the median investments. It can be seen that both types of firms followed similar investment trends and experienced sharp declines during the GFC. However, from 2008 to 2009, the mean investments of group firms declined 23.9% while that of standalone firms declined 27.4%. In the same period, the median investments declined 23.7% and

26.9% for group and standalone firms, respectively.

Figure 2.2: Investment Trends

The figures show the investment trends of group-affiliated and standalone firms from 2004 to 2012. We define investment as capital expenditures scaled by beginning-of-period book value of assets. During the 2008–2009 GFC, the mean (median) investment of group firms declined 23.9% (23.7%) while that of standalone firms declined 27.4% (26.9%)





This evidence shows that group-affiliated firms cut investments by less than their standalone counterparts even during the GFC when external financing constraints are at the peak. Pre-GFC, the higher capital expenditures do not appear to be financed

by stronger operating cash flows. Moreover, while greater growth opportunities seem to be the driver of investments pre-GFC, group-affiliated firms continue to invest more despite facing fewer investment opportunities during the GFC.

Group firms also hold more cash, and although Opler, Pinkowitz, Stulz, and Williamson (1999) find that firms with better access to the capital markets tend to hold less cash, it is unlikely that group-affiliated firms hold more cash due to poorer access because they have higher leverages, which suggests they are able to borrow more. Thus, it could be group-affiliated firms build-up their cash reserves so that they are well-positioned to support other member firms. It is also interesting to note that despite being larger in size, group-affiliated firms have less property, plant and equipment as a ratio of total assets pre-GFC; in the GFC years, property, plant and equipment becomes more possibly as a consequence of consistently higher investment spending.

Similar to the comparative study in Masulis et al. (2011), Table 2.3 shows that group-affiliated firms are fundamentally-different from standalone firms in various dimensions after accounting for heterogeneity in industry and size. The results here suggest that group-affiliated firms are able to invest more, possibly due to the financial support of other business group members.

2.4.2 Evolution of Corporate Investments During the GFC

We first investigate whether the investment expenditures of a group-affiliated firm is less sensitive to the internal cash flows from its operations compared to those of standalone firms. If the internal capital markets within business groups perform a reallocation function, then we would expect the investment expenditures of group-

affiliated firms to be less sensitive to changes in external capital market conditions as a consequence of the GFC as indication that they are able to rely on within-group funding sources. We estimate equations (2.1) and (2.2) with a DID estimator to test this hypothesis.

Columns (1) and (2) of Table 2.4 show the results from a test of Equation (2.1). As expected, a firm's own cash flows and investment opportunities it faces are positively-correlated to its investments, and significant at the 1% level. Firms that are larger, and hold more cash reserves also invest more. Consistent with the theoretical prediction in Hennessy (2004) that debt-overhang disrupts firm investments, leverage is negatively-correlated with investments. Columns (3) and (4) present the baseline results. Group-affiliated firms show a pre-GFC investment-cash flow sensitivity of 0.122, which decreases by a magnitude of 0.0413 to 0.0808 during the GFC. Standalone firms show a pre-GFC sensitivity of 0.00807, which *increases* in magnitude to 0.0251 during the GFC. These results show that with the onset of constraints in the external capital supply during the GFC, group-affiliated firms become less sensitive to their own cash flows while standalone firms become more sensitive; the absolute difference in sensitivities is 0.0583, which is the coefficient of the triple-interaction term $GFC \times Group \times CF$ in column (3). After controlling for firm-specific characteristics, the absolute difference in sensitivities is 0.0483.

Table 2.4: Comparing Investment Sensitivity to Cash Flows between Group-Affliated and Standalone Firms

The table reports results of OLS regressions with the difference-in-differences (DID) estimator. The dependent variable is capital expenditures scaled by beginning-of-period book value of assets. *Q, Cash, Lev, PPE,* and *Size* are lagged by one year. Columns 1 to 4 show results from the full sample of firms. Columns 5 to 7 show results from a matched sample of group-affliated and standalone firms. We use the Abadie-Imbens matching procedure to match each group-affliated firm-year observation to one standalone firm-year observation based on the firm-specific variables in this table. We further enforce that each pair of matched firm-year observation is matched exactly in country, two-digit SIC, and year of observation. Columns 8 and 9 show results using a sample of firms excluding those domiciled in the U.S. Definitions of variables are detailed in the Appendix . All specifications include firm-fixed effects. The t-statistics are reported in parentheses. All results use robust standard errors clustered by firm. The asterisks ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Full sample				Matched sample			Excl. U.S. firms	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CF	0·0289***	0·0265***	0·00807***	0·0163***	0·0657***	0·0715***	0·0567***	0·0103*	0·0170***
	(7·022)	(6·435)	(4·282)	(3·345)	(21·67)	(13·72)	(11·11)	(1·701)	(2·799)
Q	0·00596***	0·00667***	0·00789***	0·00651***	0·0107***	0·00722***	0·0106***	0·00900***	0·00725***
	(10·61)	(11·73)	(27·19)	(11·53)	(26·08)	(17·87)	(25·72)	(13·28)	(10·27)
GFC ×			−0·0583***	−0·0483***		−0·0394***	−0·0408***	−0·0601***	−0·0475***
Group × CF			(−5·952)	(−3·350)		(−3·114)	(−3·371)	(−3·195)	(−3·008)
GFC ×		0·00218*	0·00971***	0·00774***	0·00498***	0·00899***	0·00910***	0·00973***	0·00788***
Group		(1·755)	(6·676)	(4·809)	(2·934)	(4·441)	(4·706)	(5·122)	(4·564)
GFC × CF			0·0170***	0·0126**		−0·0121*	−0·00998	0·0185**	0·0134*
			(6·409)	(2·329)		(−1·692)	(−1·462)	(2·557)	(1·892)
Group × CF			0·114***	0·0985***		0·0669***	0·0670***	0·112***	0·0963***
			(16·20)	(6·694)		(7·169)	(7·523)	(7·290)	(6·101)
GFC		−0·00904***	−0·00969***	−0·00963***	−0·00345***	−0·00376***	−0·00302***	−0·00957***	−0·00996***
		(−16·73)	(−18·73)	(−15·58)	(−3·412)	(−3·228)	(−2·714)	(−12·33)	(−13·44)

(continued)

Table 2.4—*Continued*

	Full sample				Matched sample			Excl. U.S. firms	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cash	0·0648***	0·0618***		0·0613***	0·0136***		0·0131***		0·0678***
	(14·05)	(13·49)		(13·42)	(4·672)		(4·479)		(12·57)
Lev	−0·0695***	−0·0694***		−0·0684***	0·102***		−0·102***		−0·0728***
	(−14·77)	(−14·84)		(−14·65)	(30·05)		(−30·14)		(−13·14)
PPE	−0·00443	−0·00698**		−0·00714**	0·0524***		−0·0522***		−0·00632*
	(−1·355)	(−2·124)		(−2·179)	(46·34)		(−46·23)		(−1·748)
Size	0·00496***	0·00556***		0·00567***	0·000394*		0·000381		0·00552***
	(7·515)	(8·534)		(8·706)	(1·675)		(1·619)		(7·585)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	93,339	93,339	95,587	93,339	41,151	41,151	41,151	79,408	77,523
Adj. R^2	0.032	0.032	0.017	0.039	0.110	0.025	0.112	0.018	0.040

One potential problem with our OLS regressions estimated above is that group firms (treated group) and non-group firms (control firms) are clearly different based on the covariates reported in Table 2.3. This could lead to a poor overlap between the distribution of the covariates of the treated sample and the control sample, which weakens our controls in the standard OLS regressions used to estimate equations 2.1 and 2.2. To deal with this problem, we follow the approach of Almeida et al. (2015) and Ozbas and Scharfstein (2010), and employ the Abadie and Imbens (2002) matching estimator methodology. Using this method we match each group firm as at the end of 2006 to standalone firms on firm-specific covariates reported in the regressions. we further ensure that each pair of observations is matched exactly by country and two-digit sic. by selecting control firms based on the closest matching covariates, we minimize the lack of distributional overlap that can confound standard ols regressions that employ the full sample of firms. in addition, while we have already matched on covariates we account for the possibility that these same covariates may evolve in differential ways over the crisis period, by including them as controls in our regressions. the results for this sample are consistent with our main analysis. We also conduct tests on a sample of firms excluding those domiciled in the u.s.[8] results from both sets of tests corroborate our results from the full sample.

These findings show that the investment expenditures of group-affiliated firms are less affected by external capital market conditions since despite external financing constraints during the GFC, their investments become less dependent on their own operating cash flows. This evidence is related to the arguments in Stein (1997) and Almeida and Wolfenzon (2006b) that centralized control in an internal capital

[8]in unreported further robustness test, we exclude firms from oecd countries and find results consistent with those from excluding only u.s. firms.

market allows investment projects to proceed, despite external funding constraints. Standalone firms on the other hand, without the funding support of internal capital markets through group affiliation adopt investment policies that are expected of firms when external financing is in short supply; they cut capital expenditures. To provide further evidence that there is correlation between within-group investments and cash flows, we test the sensitivity of investment expenditures of group-affiliated firms to the cash flows of *other* firms belonging to the same business groups by performing within-group OLS regressions of the model

$$Invest_{i,t} = \delta_0 + \delta_1 CF_{i,t} \times GFC_t + \delta_2 Group\_CF_{j,t} \times GFC_t + \delta_3 CF_{i,t} + \delta_4 Group\_CF_{j,t} + \delta_5 GFC_t + \delta_6 Q_{i,t-1} + \boldsymbol{\Gamma' Controls} + \eta_i + \varepsilon_{i,t}, \quad (2.4)$$

where $GroupCF$ is the sum of the cash flows of all firms in business group j excluding the cash flows of firm i, scaled by the beginning-of-period sum of total assets of all firms in the same group in a given year. Pre-GFC, the sensitivity of firm i's investments to the cash flow of its group affiliates is given by δ_4. During the GFC, this sensitivity is the sum of δ_2 and δ_4. Therefore, δ_2 estimates the difference in investment sensitivities to the affiliates' cash flows between the pre-GFC and during GFC periods. If resources are shared among firms within family business groups, then a firm's investments should be sensitive to the cash flows of other group member firms particularly during the GFC. Thus, δ_2 is expected to have a positive sign.

Columns (1) and (2) of Table 2.5 show that within business groups, each firm's investments are sensitive to the cash flows of other member firms with positive magnitudes of 0.0468, and 0.0549 when control variables are included, significant at the 1% level. These results suggest that overall, the investment policies of group-

affiliated firms are dependent on the operational performance of other member firms. Specifically, when other firms in the group are performing well, the group-affiliated firm is able to invest more. Additionally, this inter-dependence suggests the presence of functioning internal capital markets within business groups, which allows for cross-subsidization similar to that occurring in multi-segment diversified conglomerates. Shin and Park (1999) reach the same conclusion in their study of Korean *chaebol* firms. Given that group-affiliated firms share resources to support each other's investments, proper functioning of the internal capital markets should become even more important during the GFC. Columns (3) and (4) of Table 2.5 show the estimated coefficients of two interaction terms, $GFC \times GroupCF$ and $GFC \times CF$, which measure the differences in sensitivities pre- and during GFC. Within business groups, firms become more sensitive to the cash flows of other firms during the GFC and less sensitive to their own cash flows. This further confirms that when external capital supply is constrained, investments of group-affiliated firms become more dependent on the cash flows of other member firms, thus suggesting the increased importance of the internal capital markets within business groups.

Table 2.5: Investment Sensitivity to Cash Flows of Group-Affiliated Firms

The table reports results of OLS regressions examining the sensitivity of investment to cash flows of group-affiliated firms only. We use the DID estimator to examine the differential in sensitivity in the non-GFC and GFC periods. The dependent variable is capital expenditures scaled by beginning-of-period book value of assets. Columns 1 to 4 show results using the full sample of group-affiliated firms. Columns 5 and 6 show results using a using a sample of firms excluding those domiciled in the U.S. Columns 7 and 8 show results of the investment-cash flow sensitivity test when we interact a *Bank* indicator with *CF* and *Group_CF*. *Bank* is an indicator variable, which takes a value of 1 if the business group consists of a commercial bank (SIC code 6021, 6022, or 6029), and 0 otherwise. *Q, Cash, Lev, PPE,* and *Size* are lagged by one year. Definitions of variables are detailed in the Appendix . All specifications include firm-fixed effects. The t-statistics are reported in parentheses. All results use robust standard errors clustered by firm. The asterisks ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	All group-affiliated firms				Excl. U.S. firms		With bank indicator	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CF	0·113***	0·122***	0·125***	0·133***	0·126***	0·0832***	0·128***	0·136***
	(9·306)	(9·426)	(20·17)	(21·12)	(19·44)	(15·97)	(19·78)	(20·67)
Bank × CF							−0·0315	−0·0258
							(−1·387)	(−1·122)
Q	0·00725***	0·00846***	0·00728***	0·00852***	0·00718***	0·00711***	0·140 * *	0·150***
	(6·208)	(7·272)	(8·279)	(9·527)	(7·820)	(7·575)	(2·478)	(2·672)
GroupCF	0·0468***	0·0549***	0·0194**	0·0233**	0·0240**	0·0297***	0·0200**	0·0235**
	(2·716)	(3·180)	(2·102)	(2·524)	(2·329)	(2·782)	(2·118)	(2·489)
Bank × GroupCF							0·00840	0·0178
							(0·192)	(0·408)
GFC × CF			−0·0393***	−0·0407***	−0·0386***	−0·0750***	−0·0408***	−0·0417***
			(−4·428)	(−4·524)	(−4·171)	(−13·24)	(−4·421)	(−4·457)
Bank × GFC × CF							0·00568	0·00211
							(0·165)	(0·0610)
GFC × GroupCF			0·0311**	0·0282*	0·0263*	0·0274*	0·0135	0·00922
			(2·023)	(1·829)	(1·649)	(1·910)	(0·835)	(0·568)
Bank × GFC × GroupCF							0·140 * *	0·150***
							(2·478)	(2·672)
GFC			0·000437	−0·000869	0·00106	−0·00685***	0·000415	−0·000882
			(0·308)	(−0·603)	(0·716)	(−5·023)	(0·284)	(−0·597)
Bank × GFC							0·000254	8·98e−05
							(0·0395)	(0·0140)

Table 2.5—*Continued*

	All group-affiliated firms				Excl. U.S. firms		With bank indicator	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash		−0·0244**		−0·0238***		−0·0258***		−0·0236***
		(−2·478)		(−3·367)		(−3·512)		(−3·338)
Lev		0·0740***		0·0723***		0·0778***		0·0728***
		(5·387)		(9·501)		(10·000)		(9·564)
Property		0·0121*		0·0122***		0·0149***		0·0123***
		(1·841)		(3·071)		(3·637)		(3·072)
Size		0·00798***		0·00891***		0·0105***		0·00890***
		(3·072)		(6·094)		(11·15)		(6·085)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	15,677	15,437	15,677	15,437	15,060	14,767	15,677	15,437
Adj. R^2	0.040	0.054	0.041	0.056	0.040	0.049	0.043	0.057

In columns (5) and (6) we again exclude U.S. firms as a robustness check and find no changes to our previous interpretations.[9] We further examine if the investment of a group firm is more sensitive to the cash flows of the entire group for groups with a banking member. If the presence of a commercial bank acts to facilitate a more active redistribution of capital within a group then we should observe that the investments of members of such groups should be even more sensitive to the cash flows of other groups members. To test for this we include an additional banking group indicator (*Bank*, which takes a value of 1 if the FBG consists of a commercial bank, and 0 otherwise) and interact this with the existing double interaction terms ($GFC \times CF$, and $GFC \times GroupCF$) as well as including constituent interaction terms. The results in columns (7) and (8) indicate that the investment of firms in banking groups do have significantly higher sensitivity to the cash flows of the group, particularly during the GFC.

2.4.3 Capital Flows Within Business Groups

In this section, we investigate the functioning of internal capital markets in business groups by examining the directional flow of capital among member firms. Within each business group we identify two firms, one with the highest retained earnings-to-assets ratio, and the other with the lowest ratio at the beginning of the period. We denote the former type of firms as *capital-suppliers*, and the latter type as *capital-users*. If the internal capital markets of business groups play a reallocation function, then one should expect capital to flow predominantly from the capital-supplier to the user since the former has the most financial slack to provide capital. A capital-user firm

[9] In unreported further robustness test, we exclude firms from OECD countries and find results consistent with those from excluding only U.S. firms.

has the least financial slack and is thus the most likely candidate to require support from other member firms.

To test this conjecture, we regress the investments of the capital-user on its own cash flows, and the cash flows of the capital-supplier belonging to the same business group. The model is specified as

$$Invest\_CU_{i,t} = \theta_0 + \theta_1 CF\_CU_{i,t} + \theta_2 CF\_CS_{j,t} + \theta_3 Q\_CU_{i,t-1} + \theta_4 Q\_CS_{j,t-1} + \boldsymbol{\Gamma' Controls} + \eta_i + \varepsilon_{i,t}, \tag{2.5}$$

where variables with an underscore *CU* or *CS* denote the variable for the *capital-user* and *capital-supplier*, respectively. Only control variables for the capital-user are specified. Coefficient θ_2 measures the sensitivity of the capital-users' investments to the cash flows of capital-suppliers.

Columns (1) and (2) in panel A of Table 2.6 show the results of estimating Equation (2.5). The investments of capital-users are sensitive to the cash flows of capital-suppliers as hypothesized. As a further check on these findings, columns (5) and (6) in panel B Table 2.6 presents the results when we regress the investments of the *capital-supplier* on its own cash flows and the cash flows of the *capital-user*. Indeed, there is no statistical significance in the sensitivity of the capital suppliers' investments to the cash flows of the capital-users. The results here suggest that on average, the internal capital markets of business groups function rationally since capital appears to flow from firms that are well-positioned to provide capital to member firms who apparently need capital.

Table 2.6: Direction of Capital Flows within Business Groups

The table reports results of OLS regressions examining the direction of capital flows within business groups. For each business group, we identify two firms, the capital-user and the capital-supplier. The capital-user is the firm with the least retained earnings-to-assets ratio in the group, and the capital-supplier is the firm with the highest retained earnings-to-assets ratio in the group. Panel A reports results in which the dependent variable is the investments of the capital-user (Invest_CU). Panel B reports results in which the dependent variable is the investments of the capital-supplier (Invest_CS). Variables with an attached underscore CU (_CU) denote the variable for the capital-user; underscore CS (_CS) denote the variable for the capital-supplier. Definitions of variables are detailed in the Appendix . All specifications include firm-fixed effects. The t-statistics are reported in parentheses. All results use robust standard errors clustered by firm. The asterisks ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: Invest_CU			
Panel A	(1)	(2)	(3)	(4)
CF_CU	0·0547***	0·0570***	0·0733***	0·0597***
	(6·259)	(6·414)	(7·498)	(5·993)
Q_CU	0·00792***	0·00481***	0·00823***	0·00623***
	(5·734)	(3·473)	(5·891)	(4·435)
CF_CS	0·0444***	0·0418***	0·0337***	0·0329***
	(4·744)	(4·509)	(3·131)	(3·075)
Q_CS	−0·00121	−0·00178*	−0·000899	0·00104
	(−1·167)	(−1·731)	(−0·861)	(0·989)
GFC × CF_CU			−0·0681***	−0·0596***
			(−4·527)	(−3·977)
GFC × CF_CS			0·0329**	0·0333**
			(1·993)	(2·036)
GFC			−0·00265	−0·000108
			(−1·191)	(−0·0482)
Cash_CU		0·0716***		0·0619***
		(6·414)		(5·444)
Lev_CU		−0·0485***		−0·0272**
		(−4·215)		(−2·304)
PPE_CU		0·0116*		−0·000463
		(1·778)		(−0·0705)
Size_CU		0·0119***		0·0174***
		(8·565)		(7·373)
Firm FE	Yes	Yes	Yes	Yes
No. of obs.	5,352	5,242	5,352	5,242
Adj. R^2	0.034	0.070	0.040	0.070

(continued)

Table 2.6—*Continued*

	Dependent variable: Invest_CS			
Panel B	(1)	(2)	(3)	(4)
CF_CS	0·114***	0·110***	0·149*	0·133*
	(5·997)	(5·827)	(1·862)	(1·723)
Q_CS	0·00671***	0·00532***	0·00685***	0·00546***
	(3·525)	(2·764)	(3·485)	(2·773)
CF_CU	0·00208	0·00317	−0·0204	−0·0101
	(0·169)	(0·275)	(−0·265)	(−0·137)
Q_CU	−0·00178	−0·00225	−0·00168	−0·00207
	(−1·185)	(−1·408)	(−1·103)	(−1·280)
GFC × CF_CS			−0·0210	−0·0774
			(−0·144)	(−0·517)
GFC × CF_CU			−0·0223	0·0362
			(−0·156)	(0·247)
GFC			0·00136	−7·53e−06
			(0·525)	(−0·00291)
Cash_CS		0·0348**		0·0340**
		(2·355)		(2·287)
Lev_CS		−0·0569***		−0·0562***
		(−3·143)		(−3·100)
PPE_CS		0·0108		0·0104
		(1·035)		(0·978)
Size_CS		0·0112***		0·0118***
		(5·140)		(5·397)
Firm FE	Yes	Yes	Yes	Yes
No. of obs.	5,387	5,260	5,387	5,260
Adj. R^2	0.043	0.064	0.045	0.066

We further re-estimate Equation (2.5) by interacting CF_CU and CF_CS with the *GFC* dummy to examine any difference in sensitivity between pre-GFC and GFC periods, and show the results in columns (3) and (4). We repeat this test with the investments of capital-suppliers as the dependent variable and show the results in columns (7) and (8). We find that during the GFC, only the investments of capital users become less sensitive to their own cash flows, and more sensitive to the cash flows of capital suppliers. But, investments of capital suppliers do not show any significant sensitivities to the cash flows of capital users during the GFC. The results here confirms our previous finding that business groups utilize their internal

capital markets to allocate resources to support the investments of member firms, and firms with the least financial slack are probable beneficiaries of such allocations particularly during the GFC.

2.4.4 Channels of Resource Transfers Within Groups

The capital flows within business groups can be channeled through both debt and equity instruments. To examine which type of capital is utlized, we regress debt capital and equity capital on cash flow, investment opportunities, and control variables. We define debt capital as the amount of long term debt issuance less the reduction in long term debt, and equity capital as the net proceeds from the sale or issuance of common and preferred stock, both scaled by total assets. This line of inquiry also enables us to analyze the differences in ability of group-affiliated and standalone firms to raise capital conditional on severe constraints in the external capital markets. We hypothesize that given the GFC is largely associated with a "credit crunch", capital-raising activity during this period should take the form of equity.

In Table 2.7, the coefficient of the interaction term Group $\times$ GFC shows the difference in amount of capital raised by group and standalone firms from the pre-GFC to post-GFC period. As expected, the difference between group and standalone firms in the amount of debt capital raised is not statistically significant, which suggests that both types of firms are subject to similar constraints in raising debt. In column (2), the results show that group firms raise 2.2% more equity capital than standalone firms during the GFC. Next, we consider only SEOs. The SEO data is obtained from Thomson Reuters SDC, and we exclude all non-ordinary stock issuances, limited

Table 2.7: Capital-Raising Activity and Channels of Capital Support within Groups

The table reports results of OLS regressions examining the differences in capital-raising activity between group-affiliated and standalone firms. The dependent variables in columns 1 to 4 are a type of capital. Debt Capital is the amount of long term debt issued less the reduction in long term debt. Equity Capital is the net proceeds from the issuance of common and preferred stock. SEO is the proceeds from seasoned equity offerings. Group Equity Transfer is the amount of SEO proceeds that are block-purchased by a member firm belonging to the same group as the issuer. We define block-purchases as equal to or more than 5% of the SEO offering, but strictly less than 100% of the SEO offering. Thus, this variable identifies only within-group SEO activity. Column 5 reports results from a linear probability model with group and country fixed effects. The dependent variable is *Equity Transfer Indicator*, which takes a value of 1 if the within-group SEO activity is nonzero, and 0 otherwise. Definitions of variables are detailed in the Appendix. The asterisks ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Debt Capital	Equity Capital	SEO	Group Eq. Transfer	Eq. Transfer Indicator
	(1)	(2)	(3)	(4)	(5)
CF	0·00231	−0·107***	−0·254***	0·130***	−0·00317
	(0·267)	(−7·382)	(−5·256)	(3·253)	(−0·141)
Q	0·0119***	0·0410***	0·0765***	0·0763**	0·00847***
	(7·675)	(15·80)	(6·186)	(2·125)	(3·196)
Group × GFC	−0·00472	0·0223***	0·0622**		
	(−1·436)	(8·692)	(2·311)		
GFC	−0·00495***	−0·0347***	−0·0562***	0·0330*	0·00984**
	(−3·253)	(−21·22)	(−2·859)	(1·822)	(1·978)
CF × GFC					−0·0872**
					(−2·576)
Cash	−3·65e−05	−0·0223	0·738***	0·550***	−0·0615***
	(−0·00292)	(−1·222)	(6·955)	(2·589)	(−3·146)
Lev	−0·417***	−0·0661***	−0·263**	−0·331**	0·0878***
	(−23·53)	(−4·829)	(−2·377)	(−2·511)	(4·251)
PPE	0·0509***	0·0177	0·0793	0·178*	−0·00342
	(4·909)	(1·546)	(1·208)	(1·664)	(−0·431)
Size	0·00326*	−0·0257***	−0·0330**	−0·0532**	0·00382**
	(1·668)	(−11·32)	(−2·251)	(−2·437)	(2·258)
Firm FE	Yes	Yes	Yes	Yes	No
Group FE	No	No	No	No	Yes
Country FE	No	No	No	No	Yes
No. of obs.	61,786	75,081	8,710	915	12,723
Adj. R^2	0.040	0.053	0.093	0.286	0.180

partner interests, special warrants, and IPOs. We then scale proceeds from the SEO by the total assets of the firm. We argue that by focusing on non-dilutive secondary equity issuances, we can identify how group firms receive capital support from affiliated parent firms. In column (3), consistent with the evidence that group

firms raise more equity capital during the GFC, the results show that groups firms raise 6.2% more capital via SEOs than standalone firms.

In column (4), we focus only on a subsample of SEO transactions in which the issuer and the investor belong to the same group. Additionally, we impose the condition that the investor must purchase at least 5%, but strictly less than 100% of common stock issued in the SEO. This allows us to isolate within-group SEO transactions. The positive and significant coefficient on the *GFC* variable in show that within-group SEO activity increases during the GFC, and confirms our hypothesis that group firms utilize SEOs as a channel for within-group capital support. As a robustness check, we use a linear probability model to test the likelihood of a within-group SEO activity during the GFC. The dependent variable, *Equity Transfer Indicator* takes a value of 1 if the within-group SEO activity is nonzero, and 0 otherwise. In column (5), the positive and significant coefficient on *GFC* indicates that there is a higher probability of within-group equity transfers during the GFC.

2.4.4.1 Robustness Tests

As about 65% of group firms in our sample are domiciled in Asia, one could argue that our results are driven by Asian business groups, which are fundamentally different to business groups elsewhere. For instance, since 9 out of the 12 Asian countries in our sample of firms are classified as emerging markets, an alternative explanation for our results could be a market institution effect. The internal capital markets of business groups are merely a solution to weak market institutions unable to provide consistent external capital. This implies that the financing advantages of group affiliation is conditional on the strength of market institutions. To alleviate concerns

that this alternative story applies, we perform our baseline tests on a sample without Asian firms and show the results in columns (1) to (4) of Table 2.8. In columns (1) and (2), the coefficients on GFC × Group × CF continue to be negative and statistically-significant consistent with our previous results. And, within-group tests results in columns (3) and (4) show consistent results to our full sample, thereby confirming that non-Asian business groups also utilize their internal capital markets as a financing advantage.

The evidence so far shows active internal capital markets within business groups in which firms transfer resources to support the investments of group members particularly during the GFC as evidenced by the increased investment sensitivity to the cash flow of group affiliates. However, a plausible alternative explanation is the internal capital markets only function to *rescue* member firms in distress during the GFC, and do not consistently facilitate resource exchanges to support investments. To test this conjecture, we identify distressed firms in each business group and exclude them from the sample of group-affiliated firms and again perform within-group regressions of Equation 2.4. For each group-affiliated firm, we calculate the 2-year equity holding period return during the GFC from 2008 to 2009 using the firm's total return index[10]. A firm is classified as distressed during the GFC if its 2-year holding period return falls in the lowest 10^{th} or 20^{th} percentiles within a country. Columns (5) to (8) of Table 2.8 show the within-group regression results when distress firms at the lowest 10^{th} percentile are excluded from the sample.

[10]The return index (RI) data is from the Thomson Reuters Datastream database. Each firm's RI is the theoretical share value assuming that dividends are reinvested to purchase additional shares at the closing price on the ex-dividend date. Therefore, the 2-year holding period return during the GFC is the difference in RI between 2009 and 2008, divided by the 2008 RI.

Table 2.8: Robustness Tests

The table reports results of OLS regressions with different subsamples of firms. The dependent variable is capital expenditures scaled by beginning-of-period book value of assets. Columns 1 and 2 show results from our baseline comparison of differences in investment-cash flow sensitivity between group-affiliated and standalone firms excluding all firms domiciled in Asia. Columns 3 and 4 show results from tests of investment-cash flow sensitivity for group-affiliated firms excluding firms domiciled in Asia. Columns 5 to 8 show results from tests of investment-cash flow sensitivity for group-affiliated firms excluding distressed firms. We define a firm as distressed if its holding-period equity return during the GFC is in the lowest decile of equity returns among firms listed in the same country. The control variables include *Q, Cash, Lev, PPE*, and *Size*, all lagged by one year. Definitions of variables are detailed in the Appendix. All specifications include firm-fixed effects. The t-statistics are reported in parentheses. All results use robust standard errors clustered by firm. The asterisks ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Group-affiliated & standalone excl. Asian firms		Group-affiliated excl. Asian firms		Group-affiliated excl. distressed firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CF	−0·00359	0·00791***	0·0298***	0·0812***	0·112***	0·114***	0·0791***	0·0625***
	(−1·419)	(3·041)	(11·50)	(11·35)	(7·455)	(7·119)	(15·56)	(12·12)
Q	0·00660***	0·00621***	0·00789***	0·00625***	0·00661***	0·00638***	0·00106***	0·000795**
	(16·94)	(15·82)	(7·107)	(5·578)	(4·140)	(4·055)	(3·334)	(2·541)
GFC × Group × CF	−0·0366**	−0·0353**						
	(−2·292)	(−2·242)						
GFC × Group	0·0102***	0·00927***						
	(4·134)	(3·843)						
GFC × CF	0·0244***	0·0190***	−0·0422***	−0·0817***			−0·0652***	−0·0550***
	(6·869)	(5·344)	(−5·785)	(−9·040)			(−8·716)	(−7·394)
Group × CF	0·147***	0·140***						
	(12·96)	(12·46)						

(continued)

Table 2.8—*Continued*

	Group-affiliated & standalone excl. Asian firms		Group-affiliated excl. Asian firms		Group-affiliated excl. distressed firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GFC × GroupCF			0·0386∗	0·0376∗			0·0286∗	0·0289∗
			(1·927)	(1·889)			(1·690)	(1·728)
GroupCF			0·0416∗∗∗	0·0349∗∗∗	0·0512∗∗	0·0492∗∗	0·0291∗∗∗	0·0155
			(3·451)	(2·918)	(2·417)	(2·240)	(2·843)	(1·527)
GFC	−0·0126∗∗∗	−0·0111∗∗∗	−0·00130	0·00501∗∗∗			0·0286∗	0·0289∗
	(−16·83)	(−15·15)	(−0·761)	(2·782)			(1·690)	(1·728)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	43,604	42,007	4,987	4,800	11,545	11,332	11,545	11,332
Adj. R^2	0.020	0.046	0.025	0.047	0.036	0.055	0.029	0.068

Consistent with previous results, the positive and significant coefficients on *GroupCF* show that the investments of firms are sensitive to the cash flow of other group members throughout the sample period. This indicates that resources are transferred among firms not just for rescue purposes, but most likely as an invariant financing policy within business groups. In columns (7) and (8), the two interaction terms $GFC \times GroupCF$ and $GFC \times CF$ are included to show that investments of firms are less sensitive to their own cash flows and more sensitive to the cash flows of group-affiliates during the crisis, which also support results in Table 2.5. Taken together, these findings contravene the hypothesis that group-affiliated firms only rescue distressed member firms, and confirm the interpretation that internal capital markets of business groups continually allocate resources among firms.

2.4.4.2 Falsification Tests

One of the concerns with the results we have presented thus far is the investment sensitivity to cash flows for group and standalone firms are inherently different regardless of the availability of external capital. In other words, our selected GFC period of 2008–2009 has no exogenous effect on the differences in investment behavior of group and standalone firms, and the results cannot definitively elucidate the operation of internal capital markets in business groups. If this concern is valid, then we should get statistically-significant results for our baseline DID tests with alternate "GFC" periods. Otherwise, nonsignificant results with placebo GFC periods would prove that 2008–2009 indeed exerted external capital constraints and the differential impact on the investments of group and standalone firms can be attributed to functioning internal capital markets. We use two placebo GFC periods; 2006–2007, and 2010–2011. We selected two years prior to the actual 2008–2009 GFC as the

Table 2.9: Falsification Tests

The table reports results of OLS regressions using placebo GFCs and business groups. The dependent variable is capital expenditures scaled by beginning-of-period book value of assets. Columns 1 and 2 show results using a 2006–2007 placebo GFC. Columns 3 and 4 show results using a 2010–2011 placebo GFC. Columns 5 and 6 show results of investment-cash flow sensitivity tests on a sample of placebo group firms. For each real group-affiliated firm in our sample, we select a random standalone firm from the pool of standalone firms that operates in the same industry and domiciled in the same country as the group-affiliated firm and designate it as the placebo group firm. We repeat this process until all our real group-affiliated firms have a corresponding placebo group firm. We use the *actual* 2008–2009 GFC as the exogenous shock on this sample of placebo group firms. The control variables include *Q, Cash, Lev, PPE*, and *Size*, all lagged by one year. Definitions of variables are detailed in the Appendix. All specifications include firm-fixed effects. The t-statistics are reported in parentheses. All results use robust standard errors clustered by firm. The asterisks ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Placebo GFC: 2006–2007		Placebo GFC: 2010–2011		Placebo groups in actual GFC	
	(1)	(2)	(3)	(4)	(5)	(6)
CF	0·0224***	0·121***	0·0234***	0·120***	0·0419***	0·0441**
	(4·893)	(8·867)	(5·415)	(8·961)	(2·925)	(2·502)
Q	0·00551***	0·00784***	0·00451***	0·00818***	0·00682***	0·00697***
	(9·834)	(6·798)	(8·000)	(7·111)	(3·959)	(3·996)
GFC × Group × CF	−0·00689		−0·0115			
	(−0·454)		(−0·561)			
GFC × Group	0·00112		0·00177			
	(0·658)		(0·828)			
GFC × CF	−0·00517	−0·00820	−0·0208***	0·000139		−0·00774
	(−0·997)	(−0·565)	(−2·913)	(0·00695)		(−0·430)
Group × CF	0·0850***		0·0846***			
	(6·274)		(6·562)			

(continued)

Table 2.9—*Continued*

	Placebo GFC: 2006–2007		Placebo GFC: 2010–2011		Placebo groups in actual GFC	
	(1)	(2)	(3)	(4)	(5)	(6)
GFC × GroupCF		−0·00257		0·0154		−0·00723
		(−0·131)		(0·647)		(−0·526)
GroupCF		0·0460**		0·0556***	0·00824	0·00822
		(2·495)		(3·204)	(1·329)	(1·290)
GFC	0·00708***	0·00918***	−0·0112***	−0·0170***		−0·000544
	(10·74)	(5·090)	(−14·07)	(−7·912)		(−0·275)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	93,339	15,437	98,326	15,437	15,437	15,437
Adj. R^2	0.038	0.059	0.040	0.064	0.068	0.068

placebo because if firms are able to anticipate the 2008–2009 GFC to the extent that business groups begin reorganizing their structures shortly prior to the GFC, for example, acquire firms with greater growth opportunities such that higher capital expenditures follow, then using a placebo 2006–2007 GFC should catch firms by surprise such that there are significant differences in investment-cash flow sensitivity. We also use two years after the actual GFC as another placebo test to rule out the alternative story that there is a delayed response of investment behavior to external capital constraints such that the differential capital expenditures between the two types of firms should materialize only after the crisis. If this explanation is true, then our prior conclusion that internal capital markets provide group firms with a financing advantage during external capital constraints is invalidated.

Columns (1) and (2) show our DID results with the 2006–2007 placebo GFC, and columns (3) and (4) with the 2010–2011 placebo. The tests in columns (1) and (3) focus on the difference in investment-cash flow sensitivity between group and standalone firms during non-GFC and GFC periods. The variable of interest is GFC $\times$ Group $\times$ CF. While the coefficients are negative, showing that investments of group firms are less sensitive to their own cash flows in 2006–2007 compared to standalone firms, there is no statistical significance. In columns (2) and (4), the sample is restricted to group firms only to show within-group sensitivity. Similarly, the coefficients of the variable of interest GFC $\times$ GroupCF are not statistically-significant. Collectively, the evidence supports our arguments that 2008–2009 is an exogenous shock to external capital markets, and group firms rely on the internal capital markets to make more investments than standalone firms.

As a further robustness check, we also construct placebo groups by randomly

assigning a standalone firm that operates in the same industry and domiciled in the same country as a real group firm. We then test the within-group investment-CF sensitivity. In columns (5) and (6), the statistically nonsignificant coefficients on *GroupCF* show that investments of the subject firm are not sensitive to the placebo group cash flows. The evidence supports our hypothesis that group affiliation is a necessary condition for functioning internal capital markets.

2.4.5 Causal Effect of Group-Affiliation on Within-Group Capital Flows

As a next step, we perform our instrumental variable (IV) test of whether a firm's change in investment expenditures is caused by a change in the operating cash flows of other firms in the same group. We run regressions of Equation (2.3) and the variable of interest is $\Delta Perf_{j,t}$. If a change in a firm's investment level is due to a change in the cash flows of other firms within the same group, then we expect the coefficient to be positive. The positive and significant coefficients of $\Delta Perf_{j,t}$ support our conjecture that group affiliation causes the investments of firms to be sensitive to the cash flows of other firms in the same group. To test the validity of our instrument, we perform the Cragg-Donald F-test and report the statistics. As a mechanical rule, if the F-statistic is greater than 10, then we reject the null that the equation is weakly identified. Moreover, the Stock and Yogo weak identification test critical value at the 10 percent level is 16.38. Hence, the computed F-statistics also allow us to reject the Stock and Yogo null hypothesis.

Table 2.10 presents the results. The key interpretations of these results are firstly, within a group of connected firms, the investment expenditures of one firm is sensitive

Table 2.10: Causal Effect of Group-Affiliation on Within-Group Capital Flows

The table reports results of cross-sectional 2SLS IV regressions for a subsample of diversified business groups. The dependent variable is the percentage change in firm i's median capital expenditures from the pre-GFC (2004–2007) period to the post-GFC (2008–2010) period. The explanatory variable of interest is the percentage change in firm j's median capital expenditures from the pre-GFC period to the post-GFC period, $\Delta Perf_j$. Capital expenditures are scaled by beginning-of-period book value of assets. Firms i and j belong to the same business group, but operate in different industries. We use the Hoberg and Phillips (2010) 50 fixed industry classification (FIC) to sort firms into industries. The instrumental variable for $\Delta Perf_j$ is the earnings shock to the industry in which firm j operates in. We define industry earnings shock as the percentage change in the industry's median capital expenditures from the pre-GFC period to the post-GFC period. We compute the industry earnings shock at the country-level to account for country effects. We also exclude group-affiliated firms in the computation of the industry-country earnings shock to ensure that our instrumental variable is not confounded by any group-affiliation effect. ΔCF_i and ΔQ_i is the percentage change in firm i's median cash flows and investment opportunities (proxied by average Tobin's Q) from the pre-GFC period to the post-GFC period, respectively. Columns 1 and 2 show results of a test on the sample of diversified business group firms. Columns 3 and 4 show results of a test on a subsample of diversified business groups with a pyramidal group structure. Columns 5 and 6 show results of a test on a subsample of diversified business groups with a horizontal group structure. The control variables include $\Delta Cash_i$, ΔLev_i, ΔPPE_i, and $\Delta Size_i$. Definitions of variables are detailed in the Appendix. The z-statistics are reported in parentheses. All results use robust standard errors. The asterisks ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	All groups		Pyramidal groups		Horizontal groups	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta Perf_j$	0·0114**	0·0149**	0·0213***	0·0185**	0·0105	0·00801
	(2·071)	(2·308)	(2·760)	(2·028)	(1·270)	(0·883)
ΔCF_i	0·0952***	0·0451***	0·0384***	0·0353***	0·0496***	0·0485***
	(11·500)	(4·181)	(6·494)	(5·954)	(4·492)	(4·099)
ΔQ_i	0·0144***	0·0158***	0·0156***	0·0145***	0·0171***	0·0164***
	(9·601)	(9·027)	(6·872)	(5·810)	(6·982)	(6·440)
Cragg-Donald F Stat.	40·904	32·866	26·938	18·121	19·372	15·262
Controls	No	Yes	No	Yes	No	Yes
No. of Obs.	4,991	4,991	2,644	2,644	2,347	2,347

to the operating cash flows of its affiliates, and secondly, our causality test provides evidence that group-affiliation is the driver behind such internal transfers of capital to support investments. Therefore, corporate ownership linkages serve to mitigate liquidity shocks in the external capital markets brought about by financial crises such that the investment policies of group-affiliated firms are less affected by external funding constraints.

We extend our analysis further by examining whether alternative group structures

(i.e. pyramidal or horizontal) have different causal effects on capital support within business groups. Almeida and Wolfenzon (2006b) show in their theoretical model that groups utilize pyramidal structures to support capital-intensive member firms, which are usually located at the bottom of the pyramids. This conjecture is supported by empirical evidence in Masulis et al. (2011). Based on extant findings in the literature, we should expect to observe more significant effects of internal capital flows in pyramidal groups than horizontal groups. This is because in a horizontal group structure, the controlling family shareholder has direct equity stakes in each firm in the group. Therefore, even if one of the group firms require capital support, the most usual source is direct equity injection by the controlling shareholder. Thus, the investment expenditures of firms in horizontal groups are less dependent on the changes in cash flows of other member firms.

We perform regressions of Equation (2.3) with two subsamples of group-affiliated firms; those held in pyramidal structures and in horizontal structures. Columns (3) and (4) are results based on a subsample of pyramidal groups, while columns (5) and (6) are based on horizontal groups. The analysis shows that in pyramidal group structures, the change in a firm's investment level is caused by a change in the operating cash flows of other affiliated firms. Firms in horizontal group structures on the other hand do not show such interdependence.

2.4.6 Post-GFC Market Share and Stock Returns

We examine the post-GFC change in market share and stock returns for group-affiliated and standalone firms. Since group-affiliated firms were able to cut investments by less during the GFC due to the within-group capital support, we would

expect this to yield positive outcomes for group firms. Specifically, we examine the change in market share after the GFC and the 3-year holding period stock return from 2010 to 2012. We define market share as annual sales over total annual sales of the industry in which the firm operates in. The 3-year holding period stock return is the difference between the total return index of a firm in 2012 and 2010 divided by the 2010 return index. We then perform a cross-sectional OLS regression of the post-GFC change in market share and stock returns. We use the Hoberg and Phillips (2010) 50 Fixed Industry Classification code to sort firms into their industry sectors within each country and include industry dummies in our regression.

Columns (1) and (2) of Table 2.11 show the results for the full sample of firms. Group-affiliated firms increase their market share in the post-GFC period by 7.2% more than standalone firms. This evidence is consistent with the notion that group-affiliated firms benefited from the mitigated investment cuts during the GFC, which enabled them to capture a larger market share post-GFC compared to standalone firms. The result of an increased market share is reflected in the higher stock returns of group firms post-GFC in the magnitude of 6.3% as shown in column (2). We also create a matched sample of firms using the Abadie-Imbens (Abadie & Imbens, 2002) matching procedure and present the results in columns (3) and (4). The matching procedure ensures that our sample of group-affiliated firms are almost identical in terms of firm-level characteristics to a control group of standalone firms such that we can then claim that business group affiliation is the sole cause of any differences in post-GFC market share and stock returns between the two types of firms. We further show that the key beneficiaries of group affiliation are firms identified as the capital users. We repeat the tests on a subsample consisting standalone firms and

Table 2.11: Changes in Post-GFC Market Share and Stock Returns

Panel A of the table reports results of cross-sectional OLS regressions of post-GFC changes in market share and stock returns. The dependent variables are percentage change in market share and 3-year holding period stock returns from 2010 to 2012. We define market share as the firm's annual sales over the total annual sales of the two-digit SIC industry in which the firm operates. Columns 1 and 2 report results on a full sample of group-affiliated and standalone firms. Columns 3 and 4 report results on a matched sample of group-affiliated and standalone firms. We use the Abadie-Imbens procedure to match group-affiliated firms to standalone firms using the relevant firm-specific covariates shown in the table with exact matches for two-digit SIC and country. We create the match sample during the GFC. Columns 5 and 6 report results on a sample of group-affiliated firms identified as likely *Capital Users* and standalone firms. We define a capital user the firm with the least retained earnings-to-assets ratio in a group during the GFC. *Cap_User* is an indicator variable, which takes a value of 1 if the firm is a capital user group firm, and 0 otherwise. Panel B of the table reports results of the mean differences in post-GFC change in market share and 3-year holding period stock returns between a matched sample of group-affiliated and standalone firms. Panel B also reports the Abadie and Imbens (2006, 2011) matching estimator coefficients of the average treatment effect for the treated (ATT), where the treated group is group-affiliated firms and the control group is standalone firms. Definitions of variables are detailed in the Appendix. The t-statistics and z-statistics are reported in parentheses. OLS results use robust standard errors. The asterisks ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Full sample		Matched sample		Capital user	
	Mkt. share	Stock returns	Mkt. share	Stock returns	Mkt. share	Stock returns
	(1)	(2)	(3)	(4)	(5)	(6)
Cap_User					0·0553***	0·0341*
					(4·815)	(1·694)
Group	0·0724***	0·0630*	0·0648***	0·0693*		
	(3·943)	(1·759)	(3·587)	(1·941)		
Size	0·114*	0·0142**	0·113 * *	0·00626	0·0875***	0·0107***
	(1·951)	(1·972)	(2·025)	(0·860)	(4·164)	(3·723)
Lev	0·0631	0·0450	−0·0488	−0·00205	−0·00927	0·0603
	(0·929)	(0·416)	(−0·893)	(−0·0200)	(−0·396)	(1·477)
Cash	0·0586	0·0488	0·186 * *	−0·235***	0·180***	−0·119***
	(0·779)	(0·607)	(2·508)	(−2·951)	(6·526)	(−3·838)
Book-to-Market	0·0214***	0·0770***	−0·00709	0·0118	0·0240***	0·0257***
	(2·623)	(5·225)	(−1·062)	(0·902)	(7·563)	(4·097)
Age	−0·00653***		−0·00608***		−0·00552***	
	(−9·790)		(−9·181)		(−23·24)	

(continued)

Table 2.11—*Continued*

	Full sample		Matched sample		Capital user	
	Mkt. share	Stock returns	Mkt. share	Stock returns	Mkt. share	Stock returns
	(1)	(2)	(3)	(4)	(5)	(6)
Momentum		0·0763**		0·0660**		0·0470***
		(2·575)		(2·213)		(4·117)
Beta		−0·00918		−0·0103		−0·0100***
		(−1·300)		(−1·474)		(−3·586)
Liquidity		1·166		1·271		1·365***
		(0·980)		(1·069)		(2·959)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	No	Yes	No	Yes
No. of obs.	11,111	10,142	3,760	3,144	10,128	9,296
Adj. R^2	0.030	0.068	0.010	0.057	0.036	0.060

Panel B: Mean differences in market share and stock returns

	Mkt. share	Stock returns
Group-affiliated firms	0·292	0·241
Standalone firms	0·228	0·054
Difference	0·064***	0·187***
(t-statistic)	(3·566)	(5·610)
Matching Estimator (ATT)	0·079**	0·093*
(z-statistic)	(2·332)	(1·654)

group firms that are potential capital users. The positive and significant coefficients on *Cap_User*, a dummy variable for capital user firms, shows that the market share and stock returns of these firms increase more than standalone firms post-GFC. In panel B of Table 2.11, we report the coefficients of the average treatment effect for the treated (ATT) matching estimator for the post-GFC market share and stock returns. The positive and significant ATT coefficients confirm that group firms exhibit significantly larger market share and higher stock returns post-GFC compared to a control group of similar standalone firms.

Hitherto, the results support the hypothesis that internal capital markets within business groups exist and provide a medium for resource exchange among group-affiliated firms such that the firms are able to increase investment spending even when they face difficulties raising capital externally. In other words, the internal capital markets of business groups play a key role of supporting investment expenditures of member firms particularly in times of financial crisis, which is a financing advantage absent in standalone firms. Group-affiliated firms can continue to pursue strategic investment policies through resource-sharing to substitute for poorly-functioning external capital market institutions. This potential financing advantage is amplified during economic recessions, in which asset prices typically decline and present opportunities to invest at discounted prices. Group-affiliated firms can leverage on within-group capital and acquire discounted assets, while comparable standalone firms most likely have to pass-up on such investment opportunities due to a lack of external capital supply. Moreover, through our use of instrumental variables, we are able to establish the causal effect of change in member firms' cash flows on the change in the another member firm's investments brought about by group affiliation.

And, this causal effect is more significant in groups with pyramidal structures.

2.5 Conclusion

The primary innovation and significance of this study is the capability to directly assess the impact on corporate financing and investment policy as a consequence of the interactive effect of external market conditions and internal capital markets. The extensive cross-country data with clearly-identified group-affiliated firms also shed light on the complex relationship between corporate ownership and financing decisions. Business groups controlled by families utilize the internal capital markets to share resources and provide capital to support the investments of group member firms especially during financial crises when external capital supply is constrained. This provides a financing competitive advantage for group-affiliated firms unavailable to standalone firms. We argue that since it is unlikely for firms to anticipate the GFC to the extent that they change their ownership linkages ex-ante, the crisis provides a valuable exogenous setting to examine changes in investment policy often beset with endogeneity concerns in prior studies. Another key innovation in our study is the use of an instrumental variable as an identification strategy to establish causality of group-affiliation on within-group investment and financing policies.

The findings in this study support the conclusions of Boutin, Cestone, Fumagalli, Pica, and Serrano-Velarde (2013) who show that French business groups that are cash rich provide liquidity to member firms that face costly external financing, and Almeida et al. (2015) who show that Korean business groups use equity securities to channel cash from low to high growth firms to support investments. Also, related to the study of internal capital markets in Indian business groups by Gopalan, Nanda,

and Seru (2007) who find evidence of loan flows within groups to aid distress member firms with high bankruptcy risks, this study adds that internal capital markets function to continually support the investments of group-affiliates and not just for bail-out purposes. The important implication of this study is the implicit guarantee of supporting member firms is perhaps the key benefit of group affiliation, providing vital supplementary capital when external markets do not operate duly.

2.6 Appendix: Variable Descriptions

Variable	Description
Invest	Investments defined as the net capital expenditures scaled by beginning-of-period book value of assets.
CF	Own operating cash flows defined as the sum of net income before extraordinary items and depreciation and amortization scaled by beginning-of-period book value of assets.
Q	Proxy for investment opportunities measured by Tobin's q. It is the ratio of market value of assets to book value of assets. Market value of assets is the sum of book value of assets and market value of common equity less the sum of deferred taxes and book value of common equity. In empirical tests, Q is lagged one period relative to the dependent variable.
Cash	Cash and short term investments equivalent to cash scaled by contemporaneous book value of assets. In empirical tests, Cash is lagged one period relative to the dependent variable.
PPE	Property, plant and equipment scaled by contemporaneous book value of assets. In empirical tests, PPE is lagged one period relative to the dependent variable.
Lev	Leverage defined as the ratio of book value of debt to book value of assets. In empirical tests, Lev is lagged one period relative to the dependent variable.
Size	Firm size measured as the natural logarithm of market capitalization in U.S. dollars. In empirical tests, Size is lagged one period relative to the dependent variable.

(continued)

Appendix—*Continued*

Variable	Description
GroupCF	The sum of the operating cash flows of all firms in the same business group excluding firm i, scaled by the beginning-of-period sum of book value of assets of all firms in the same group in year t.
GFC	Dummy variable for during GFC period. GFC takes on a value of 1 if the observation is from 2008 to 2009, and 0 otherwise.
Group	Dummy variable equals to 1 if the firm is affiliated to a business group, and 0 otherwise.

CHAPTER 3

FUNDING DISCLOSURES, INFORMATION ASYMMETRY, AND THE COST OF CAPITAL

3.1 Introduction

Firm managers are responsible for structuring the firm's financing policies. Very often, these policies are made with information to which outsiders are not privy. This creates informational asymmetries that can impair the efficiency of capital markets. Not surprisingly, investors attribute firms with high asymmetric information as riskier, and consequently charge a higher cost of capital relative to firms with greater informational transparency. Regulators have attempted to improve market function through specific informational disclosure mandates in corporate annual reports. In the U.S., SEC Regulation S-K requires managers to "separately describe internal and external source of liquidity" and "the anticipated sources of funds needed to fund [the firm's] commitments." These forward-looking statements are intended to provide the market with valuable information not inferable from accounting data about planned financial policies. This paper evaluates whether a firm's financing disclosure provides credible qualitative information that mitigates the adverse selection problem for investors, thereby reducing the firm's cost of capital.

To perform this analysis, we implement a grammatical Natural Language Processing (NLP) technique to precisely identify a firm's internal and external sources of liquidity. The technique examines the underlying grammatical structure of key sentences found in the "Liquidity and Capital Resources" section of 10-K filings. By focusing on the grammatical relationships among words, the technique improves upon conventional approaches used in the literature[1]. Keyword-style searches that

[1]Tetlock, Saar-Tsechansky, and Macskassy (2008) quantify the negative words occurring in news stories and examine the impact on stock returns. They use the conventional "bag-of-words" technique to measure the degree of negativity. Similarly, Jegadeesh and Wu (2013) measure the tone of 10-Ks based on both negative and positive words to examine its relation on market reaction. Loughran and McDonald (2014) describes a general methodology of analyzing qualitative information in financial disclosures using the Fog Index.

are often used to analyze firm disclosures, in essence, ignore context. For example, firms typically indicate that they have specific sources of funding to achieve desired objectives in the upcoming fiscal year. One firm might indicate that its "operations will be sufficient to fund the firm's financial obligations," while another states that it "intends to issue debt to fund operations." The funds related to operations are financial resource in the first sentence, but a financial obligation in the second. Naive keyword searches for the word "funds" will not be able to differentiate between these meanings. By focusing on the grammatical relationships among words, our technique is able to identify words and their context, ensuring that we are accurately capturing the underlying information in the firm's statements.

Upon identifying the key sentences that disclose financing policies, we classify the funding sources into eight categories; cash on hand, cash from operations, bank debt, other debt, equity, other issuance, asset sale, and unspecified. The eight categories of funding sources have very low pairwise correlations, which shows that our technique of identifying and classifying funding sources produces unique financial policy information with very little overlap. We further group the funding categories into internal and external sources of funds. The former comprises cash on hand and cash from operations, and the latter comprises bank debt, other debt, equity, and other issuance. We do this so we can separately examine the effects of intended use of internal funds and external funds on firm economics.

We first investigate whether the disclosure of funding sources contains credible business-relevant information above that which is found in accounting data. We do so by examining how specific firm outcomes that are most directly associated with the firm's financing policies are affected by the revelation of ex-ante funding

disclosures. Since a firm's planned internal and external sources of funds should determine how much external capital the firm needs to raise in the future, we expect measures of external capital to be significantly associated with these disclosures if they are indeed credible. We find that firms that expect to rely on more external funds subsequently raise significantly more external capital than those that planned to rely less on external funds. And, this result is robust to decomposing external funds separately into proceeds from seasoned equity offerings and net long term debt issuances.

To provide further evidence that the qualitative disclosures of financing policies are credible, we test the implications of planned funding sources on a firm's typical uses of funds. We argue that since internal and external sources of funds are key capital inputs to the firm's production function, the disclosure of funds acts as a precursor to the firm's expected investment activity. We expect firms with a greater number of funding sources to be better-positioned to finance projects. Therefore, a positive relationship between the number of funding sources the firm plans to rely on and the subsequent level of investment expenditure is a manifestation of the credibility of funding disclosures. We find firms that disclose more sources of external funds have subsequently higher capital and R&D expenditures. Moreover, disclosing additional external sources of funds have large economic effects on the amount of subsequent expenditures. For example, for every additional source of external fund a firm plans to rely on, the firm can expect to increase its capital expenditures by 33.1%.

Now that we have established the credibility and implications of funding disclosures, a natural question to examine is why would some firm managers reveal

more information on financing policies than others. While Regulation S-K compels firm managers to disclose funding sources, the specificity of which remains within the purview of managers themselves. They can choose to word their planned financing policies in vague generic terms while still complying with disclosure requirements. For instance, some disclosures simply state "management believes we have sufficient capital resources to fund expenditures" or "we expect to have adequate financing to meet our needs". Both these examples reveal unspecified sources of funding, which are unlikely to provide outsiders with adequate information about the firms' financing plans. Yet, there are other disclosures such as "we believe that our internally-generated funds, and borrowing capacity under our credit facility will be adequate" and "the company believes that its cash, and cash equivalents, funds from operations, and proceeds from debt issuances are sufficient", which detail the variety of funding sources the firm plans to rely on. Clearly, more detailed funding disclosures transfer more information to outsiders and are likely to be more helpful at alleviating information asymmetry. We should therefore, expect firms revealing more funding disclosures to be "rewarded" by the market with lower cost of capital.

Our finding shows that firms disclosing more sources of funding experience significant reductions to their cost of capital. For every one additional category of funds out of the eight that a firm reveals, the cost of capital is cut by 2.0%. Now, one could argue that the cost of capital is lower for firms with more funding sources because the market perceives firms with a larger diversity of sources as facing less financing uncertainty. Thus, the lower cost of capital simply reflects lower overall firm risk, which nullifies information asymmetry as an explanatory factor. We address this concern by examining firms that make no ex-ante disclosures that they intend

to rely on external sources of funding, and *yet* subsequently raise external capital in the following year. We use indicator variables to differentiate between two types of firms. First, our "treated" group of firms are those that make disclosures of their intent to raise external capital and our counter-factual or "control" group of firms are those that make no disclosures of their intent to raise external capital *at the time of filing 10-Ks*, but actually do so in the following fiscal period. Thus, in this experimental setup we are only concerned with isolating the effect of ex ante disclosures on subsequent cost of capital raising. The underlying reasons why some firms may choose to forgo disclosures, but yet raise capital later does not pertain to our study. Our results show that such firms have a cost of capital that is up to 6.6% *higher* than firms that disclose plans to raise external capital and then proceed to do so. The evidence strongly suggests that the differential in cost of capital is associated with the severity of the asymmetric information problem, which can be mitigated through funding disclosures.

Our unique application of NLP gives our study the advantage of using the richness of sentences to accurately evaluate the information content in qualitative disclosures, and mitigates problems of misinterpretations that are common in conventional textual analysis techniques. We are thus able to show that qualitative funding disclosures contain relevant and credible information because they directly affect the associated firm outcomes. This improves upon studies that infer the credibility of specific disclosures from the firms' stock price reactions, which raises questions whether such inferences are supported by theory. We also produce evidence suggesting that qualitative disclosures, and not just the accounting numbers, in annual reports play an important role in alleviating information asymmetry and can influence the firm's

cost of capital.

The remainder of the chapter proceeds as follows. In Section 3.2, we review related literature and develop our hypotheses. Section 3.3 describes our data and methodology. Section 3.4 details our empirical results. And, we conclude in Section 3.5. Variable descriptions are detailed in the Appendix in Section 3.6.

3.2 Hypothesis Development

Firm managers do not always disclose all the information they possess to the public, which creates an information asymmetry problem. And, if unresolved, informational differences between corporate insiders and outside investors can impede market efficiency (Akerlof, 1970). This motivates government agencies such as the SEC to set financial reporting requirements of public companies with the objective of facilitating information dissemination. But, even with enforcement of disclosure requirements, managers may misreport firm economics, or exploit regulatory loopholes to withhold certain information in order to serve their own self-interests. Therefore, the extent to which financial reports can reduce asymmetric information in capital markets hinges on the credibility, amount, and type of disclosed information.

Existing accounting research in this area produces indirect evidence to prove that investors gather credible and useful information from financial reports. They examine whether required reporting of specific accounting items in financial statements translate to stock price reactions. The premise is positive association between accounting information and stock price movements indicates that the market considers management's disclosures to be credible (Ajinkya & Gift, 1984; Waymire, 1984, 1986). Holthausen and Watts (2001) criticize these studies as lacking in theoretical priors

because the channels through which reported accounting items directly affect stock prices are not clearly established. Thus, even if there are statistically-significant associations between specific disclosures and stock prices, it could be erroneous to infer that the disclosures provide valuable information.

Another issue with these extant studies is they only examine quantifiable accounting items. For instance, Venkatachalam (1996) find that banks' share prices are affected by disclosures of fair values of derivative positions in accordance to the Statement of Financial Accounting Standards (SFAS) rule No. 119. The question whether the finding in these studies extends to non-quantifiable information has been hitherto, largely unanswered. Qualitative disclosures especially those in the Management's Discussion and Analysis (MD&A) section are prescribed by the Federal Accounting Standards Advisory Board as "required supplementary information". And, since they are meant to provide information that is not apparent in the financial statements, their credibility also warrants careful investigation.

Since the primary purpose of disclosures is to inform the public of firm activity, then examining the effects on firm outcomes that are *directly* associated with the specific information disclosed would reveal the information's credibility. For instance, firm managers who comply with SEC Regulation S-K will disclose their expected sources of internal and external funding. And, if these qualitative disclosures are credible, then one should be able to observe evidence from the firms' capital raising activity. Consider a firm that plans to rely more on internal, instead of external sources of funding. If this firm's funding disclosures are truthful, then one would expect it to raise less external capital than another firm that planned to rely more on external financing. This methodology directly tests the credibility of

qualitative disclosures and ensures that the subsequent inferences will not be confounded by extraneous factors. We use this approach to test our hypothesis as follows.

Hypothesis 1 *Qualitative disclosures in the MD&A section provide credible information, which forecasts firm-level capital-raising and investment activities.*

Credible qualitative disclosures transmit information to capital market participants and ease the severity of asymmetric information. Finance research postulates an association between the degree of information asymmetry and the firm's cost of capital. In an imperfect market in which the information asymmetry problem cannot be completely resolved, investors will demand a premium for holding informational risk (Myers & Majluf, 1984). Yet, even with incomplete information, theory shows that capital market equilibrium can still be achieved such that firms revealing less information will have higher risk premiums than those that reveal more information (Barry & Brown, 1984, 1985; Easley & O'hara, 2004; Merton, 1987).

This theory is corroborated by empirical evidence. For instance, Duarte, Han, Harford, and Young (2008) find that firms with a low probability of informed trading, in other words high asymmetric information, experience significant cost of capital increases. They use the conventional *PIN* measure, which is an estimated probability of occurrence of private events affecting the intensity of order flows to proxy for information asymmetry. But, because *PIN* fundamentally requires a strict binary assessment of information as either good or bad news, it could be exposed to measurement errors due to subjectivity. Thus, rendering it a less accurate proxy for information asymmetry.

We improve upon the measurement of information asymmetry by using a systematic and non-subjective approach to collect and interpret qualitative disclosures. Our choice of using disclosures offers a key advantage. Financial disclosures are a *direct* dissemination of information to the public. This is important because without a reliable channel to transmit information, investors would need to expend resources to gather information. And, since not all investors have equal ability to acquire information, the measurement of information asymmetry becomes obfuscated because it would be conjointly determined by the quantity of information firms disclose and the cost of acquiring it. The confluence of these two effects would make it difficult to infer a direct association between information revealed by managers and cost of capital.

Our measure of information asymmetry is a direct representation of the amount of qualitative information disclosed. This allows us to test how management's disclosure policies directly affect cost of capital. We base our hypothesis on theoretical predictions and formalize it as follows.

Hypothesis 2 *Qualitative disclosures mitigate asymmetric information and the more information a firm discloses, the lower the firm's cost of capital.*

We expect our investigation to show that the disclosure decisions by firm managers is intricately-linked to the firm's cost of capital. While much research has been done on the credibility and relevance of financial statements, we argue that qualitative disclosures are also informative and credible because they are an avenue for managers to transmit information not covered by the accounting numbers, and the threat

of litigation should disincentivize managers from falsifying them. Moreover, since management's qualitative disclosures are essentially a transformation of private information into public, the greater the quantity of disclosures, the lesser the severity of asymmetric information. We conjecture that in equilibrium, the market will attribute firms with higher transparencies with lower risks, and reward these firms with a lower cost of capital. This implies that firms that make ex ante disclosures of their intention to raise external capital should face lower cost of capital relative to a control group of firms that do not make disclosures of their intent to raise capital at the time of 10-K filings, but yet proceed to raise capital in the coming fiscal year. This is because the lack of disclosures on the possible need for external financing by the "control" group of firms may have misled the market to think that they have sufficient funding to support operations and investments for the coming year. Yet, when the control firms proceed to raise capital, it indicates that they may not have been as financially sound or as forthright about their financing and investment plans as they have initially led the market to believe. Thus, the market will reasonably consider such firms to exhibit greater informational asymmetry problems and levy a higher cost of capital relative to the treated group of firms.

3.3 Data and Methodology

3.3.1 Text Extraction of Funding Sources

Our empirical analyses that follow require careful consideration of the context of sentences. To do this, we wrote a program in Ruby that interfaces with the Stanford CoreNLP software, which is a computation linguistics algorithm designed to parse

sentences and identify the grammatical relationships among words. Our program then uses these grammatical relationships to classify the information content of the sentences into distinct categories. To see why this method supersedes rudimentary textual analysis techniques such as keyword searches, which have been frequently employed in past studies of qualitative disclosures, consider again the example given in Section 1. The sentences "operations will be sufficient to fund the firm's financial obligations" and "intends to issue debt to fund operations" produce the following grammatical relationships depicted in figures 3.1 and 3.2, respectively.

Figure 3.1: CoreNLP Example One

The figure shows a first example of the grammatical relationships among the words of a funding disclosure sentence produced by the Stanford CoreNLP program.

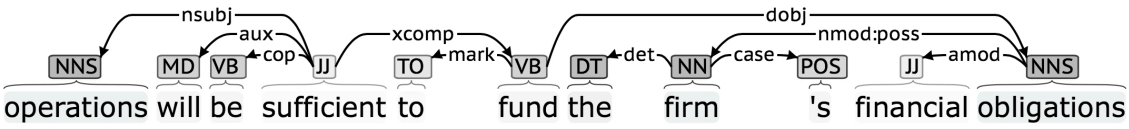
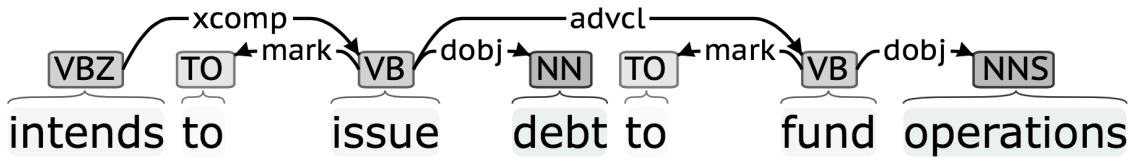


Figure 3.2: CoreNLP Example Two

The figure shows a second example of the grammatical relationships among the words of a funding disclosure sentence produced by the Stanford CoreNLP program.



The CoreNLP identifies "fund" as a verb (denoted as "VB" in the figures) in both sentences and are direct objects ("dobj") of the word "obligations" in the first sentence and "operations" in the second. But, in the first sentence, "fund" is complemented ("xcomp") by the adjective "sufficient" (denoted as "JJ"). This tells us that the word "fund" is actually more similar to a noun and it is sufficient for something. From here, it is easy to deduce "fund" as a financial resource. Whereas in the second sentence, "fund" is modified by the adverbial clause ("advcl") "issue",

which is a direct object of the noun "debt". In this case, since fund is modified by issuing debt, we can deduce that "fund" here represents a debt liability, and not a resource. Now, keyword search techniques will not have the technical sophistication to analyze sentences and their constituent words with such grammatical detail. And, very likely incorrectly identify "fund" as a financial resource in both sentences. Therefore, the application of our grammatical NLP technique is necessary to avoid systematic errors in identifying qualitative information.

After parsing the sentences from our sample through the CoreNLP software, our program then processes all the identified funding sources and classifies them into eight distinct types: "cash on hand", "cash from operations", "bank debt", "other debt", "equity", "other issuance", "asset sale", and "unspecified". As an illustration of what constitutes each of the funding types, Table 3.1 shows examples of phrases identified as funding sources from sentences parsed through the CoreNLP software.

Table 3.1: Categories of Funding Sources and Examples

The table shows the eight distinct types of funding sources and the associated examples of phrases identified from sentences parsed through the CoreNLP software. Our program then classifies the phrases into the funding source categories.

Funding Source Type	Example of Phrases
Cash on Hand	cash and cash equivalents cash reserves marketable securities short-term investments
Cash from Ops.	cash flow from operations cash generated from sales funds provided by operational activity internally generated funds operating cash flow
Bank Debt	bank credit facility bank overdraft agreement revolver/revolving credit facility
Other Debt	access to private/public debt markets issuance of debt (notes/bonds) stand by commitment term funding uncommitted facilities
Equity	access to private/public equity markets cash available through equity markets issuance of stock public stock offering sale of warrants
Other Issuance	issuance of debt or equity securities public offering sale of securities securitization
Asset Sale	property sales real estate assets sale of property/real estate

(continued)

Table 3.1—*Continued*

Funding Source Type	Example of Phrases
Unspecified	available liquidity capital/financial resources external sources of liquidity other financing arrangements

Next, we prove that our classification of funding sources is largely able to produce distinct types of sources, which is important for analyses requiring accurate identification of internal and external sources of funds. Table 3.2 shows the Pearson pair-wise correlation coefficients for all eight types of funding sources. Other than the correlation between bank debt and cash from operations, unspecified and cash on hand, and unspecified and cash from operations, all the other correlation coefficients are less than 10%. This shows that our computation linguistics methodology underpinned by CoreNLP is capable of extracting distinct information from the qualitative disclosures for more accurate analysis.

Table 3.2: Pearson Correlation Matrix of Types of Funding Sources

The table reports the Pearson correlation coefficients between the 8 distinct types of funding sources we have identified from textual analysis of the "Liquidity and Capital Resources" section of 10-K filings. *COH* is Cash on Hand; *CFO* is Cash from Operations; *BD* is Bank Debt; *OD* is Other Debt; *EQ* is Equity; *OI* is Other Issuance; *AS* is Asset Sale; and *USP* is Unspecified. The 8 types of funding sources are indicator variables each taking a value of 1 if the firm's funding disclosure indicates availability of that type of funding source, and 0 otherwise.

	COH	CFO	BD	OD	EQ	OI	AS	USP
COH	1·000							
CFO	−0·084	1·000						
BD	−0·022	0·042	1·000					
OD	−0·090	0·254	−0·084	1·000				
EQ	−0·013	−0·054	−0·011	−0·032	1·000			
OI	−0·001	−0·006	0·002	0·024	−0·007	1·000		
AS	−0·006	0·020	−0·004	0·029	−0·003	−0·002	1·000	
USP	−0·293	−0·162	−0·017	−0·023	0·014	0·024	0·000	1·000

3.3.2 Construction of the Fund Sources Indices

We use the eight fund source categories to construct firm-year indices for funding sources. For every firm in a given year, we create an indicator variable for each of the eight fund source categories that takes a value of 1 if the firm-year observation shows availability of the particular funding source. We then take the sum of the fund source indicator variables and scale it by 8 to create a *composite fund source index*, which ranges from 0.125 (only one type of funding source available) to 1 (fully-diversified funding sources available). We further construct two indices, *internal fund source index* and *external fund source index* to separately identify the availability of internal and external funding sources. The *internal fund source index* is the sum of the indicator variables for COH and CFO divided by 2. The *external fund source index* is the sum of the indicator variables for BD, OD, EQ, and OI divided by 4.

The internal and external fund source indices are constructed so that we can examine the separate marginal effects of these two distinct categories of funding on the outcome variables. The correlation coefficient between these indices is 0.104, which is sufficiently low and should alleviate concerns of collinearity when they are both included in subsequent empirical specifications. Also, note that all our indices give equal weight to the various types of funding sources based on the assumption that firms can readily access any of their disclosed source of funds. According to SEC Regulation S-K, there are no requirements for firms to rank the relative importance of the variety of funding sources either based on amount or liquidity. Thus, we contend that giving equal weight to each source is reasonable.

Table 3.3: Distribution of Mean Fund Source Indices by Industry

We sort firms into two-digit SIC codes and compute the industry means of the composite fund source index, internal fund source index, and the external fund source index. The composite fund source index takes the sum of the indicator variables for the eight types of funding sources (cash on hand, cash flow from operations, bank debt, other debt, equity, other issuances, asset sale, and unspecified) and divided by 8. The internal fund source index takes the sum of the indicator variables for two types of internal funding sources (cash on hand and cash flow from operations) and divided by 2. The external fund source index takes the sum of the indicator variables for four types of external funding sources (bank debt, other debt, equity, and other issuances) and divided by 4.

SIC	Industry	Comp. Fund Index	Int. Fund Index	Ext. Fund Index
01	Agricultural production crops	0.297	0.531	0.203
02	Agriculture producting livestock and animal specialities	0.125	0.500	0.000
07	Agricultural services	0.388	0.900	0.200
08	Forestry	0.125	0.500	0.000
10	Metal mining	0.214	0.594	0.042
12	Coal mining	0.273	0.651	0.160
13	Oil and gas extraction	0.264	0.547	0.138
14	Mining and quarrying of nonmetallic minerals, except fuels	0.246	0.547	0.172
15	Building construction general contractors and operative builders	0.248	0.472	0.173
16	Heavy construction other than building construction contractors	0.318	0.726	0.179
17	Construction special trade contractors	0.272	0.538	0.190
20	Food and kindred products	0.290	0.589	0.163
21	Tobacco products	0.225	0.450	0.100
22	Textile mill products	0.235	0.492	0.159
23	Apparel and other finished products made from fabrics and similar materials	0.291	0.648	0.183
24	Lumber and wood products, except furniture	0.331	0.765	0.181
25	Furniture and fixtures	0.263	0.529	0.149
26	Paper and allied products	0.221	0.505	0.139
27	Printing, publishing, and allied industries	0.262	0.593	0.150
28	Chemicals and allied products	0.213	0.501	0.070
29	Petroleum refining and related industries	0.213	0.449	0.081

(continued)

Table 3.3—*Continued*

SIC	Industry	Comp. Fund Index	Int. Fund Index	Ext. Fund Index
30	Rubber and miscellaneous plastics products	0.307	0.638	0.164
31	Leather and leather products	0.350	0.741	0.170
32	Stone, clay, glass, and concrete products	0.277	0.645	0.156
33	Primary metal industries	0.249	0.549	0.140
34	Fabricated metal products, except machinery and transportation equipment	0.253	0.563	0.141
35	Industrial and commercial machinery and computer equipment	0.268	0.638	0.129
36	Electronic and other electrical equipment and components, except computer equipment	0.255	0.628	0.107
37	Transportation equipment	0.252	0.532	0.134
38	Measuring, analyzing, and controlling instruments	0.241	0.605	0.098
39	Miscellaneous manufacturing industries	0.282	0.721	0.155
40	Railroad transportation	0.183	0.442	0.000
41	Local suburban transit and interurban highway passenger transportation	0.337	0.885	0.192
42	Motor freight transportation and warehousing	0.218	0.313	0.150
44	Water transportation	0.257	0.563	0.144
45	Transportation by air	0.237	0.552	0.071
46	Pipelines, except natural gas	0.208	0.500	0.083
47	Transportation services	0.261	0.659	0.109
48	Communications	0.266	0.653	0.124
49	Electric, gas, and sanitary services	0.268	0.571	0.153
50	Wholesale trade-durable goods	0.288	0.539	0.169
51	Wholesale trade-non-durable goods	0.269	0.502	0.175

(continued)

Table 3.3—*Continued*

SIC	Industry	Comp. Fund Index	Int. Fund Index	Ext. Fund Index
52	Building materials, hardware, garden supply, and mobile home dealers	0.242	0.467	0.130
53	Gerneral merchandise stores	0.277	0.560	0.177
54	Food stores	0.285	0.531	0.148
55	Automotive dealers and gasoline service stations	0.279	0.442	0.207
56	Apparel and accessory stores	0.277	0.682	0.162
57	Home furniture, furnishings, and equipment stores	0.277	0.626	0.148
58	Eating and drinking places	0.289	0.685	0.134
59	Miscellaneous retail	0.268	0.602	0.163
70	Hotels, rooming houses, camps, and oter lodging places	0.246	0.531	0.094
72	Personal services	0.270	0.636	0.149
73	Business services	0.243	0.682	0.087
75	Automotive repair, services, and parking	0.228	0.397	0.112
76	Miscellaneous repair services	0.292	0.833	0.167
78	Motion pictures	0.251	0.560	0.155
79	Amusement and recreation services	0.317	0.739	0.165
80	Health services	0.280	0.574	0.160
81	Legal services	0.357	0.929	0.250
82	Educational services	0.293	0.663	0.169
83	Social services	0.220	0.488	0.107
87	Engineering, accounting, research, management, and related services	0.268	0.587	0.140
99	Nonclassifiable establishments	0.125	0.063	0.000

Across all firms, the mean, median, and standard deviation of the composite, internal, and external fund source indices are 0.255, 0.250, 0.110; 0.604, 0.500, 0.329; and 0.119, 0, 0.130, respectively. Table 3.3 shows the means of each fund source index across the industries sorted by two-digit SIC codes in our sample. Firms in 50% of the SIC codes show a mean composite fund source index of more than 0.266, which is equivalent to approximately over two types of fund sources. The highest mean composite index of 0.388 (roughly three types of fund sources) is from the agricultural services industry while the lowest index of 0.125 (one type of fund source) is from the agricultural production, forestry, and non-classifiable establishments industries. For the internal fund source index, firms in 83% of the SIC codes have a mean index of greater than 0.5, which means they have at least one of the two types of internal funding sources. While for the external fund source index the highest mean is only 0.25 or one of the four types of external funding sources.

3.3.3 Main Variables

In the empirical analysis in the subsequent section, we conduct tests to show how the qualitative disclosure of funding sources impacts firms' financing and investment activities, and cost of capital. To construct dependent variables for the firms' financing activities, we follow closely the methodology in Almeida and Campello (2010) and define external financing as the sum of net equity and net debt issuances scaled by total assets. To uncover differential impacts on types of external financing, we further define equity financing and debt financing simply as proceeds from seasoned equity offerings scaled by total assets, and net debt issuances scaled by total assets, respectively. For the firms' investment activities, we scale capital expenditures and

R&D expenditures by total assets.

For our cost of capital variable, we use the annualized excess return on the firm's stock. This is computed from first, annualizing the daily returns and risk-free rate separately, and then subtracting the annualized risk-free rate from the annualized stock return. For specifications in which the cost of capital is the dependent variable, we include the following asset-pricing control variables. The book-to-market is common equity liquidation value divided by total market value. Liquidity is measured as the percentage of trading days in a year in which the stock return is not equals to zero. Also, we run the Fama-French three-factor model from daily data to obtain annual coefficient estimates on the three factors; market risk premium, small minus big, and high minus low.

For tests examining firm risk, we measure total firm risk as the annualized volatility of daily excess stock returns obtained from The Center for Research in Security Prices (CRSP). We further dissect total risk into the systematic and unsystematic components. We first run an OLS regression with the Fama-French three-factor model on the firms' daily excess returns and use the annualized standard deviation of the residuals as our measure for unsystematic risk. Then, we subtract the annualized variance of residuals from the annualized variance of daily excess returns and take the square root to compute the systematic risk.

Our firm-specific control variables are constructed using accounting and financial data from Compustat. We use Tobin's Q, profitability, and firm size, cash flow scaled by beginning-of-period total assets, cash holdings, inventory, property, plant and equipment (all scaled by contemporaneous total assets), and leverage measured as total debt over total capital. For tests examining the differential impact during the

2008 financial crisis, we define a *Crisis* indicator variable, which takes the value of 1 if the observation year is 2008 or 2009, and 0 otherwise.

3.3.4 Descriptive Statistics

We present descriptive statistics for the dependent and main independent variables in Table 3.4 . All variables except indices are Winsorized at the 1^{st} and 99^{th} percentiles. In our sample, the average firm-year discloses approximately two types of funding sources. All firm-years report at least one funding source, and no firm-years has more than five funding sources. The average firm-year shows slightly more than one source of internal funds and about one source of external funds. Preliminarily, this suggests that corporate managers on average structure financial policy to rely evenly on both internal and external sources of funds. It is also noteworthy that the internal and external fund source indices have very different distributions. The internal fund source index is almost evenly-distributed about its mean while the external fund source index is positively-skewed. This implies that firms appear less likely to rely excessively on external sources of funding.

3.4 Empirical Results

The vast majority of the disclosure statements project expected funding sources for the next twelve months. Therefore, funding disclosures made in year $t-1$ are related to the outcomes of the dependent variables in year t. As such, we contend that lagging our fund source indices by one year is adequate to test their informative value. Also note that in our empirical specifications, we include firm and year fixed effects (except in specifications with the *Crisis* dummy) to account for unobservable

Table 3.4: Descriptive Statistics

This table presents descriptive statistics on 24,523 firm-year observations. Mean, Median, SD, Min., and Max. report the means, medians, standard deviations, minimum, and maximum of the variables, respectively. In Panel A, Composite Fund Source Index takes the sum of the indicator variables for the eight types of funding sources (cash on hand, cash flow from operations, bank debt, other debt, equity, other issuances, asset sale, and unspecified) and divided by 8. The Internal Fund Source Index takes the sum of the indicator variables of cash on hand and cash flow from operations and divided by 2. The External Fund Source Index takes the sum of the indicator variables of bank debt, other debt, equity, and other issuances and divided by 4. Panels B and C, show the statistics for the dependent and control variables used in our empirical tests, respectively. Detailed definitions of these variables are in the Appendix.

	Mean	Median	SD	Min.	Max.
Panel A: Fund Source Indices					
Comp. Fund Index	0·255	0·250	0·110	0·125	0·625
Int. Fund Index	0·604	0·500	0·329	0·000	1·000
Ext. Fund Index	0·119	0·000	0·130	0·000	0·500
Panel B: Dependent Variables					
External Finance	0·071	0·004	0·218	−0·274	1·012
SEO	0·023	0·000	0·103	0·000	0·695
Debt Finance	0·007	0·000	0·088	−0·261	0·388
Capex	0·059	0·036	0·069	0·000	0·403
R&D	0·075	0·015	0·125	0·000	0·699
Div. & Repurchases	0·031	0·002	0·062	0·000	0·356
Cost of Capital	0·006	0·033	0·588	−1·958	1·503
Total Risk	0·576	0·520	0·324	0·000	1·715
Systematic Risk	0·202	0·171	0·150	0·000	1·876
Unsystematic Risk	0·513	0·457	0·309	0·000	1·573
Panel C: Control Variables					
Cash Flow	0·042	0·084	0·207	−0·935	0·434
Q	2·276	1·621	1·938	0·587	12·241
Log Assets	5·716	5·601	1·731	2·140	10·192
Log Market Cap.	5·969	5·961	1·824	1·867	10·638
Cash	0·279	0·168	0·319	0·001	1·739
PP&E	0·224	0·153	0·211	0·005	0·888
Leverage	0·259	0·167	0·303	0·000	1·567
Inventory	0·270	0·244	0·189	0·000	0·785
Log Book-to-Market	−0·859	−0·784	0·890	−8·631	1·112
Liquidity	0·934	0·968	0·078	0·634	1·000
MKT Beta	2·494	2·463	1·458	−0·940	6·713
SMB Beta	2·111	1·965	1·957	−2·269	7·911
HML Beta	0·169	0·211	2·363	−7·257	6·880

effects that can bias our coefficients and statistical inferences. Additionally, we cluster standard errors by firm to correct for hetereogeneity and autocorrelation in standard errors.

3.4.1 Do Funding Disclosures Predict Financing Policy?

We first investigate whether managers are truthful about their intended financing policy. If the funding disclosures contain accurate information, then we expect to find firms that intend to rely on external funds to actually raise external capital in the next period. We test this by regressing measures of external financing raised on the fund sources indices. Table 3.5 presents the results.

In columns (1), (3), and (5), we show that only the external fund source index predicts external capital raised. We further decompose the external capital into equity and debt. We define equity capital as proceeds from SEOs. This is a better measure for the actual amount of equity capital raised because we can exclude employee stock options, warrants, and unit trusts, which are often co-mingled in the conventional computation of net equity issuance (sale of common/preferred stock less purchase of common/preferred stock) from Compustat data. The external fund source index consistently shows that the more external sources the firm plans to rely on, the greater the amount of equity and debt issuances. On the other hand, the internal fund source index has no significant correlation to external capital raised. The evidence here proves that when managers make ex-ante decisions on future financing policy, firms on average follow through with the plans, and the disclosures are made not merely to satisfy regulatory requirements, but serve to provide credible information to outsiders.

Table 3.5: Predicting Financing Policy with Qualitative Funding Disclosures

The table reports estimation results from OLS panel regressions with fixed-effects examining the relationship between qualitative funding disclosures and capital-raising activities. In columns 1 and 2, the dependent variable is External Finance, which is the sum of net equity and long term debt issuances. In columns 3 and 4, the dependent variable is SEO, which is the proceeds from seasoned equity offerings scaled by total assets. In columns 5 and 6, the dependent variable is Debt Finance, which is the net long term debt issuances. *IF* is Internal Fund Source; *EF* is External Fund Source; and *USP* is Unspecified Fund Source. The fund source indices and indicator variables are all lagged by one year. Cash Flow, Q, and Log Assets are measured contemporaneously, while Inventory, PP&E, and Leverage are lagged by one year. Definitions of these variables are detailed in the Appendix. All specifications include firm and year fixed-effects. Standard errors are clustered by firm. t-statistics are reported in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	External Finance		SEO		Debt Finance	
	(1)	(2)	(3)	(4)	(5)	(6)
IF Index	−0·00578		−0·00321		−0·00161	
	(−0·802)		(−0·808)		(−0·370)	
EF Index	0·0445***		0·0275***		0·0169*	
	(2·876)		(2·616)		(1·693)	
IF Indicator		−0·00861		0·00123		0·00134
		(−0·926)		(0·241)		(0·233)
EF Indicator		0·0117***		0·00767***		0·00498*
		(2·696)		(2·615)		(1·828)
USP Indicator		−0·00418		0·00599		0·00412
		(−0·321)		(0·810)		(0·571)
Cash Flow	−0·272***	−0·272***	−0·0502***	−0·0503***	−0·0226***	−0·0227***
	(−13·81)	(−13·82)	(−4·578)	(−4·585)	(−2·785)	(−2·792)
Q	0·0178***	0·0178***	0·00853***	0·00853***	−0·00103	−0·00103
	(10·75)	(10·73)	(7·208)	(7·190)	(−1·478)	(−1·476)
Log Assets	0·0486***	0·0485***	0·0118***	0·0117***	0·0281***	0·0281***
	(12·85)	(12·83)	(5·251)	(5·241)	(12·57)	(12·55)
Inventory	0·313***	0·313***	0·0731***	0·0731***	0·0986***	0·0985***
	(13·49)	(13·48)	(5·448)	(5·440)	(8·201)	(8·198)
PP&E	0·197***	0·197***	0·00469	0·00444	0·0742***	0·0740***
	(7·760)	(7·733)	(0·308)	(0·291)	(4·712)	(4·695)
Leverage	−0·0692***	−0·0690***	0·0242***	0·0243***	−0·133***	−0·133***
	(−6·190)	(−6·177)	(4·022)	(4·034)	(−15·61)	(−15·62)
No. of Obs.	17,700	17,700	17,700	17,700	17,700	17,700
No. of Firms	3,494	3,494	3,494	3,494	3,494	3,494
Adj. R^2	0.142	0.142	0.032	0.032	0.115	0.115

As a robustness check on our fund source measures, instead of using indices based on the count of the number of funding sources, we simply use indicator variables to denote the availability of internal and external funds. The internal fund source indicator takes a value of 1 if a firm-year shows availability of any single type of internal funding source, and 0 if no internal funds are shown. The external fund source indicator is constructed similarly with availability of external funding sources. Additionally, we also include an unspecified only indicator, which takes a value of 1 for firm-years disclosing *only* unspecified funding sources. This is an indicator for disclosures with very little information content.

The results in columns (2), (4), and (6) support our conclusion that the external funding disclosures are informative about the firms' financing policies because they show a positive and significant association with the actual amount of capital raised in the next period. This is the first key piece of evidence that qualitative funding disclosures transmit credible information.

3.4.2 Implications of Funding Disclosures on Investment Activity

In this section, we investigate the implication of funding disclosures on future capital expenditures. Other than to meet working capital needs and debt servicing obligations, corporate managers also need to plan how to fund investment projects. The variation in capital expenditures across firms is usually explained by cash flows and investment opportunities. This is based on the q-theory of investment, which states that firms maximize investments with capital stock (both endowed and acquired over a given period) so long as "marginal q" remains positive. In empirics, the capital

stock is cash flow, and the average Tobin's q proxies for investment opportunities.

However, this conventional investment equation omits an important intangible variable; corporate managers' *expectations* of raising capital beyond internally-generated funds to finance projects. Managers often plan the firms' investment activity in advance, and the level of activity should also be contingent on projections of the ability to acquire external sources of funds if internal sources are insufficient. We argue that since managers' expectations of funding are revealed in the funding disclosures, our fund source indices are pertinent to predicting how much firms invest in the next period.

We test this conjecture by regressing capital expenditures scaled by beginning-of-period total assets on our fund source indices in addition to cash flow (also scaled by beginning-of-period total assets) and lagged Tobin's q. We also include firm-specific controls of cash holdings, size, leverage, and property, plant and equipment. The controls, other than size which is the natural log of total assets, are all scaled by contemporaneous total assets, and lagged. Table 3.6 presents the results.

First, we use our composite fund source index as a regressor. And, the positive and significant coefficients on this index as shown in column (1) suggest that firms which expect to have access to more sources of funding, both internal and external, will invest more. This result is a reflection of managers' optimism on the firms' ability to have sufficient funding sources, and with it a confidence to carry out planned capital expenditures.

Next, we dissect our composite fund source index into the internal and external fund source indices to explore which type of funding source the average firm plans to rely on to finance investments. The results in column (2) clearly shows that the

higher the external fund source index, the higher the investment activity in the following period. On the other hand, the internal fund source index does not drive future investment activity. This evidence suggests that when managers formulate financial policy, a key determinant of how much the firm will invest depends on the number of external funding sources managers are confident of securing. Now, while it is true that *contemporaneous* cash flow is positively and significantly correlated to investments, a distinction must be drawn with the internal fund source index. The lack of statistical significance on this index is evidence that firms do not *ex-ante plan* to finance capital expenditures with internally-generated funding sources. This however, does not restrict firms from channeling cash flows generated *in the same period* to fund capital expenditures.

As a robustness check, we use R&D expenditures as our measure of investment activity. These expenditures are also scaled by the beginning-of-period total assets. We find that the composite and external fund source indices continue to be positively-associated with the level of R&D expenditures. All the results remain unchanged when we use our fund source indicators instead of the indices. We further investigate whether funding disclosures could be related to non-investment activity such as paying dividends and stock repurchases, but we do not find any significant relationship.

The results in this section collectively show that firms plan to utilize external funding sources more so than internal sources to finance investment projects. This information is conveyed to outsiders through disclosures of external funding sources. Together with the results from the preceding section, we conclude qualitative funding disclosures provide credible information and have predictive implications on the firm's capital-raising and investment activity.

Table 3.6: Qualitative Funding Disclosures as Determinants of Investment Activity

The table reports estimation results from OLS panel regressions with fixed-effects examining the relationship between qualitative funding disclosures and investment activities. In columns 1, 2 and 3, the dependent variable is Capex, which is capital expenditures scaled by total assets. In columns 4, 5, and 6, the dependent variable is R&D, which is research and development expenditures scaled by total assets. In columns 7, 8, and 9, the dependent variable is Div. & Repurchases, which is the sum of cash dividends and stock repurchases scaled by total assets. *CF* is Composite Fund Source; *IF* is Internal Fund Source; *EF* is External Fund Source; and *USP* is Unspecified Fund Source. The fund source indicies and indicator variables are all lagged by one year. Cash Flow is measured contemporaneously while Q, Cash, Log Assets, Leverage, and PP&E are all lagged by one year. Definitions of these variables are detailed in the Appendix. All specifications include firm and year fixed-effects. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	Capex			R&D			Div. & Repurchases		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CF Index	0·0326***			0·0222**			−0·00856		
	(3.824)			(2·163)			(−0·862)		
IF Index		0·00527*			0·00165			−0·00292	
		(1·661)			(0·413)			(−0·717)	
EF Index		0·0161**			0·0151**			−0·0112	
		(2·299)			(1·988)			(−1·452)	
IF			−0·00129			−0·000318			−0·00124
Indicator			(−0·302)			(−0·0947)			(−0·235)
EF			0·00481**			0·00494**			−0·00287
Indicator			(2·487)			(2·284)			(−1·338)
USP			−0·00222			0·00425			0·00282
Indicator			(−0·425)			(0·662)			(0·459)
Cash Flow	0·0230***	0·0231***	0·0232***	−0·115***	−0·115***	−0·115***	0·0184***	0·0184***	0·0183***
	(4·468)	(4·477)	(4·496)	(−9·897)	(−9·890)	(−9·900)	(3·253)	(3·249)	(3·240)
Q	0·00619***	0·00621***	0·00622***	0·0102***	0·0102***	0·0102***	0·00238***	0·00240***	0·00242***
	(11·33)	(11·33)	(11·34)	(9·122)	(9·130)	(9·126)	(3·231)	(3·265)	(3·287)

(continued)

Table 3.6—*Continued*

	Capex			R&D			Div. & Repurchases		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cash	0·00361	0·00353	0·00352	−0·0270***	−0·0270***	−0·0270***	0·000994	0·000974	0·000993
	(1·382)	(1·347)	(1·343)	(−5·271)	(−5·266)	(−5·257)	(0·284)	(0·278)	(0·283)
Log Assets	−0·0127***	−0·0127***	−0·0125***	−0·0391***	−0·0390***	−0·0389***	0·00617***	0·00622***	0·00618***
	(−8·410)	(−8·314)	(−8·208)	(−11·46)	(−11·44)	(−11·47)	(3·515)	(3·540)	(3·511)
Leverage	−0·0280***	−0·0280***	−0·0281***	−0·00886	−0·00890	−0·00890	−0·0344***	−0·0345***	−0·0344***
	(−8·197)	(−8·175)	(−8·201)	(−1·425)	(−1·435)	(−1·431)	(−7·535)	(−7·528)	(−7·521)
PP&E	0·0431***	0·0433***	0·0429***	0·0615***	0·0614***	0·0610***	−0·0296**	−0·0292**	−0·0290**
	(2·676)	(2·694)	(2·670)	(4·016)	(4·002)	(3·983)	(−2·321)	(−2·285)	(−2·270)
No. of Obs.	13,259	13,259	13,259	13,259	13,259	13,259	13,259	13,259	13,259
No. of Firms	2,761	2,761	2,761	2,761	2,761	2,761	2,761	2,761	2,761
Adj. R^2	0.149	0.148	0.148	0.260	0.260	0.260	0.060	0.060	0.060

3.4.3 How Do Funding Disclosures Affect the Cost of Capital

Having established that disclosure policies on financing plans provide the market with credible information, which reduces information asymmetry, we proceed to analyze how the differential in information structure affects the cost of capital. We conjecture that a rational expectations equilibrium exists such that investors will demand higher expected returns on capital provided to firms with greater informational asymmetry problems.

A key advantage of our fund source indices is they measure the type and amount of information disclosed to the public, and can therefore function as direct proxies for the severity of information asymmetry. We use the annualized excess return on the firm's stock as a measure for the cost of capital and regress it on our fund source indices according to the technique in Fama and Macbeth (1973) to investigate the relationship between information asymmetry and cost of capital. Table 3.7 presents the results.

The composite fund source index shows a significantly negative coefficient indicating that the lesser the information asymmetry, the lower the cost of capital. This is consistent with theory predicting that reducing information asymmetry mitigates firm risk, which leads to decreased cost of capital. When we further investigate the type of financing information that contributes more to easing information asymmetry, we find that more disclosures of external funding sources consistently leads to significant reductions in cost of capital. According to the external fund source index, disclosing one additional source of external fund decreases the cost of capital by 3.8%. And, based on the external fund source indicator, firms disclosing any type of external

fund can expect to have a 4.4% discount to the their cost of capital. The results show that qualitative disclosures do not uniformly reduce information asymmetry. Some types of disclosures are perceived by the market to contain more pertinent information, and have greater effect on the cost of capital. A crucial implication is managers can influence their firm's cost of capital through careful structuring of information disclosure policies.

Table 3.7: How the Level of Information Asymmetry Affects the Cost of Capital

The table reports estimation results from Fama and MacBeth regressions examining how the level of information asymmetry measured by the amount and type of qualitative disclosures influence the cost of capital. The dependent variable is Cost of Capital, which is measured as the annualized daily excess stock return. *CF* is Composite Fund Source; *IF* is Internal Fund Source; *EF* is External Fund Source; and *USP* is Unspecified Fund Source. The fund souce indices and indicator variables are all lagged by one year. NDRE is an indicator variable that takes a value of 1 if External Fund Source Index for a firm-year observation in year t-1 is zero, but External Finance is positive in year t, and 0 otherwise. NDRS is an indicator variable that takes a value of 1 if fund source indicators EQ (equity) and OI (other issuance) are both zero in year t-1, but SEO is positive in year t, and 0 otherwise. NDRD is an indicator variable that takes a value of 1 if fund source indicators OD (other debt), BD (bank debt), and OI sum to zero in year t-1, but Debt Finance is positive in year t. All other variables are defined in the Appendix. t-statistics are reported in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	Cost of Capital					
	(1)	(2)	(3)	(4)	(5)	(6)
CF Index	−0·162***					
	(−4·354)					
IF Index		−0·00896				
		(−0·647)				
EF Index		−0·150***				
		(−3·609)				
IF			−0·0326*			
Indicator			(−1·896)			
EF			−0·0435***			
Indicator			(−3·710)			
USP			0·0194			
Indicator			(0·648)			
NDRE				0·0200*		
				(1·971)		
NDRS					0·0656*	
					(2·113)	
NDRD						0·0227**
						(2·224)

(continued)

Table 3.7—*Continued*

	Cost of Capital					
	(1)	(2)	(3)	(4)	(5)	(6)
Log Market Cap.	0·0399**	0·0400**	0·0398**	0·0441***	0·0442***	0·0447***
	(2·853)	(2·857)	(2·879)	(3·311)	(3·344)	(3·338)
Log Book-to-Market	−0·160***	−0·161***	−0·162***	−0·154***	−0·153***	−0·154***
	(−8·666)	(−8·705)	(−8·646)	(−8·159)	(−7·919)	(−8·052)
Liquidity	−0·0572	−0·0768	−0·0791	−0·00110	−0·00279	0·000776
	(−0·211)	(−0·294)	(−0·308)	(−0·00457)	(−0·0114)	(0·00321)
MKT Beta	−0·0372*	−0·0369*	−0·0363	−0·0387*	−0·0403*	−0·0390*
	(−1·789)	(−1·768)	(−1·749)	(−1·917)	(−1·975)	(−1·934)
SMB Beta	−0·00222	−0·00230	−0·00235	−0·00197	−0·00254	−0·00221
	(−0·245)	(−0·254)	(−0·259)	(−0·239)	(−0·307)	(−0·269)
HML Beta	0·0207	0·0202	0·0200	0·0212*	0·0223*	0·0217*
	(1·748)	(1·722)	(1·707)	(1·876)	(1·940)	(1·914)
No. of Obs.	15,101	15,101	15,101	18,974	18,974	18,974
R^2	0.197	0.199	0.200	0.190	0.189	0.189

Next, we show that there is a strong incentive for firm managers to honestly disclose the firm's funding sources. Since disclosures of external funding sources naturally relates most to the firm's future capital-raising activity, we investigate how the cost of capital is affected for firms that do not ex-ante disclose their intention to raise external capital, but actually do so in the following year. We use three indicator variables to conduct this test. First, *NDRE* or "no disclosures, but raised external capital" takes a value of 1 if the external fund source index in year $t-1$ is zero, but the external finance variable is positive in year t, and 0 otherwise. The second indicator, *NDRS* or "no disclosures, but raised SEO" takes a value of 1 if the EQ and OI indicators are both zero in year $t-1$, but the proceeds from SEOs are positive in year t. Finally, *NDRD* or "no disclosures, but raised debt capital" takes a value of 1 if the sum of the indicators OD, BD, and OI equals zero, but the net long term debt issuance is positive in year t.

Columns (4), (5), and (6) of Table 3.7 show the coefficient estimates on the

indicator variables. All the coefficients are positive and significant, suggesting that firms that did not inform the market of their intention to raise external capital beforehand experience an increase in their subsequent cost of capital. The greatest increase is seen for firms that make no disclosures on their intention to raise equity capital, but subsequently proceed to conduct SEOs. Their cost of capital can increase by 6.6% in expectation, which is an economically-significant levy on the firm's financing cost. The evidence is clear that if managers deliberately withhold information on their financing plans, or even if they are honest, but deviate from the original plans, the market considers such firms to have greater information asymmetry problems, and compensates the higher informational risk with higher cost of capital.

Our results thus far, support our hypotheses that qualitative funding disclosures are credible because they are significantly associated with the firm's capital-raising activities. Moreover, the disclosures are business-relevant because they preemptively inform outsiders on the firm's capital expenditures intent. The disclosures also serve to reduce information asymmetry, particularly disclosures of external funding sources, and lower the firm's cost of capital.

3.4.4 How Are Firm Risks Affected By Disclosures of Funding Sources?

A key source of information potential lenders and equity holders rely on to infer the future riskiness of a firm is the firm's disclosure of funding sources. This is especially important in a financial crisis during which external financing is constrained and firm risk becomes elevated from increased external funding uncertainty. It follows that firms that rely more on internally-generated funds should be able to mitigate

their risk during a crisis while firms that rely more on external funds face greater risk. To test this prediction, we regress firm risk on the internal fund source index and external fund source index interacted with the *Crisis* dummy. Table 3.8 presents the results.

As expected, firm risk measured by total, systematic, and unsystematic risks increase during the 2008–2009 financial crisis since this period saw severe market volatility especially when Lehman Brothers announced bankruptcy in September 2008 and the near-collapse of AIG later on. However, firms relying only on internal funds during the crisis can expect to reduce their total firm risk by an average of 3.4% as shown by the coefficient on the interaction term, $Crisis$ x $IF\ Index$, in column (2) while firms relying only on external funds during the crisis experience an average increase of 17.7% in total risk. It is also noteworthy that firms which have intended to rely on a mix of internal and external funds can expect to attenuate their total risk by weighting more on internal sources of funding. This evidence is consistent with the heightened difficulty of securing external capital during the crisis, which puts firms that require external funds at greater risk of not being able to meet obligations and objectives. When we dissect total risk into its systematic and unsystematic components, we find that a greater reliance on external funds increases both components of total risk, and reliance on internal funds reduces idiosyncratic risk.

Additionally, the results show that firms with more growth opportunities are riskier, which is consistent with the greater uncertainty faced by high growth firms since they tend to invest in more projects relative to low growth firms. Not surprisingly, the coefficient on firm performance measured as return on assets is negative

Table 3.8: What do the Qualitative Funding Disclosures Indicate About Firm Risks

The table reports estimation results from OLS panel regressions with fixed-effects examining the relationship between qualitative funding disclosures and measures of firm risk. In columns 1 and 2, the dependent variable is Total Risk, which is the annualized volatility of daily excess stock returns. In columns 3 and 4, the dependent variable is Systematic Risk, which is $\sqrt{(Total\ Risk)^2 - (Unsystematic\ Risk)^2}$. In columns 5 and 6, the dependent variable is Unsystematic Risk, which is the annualized standard deviation of the residuals from OLS regressions of the daily excess stock returns using the Fama and French three-factor model. *IF* is Internal Fund Source; *EF* is External Fund Source; and *USP* is Unspecified Fund Source. The fund source indices and indicator variables are all lagged by one year. Crisis is an indicator variable that takes a value of 1 if the firm-year observation is in year 2008 or 2009, and 0 otherwise. Definitions of other variables are detailed in the Appendix. All specifications include firm fixed-effects only. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	Total Risk		Systematic Risk		Unsystematic Risk	
	(1)	(2)	(3)	(4)	(5)	(6)
IF Index	−0·0463***		−0·00599		−0·0515***	
	(−2·964)		(−0·936)		(−3·633)	
EF Index	0·0886**		0·0277*		0·0754**	
	(2·481)		(1·862)		(2·315)	
Crisis ×	−0·0336		−0·00457		−0·0159	
IF Index	(−1·632)		(−0·381)		(−0·869)	
Crisis ×	0·177***		0·0984***		0·143***	
EF Index	(3·358)		(3·410)		(3·028)	
Crisis	0·224***	0·206***	0·152***	0·130***	0·161***	0·160***
	(13·65)	(5·473)	(16·47)	(5·082)	(11·04)	(4·844)
IF		−0·00499		−0·0136*		−0·0117
Indicator		(−0·251)		(−1·707)		(−0·606)
EF		0·0232**		0·00599		0·0188**
Indicator		(2·407)		(1·481)		(2·150)
USP		0·0373		−0·0100		0·0341
Indicator		(1·329)		(−0·903)		(1·309)
Crisis ×		−0·0121		0·0135		−0·0124
IF Indicator		(−0·333)		(0·537)		(−0·389)
Crisis ×		0·0521***		0·0314***		0·0391***
EF Indicator		(3·651)		(4·044)		(3·024)
Crisis ×		0·0511		0·0515*		0·0135
USP Indicator		(1·125)		(1·780)		(0·341)
Q	0·0252***	0·0253***	0·0210***	0·0210***	0·0118***	0·0119***
	(10·49)	(10·53)	(19·78)	(19·79)	(5·633)	(5·678)
ROA	−0·201***	−0·201***	−0·0468***	−0·0465***	−0·205***	−0·206***
	(−8·713)	(−8·778)	(−5·436)	(−5·396)	(−10·02)	(−10·10)
Log Assets	−0·0666***	−0·0680***	0·0240***	0·0238***	−0·0736***	−0·0752***
	(−11·33)	(−11·64)	(8·972)	(8·998)	(−13·91)	(−14·30)
No. of Obs.	17,908	17,908	17,908	17,908	17,908	17,908
No. of Firms	3,524	3,524	3,524	3,524	3,524	3,524
Adj. R^2	0.148	0.147	0.264	0.265	0.139	0.138

and significant because more profitable firms should be less risky. As for firm size, larger firms have less total risk since these firms tend to have less difficulty in securing external capital for their needs and have greater stability in performance. Undoubtedly, larger firms have higher systematic risk as their stock returns are more correlated to market performance.

3.5 Conclusion

We develop a key improvement to extant textual analysis methodologies by explicitly considering the grammatical relationships among words such that the context of sentences are accounted for. This ensures accurate identification of information from qualitative disclosures. To our knowledge, we are the first to apply the Stanford CoreNLP computation linguistics technique to study the credibility and implications of disclosures of funding sources found in annual reports as required by SEC Regulation S-K.

Our results show that qualitative fund source disclosures contain pertinent information that transmit signals to outside investors regarding future firm behavior and characteristics. We further show that these disclosures can alleviate the information asymmetry problem and are significantly associated with the firm's cost of capital. Our study underscores the incontrovertible importance of the information contained in qualitative disclosures, which cannot be ignored if one's objective is to perform holistically complete analyses of firms. Finally, we set a new benchmark of utilizing grammatical NLP techniques to perform textual analyses.

3.6 Appendix: Variable Descriptions

Fund Source Indices

Composite fund source index takes the sum of the indicator variables for the eight types of funding sources (cash on hand, cash flow from operations, bank debt, other debt, equity, other issuances, asset sale, and unspecified) and divided by 8.

External fund source index takes the sum of the indicator variables for four types of external funding sources (bank debt, other debt, equity, and other issuances) and divided by 4.

Internal fund source index takes the sum of the indicator variables for two types of internal funding sources (cash on hand and cash flow from operations) and divided by 2.

Dependent Variables

External financing is the sum of net equity issuance (Compustat items: *sstk* – *prstkc*) and net long term debt issuance (Compustat items: *dltis* – *dltr*) scaled by contemporaneous total assets (Compustat item: *at*).

Equity financing is the net equity issuance (Compustat items: *sstk* – *prstkc*) scaled by contemporaneous total assets (Compustat item: *at*).

Debt financing is the net long term debt issuance (Compustat items: *dltis* – *dltr*) scaled by contemporaneous total assets (Compustat item: *at*).

Total risk is the annualized volatility of daily excess stock returns. The daily excess stock return is the difference of daily stock return (CRSP item: *ret*) and the daily risk-free rate (*rf*) obtained from the Kenneth R. French Data Library available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. Volatility is the standard deviation of the daily excess stock returns. Annualized volatility is volatility multiplied by the square root of 252.

Unsystematic risk is the standard deviation of the residuals from regressing the daily excess stock returns on the Fama-French three factors (*mktrf*, *smb*, and *hml*) obtained from the Kenneth R. French Data Library.

Systematic risk is the square root of the difference of the square of ***Total risk*** and the square of ***Unsystematic risk***.

Investment is capital expenditures (Compustat item: *capx*) scaled by the beginning-of-period total assets (Compustat item: *at*).

Covenant index is the sum of the indicator variables for fifteen categories of covenant restrictions following Billett, King, and Mauer (2007). The data is obtained from the Fixed Investment Securities Database (FISD).

Financing restrictions is the sum of the indicator variables for seven categories of covenant restrictions relevant to financing activities following Billett et al. (2007). The data is obtained from FISD.

Control Variables

Cash flow is the sum of income before extraordinary items (Compustat item: *ib*) and depreciation and amortization (Compustat item: *dp*) scaled by beginning-of-period total assets (Compustat item: *at*).

Q is the ratio of the market value of assets (Compustat items: *at – ceq – txdb + csho x prcc_f*) to the book value of assets (Compustat item: *at*).

Firm size is measured as the natural logarithm of the total assets (Compustat item: *at*).

Cash is the cash and short-term investments (Compustat item: *che*) scaled by contemporaneous total assets (Compustat item: *at*).

Inventory is the sum of total receivables (Compustat item: *rect*) and change in inventory (Compustat item: *invch*) scaled by contemporaneous total assets (Compustat item: *at*).

PPE is the net total property, plant, and equipment (Compustat item: *ppent*) scaled by

contemporaneous total assets (Compustat item: *at*).

Leverage is the ratio of total debt (Compustat items: *dltt* + *dlc*) to total capital (Compustat items: *dltt* + *dlc* + *seq*).

ROA is the return on assets measured as income before extraordinary items (Compustat item: *ib*) over contemporaneous total assets (Compustat item: *at*).

Institutional ownership is the percentage of shares outstanding owned by institutions (*instown_perc*) obtained from the Thomson Reuters Institutional (13f) Holdings database.

CHAPTER 4

NON-ELECTORAL POLITICAL UNCERTAINTY AND THE PRECAUTIONARY MOTIVE FOR HOLDING CASH: EVIDENCE FROM EAST ASIA

4.1 Introduction

In imperfect capital markets, holding liquid assets is necessary for two reasons. First, it can be costly for firms to convert cash substitutes into cash or to raise external financing should there be unexpected shortfalls in cash flow. Second, information asymmetries in markets can deter firms from raising external financing at the moment when cash is required because securities will have to be issued at a discount. Keynes (1936) describe the above two reasons as the transaction cost motive and the precautionary motive for holding cash, respectively. Both explanations advocate that liquidity management is in itself an important aspect of corporate financial policy, and is neither an auxiliary nor mechanical outcome of other corporate decisions such as investments. While a large number of theoretical and empirical studies have expounded the determinants of cash holdings (see for example, Bates, Kahle, & Stulz, 2009; Baumol, 1952; Denis & Sibilkov, 2010; Dittmar & Mahrt-Smith, 2007; Miller & Orr, 1966; Opler et al., 1999; Whalen, 1966), we have limited knowledge of how cash management decisions are made in a world where market imperfections are exacerbated by political uncertainty.

Research in political economics show that politics exerts significant influence over the business environment. On one hand, political influence can effect positive outcomes. For example, firms with strong political connections have easier access to debt capital (Faccio, 2006), are more likely to receive government bailouts during crisis (Faccio et al., 2006), and are better able to secure preferential subsidies (Johnson & Mitton, 2003), etc. But, politics can also lead to negative consequences. Several studies show that uncertainty in the political climate deters dividend payment (Huang, Wu, Yu, & Zhang, 2015), and leads firms to cut capital expenditures (Julio & Yook,

2012; Pindyck & Solimano, 1993; Rodrik, 1991). Evidently, political uncertainty can have profound impacts on corporate finance decisions.

The connection between political uncertainty and corporate cash holdings is best explained by the precautionary motive for holding cash. Since political uncertainty channels through to the aggregate economy by increasing unpredictability in policies and outcomes, it follows that uncertainty distorts the expected distribution of net cash disbursements of firms such that it increases the risk of illiquidity when raising external financing is costly. Consequently, firm managers should respond to adverse shocks from political uncertainty by increasing cash contingencies, which is consistent with the precautionary motive view of holding cash. An important theory supporting this hypothesis stems from the model in Stanhouse (1982), which shows a positive relationship between the amount of information demanded by decision makers and the optimal level of precautionary cash firms should hold. If one argues that political uncertainty intensifies information asymmetry problems in the markets, then firm managers should demand more information to make sound decisions, and the equilibrium outcome is an increase in cash balance. The precautionary motive for holding cash is also supported by Myers and Majluf (1984) who show that firms can avoid difficulties in raising external funds due to asymmetric information by building-up liquid assets.

In this paper, I hand-collect a unique cross-country dataset of non-electoral incidents in East Asia that cause political uncertainty and investigate corporate cash holdings policy during the occurrence of these incidents. Based on the assumption made by Alesina and Perotti (1996) that "policy changes relevant for economic decisions can occur only when governments change", the non-electoral incidents

must consist of threats to the stability of incumbent governments such that they cause uncertainty over the governments' continuity. Thus, I define non-electoral political incidents as large-scale demonstrations against the government, coups *d'état*, assassinations of the head of government, political scandals involving the head of government, and states of emergency of a political nature. The choice of utilizing non-electoral incidents instead of national elections as a proxy for political uncertainty offers several advantages. First, non-electoral incidents occur mostly randomly with very little forewarning. Thus, political uncertainty from these incidents acts as strong exogenous shocks to firm economics. This is unlike the majority of elections around the world, which occur in predictable cycles mandated by the constitutions of countries. As such, firms are able to preemptively formulate corporate policies in anticipation of changes in economic policies based on electoral outcomes, implying that the ability to report the causal effects of political uncertainty from elections on firm behavior is severely diminished. Second, the outcomes of non-electoral incidents are more difficult to predict than outcomes of elections. For instance, it is much harder to foresee whether an attempted military coup would successfully topple the incumbent government than to forecast which party would win the elections and form the government. In fact, there are several democracies with a dominant ruling party and very little political-party fragmentation such that it is highly improbable for elections to result in a change of government. Therefore, non-electoral incidents provide a better identification of political uncertainty than elections.

East Asia is an interesting and appropriate setting for the purpose of this study because democratic countries in this region frequently experience political instability of a non-electoral nature. This provides a rich dataset of exogenous political shocks

to conduct a natural experiment investigating the effects of political uncertainty on cash management decisions. Consequently, stronger causal inferences can be made from the results of the analysis in this study, unlike studies that only use elections as a proxy for political uncertainty. Moreover, there are conspicuous structural differences in political governance and legal frameworks across countries in East Asia, which allows me to exploit the variations in country political characteristics and examine the differential effects of political uncertainty on cash holdings.

I document robust evidence that political uncertainty from non-electoral incidents causes firms to increase cash balances. After controlling for firm and industry-specific characteristics, cash balances increase by an average of 5.2% in years when non-electoral incidents occur, which is larger than the magnitude of cash holdings increase during national elections reported in Julio and Yook (2012). Additionally, the results show that there is no statistically significant change to cash holdings around national elections. The baseline evidence provides two key implications. First, the determinants of corporate cash holdings go beyond firm characteristics; political uncertainty is another significant factor that impacts cash management decisions. Second, national elections do not appear to be a good identification of political uncertainty. The predictability of election cycles and the endogenous relationship between the call for elections and economic performance[1] dampens the degree of uncertainty created by elections. While Julio and Yook (2012) do show that cash holdings increase during elections, the results in this paper prove that when non-electoral incidents causing political uncertainty are also considered, national elections lack power as a proxy for uncertainty in determining cash holdings.

[1]Julio and Yook (2012) document that approximately 55% of elections held between 1980 and 2005 in 48 countries were called opportunistically during periods of high economic growth.

To further illuminate the effects of non-electoral political uncertainty on cash holdings, I examine cash policy response after the first occurrence of a non-electoral incident. The intuition for this line of inquiry is based on the expectation that political uncertainty can lead to unstable or suboptimal economic policies that require time to stabilize or improve. This implies that uncertainty can persist, and firm managers need to continually structure cash policy responses accordingly until such time when the uncertainty is resolved. I find that managers continue to increase cash holdings in response to non-electoral political uncertainty up to two years after the incidents occur. The estimation results also show a step-down in cash holdings increases from 4.4% in the year incidents occur, to 2.2% one year after, and finally to 1.9% two years on. The results suggest that there are persistence effects in political uncertainty from non-electoral incidents, but the uncertainty subsides after two years on average. And, firm managers respond rationally by adjusting cash management policy according to the degree of uncertainty. Within countries, I also find variations in cash policy responses. Firms operating in industries considered sensitive to political changes increase cash holdings more so than other firms whenever there is political uncertainty.

In cross-country analysis, I find that differences in inherent political governance characteristics of countries can either attenuate or intensify the uncertainty caused by non-electoral incidents and lead to variations in cash policy responses. Using six measures for the quality and performance of governments obtained from the Worldwide Governance Indicators database, I find evidence suggesting that political uncertainty is mitigated in countries with better political and legal frameworks such as high government effectiveness and stronger adherence to govern by the rule of

law. And consequently, firms in such countries increase cash holdings less than that of firms in poor political governance countries in response to non-electoral political uncertainty. I also conduct tests to examine whether political uncertainty from a particular country spills over to its closest neighboring country and how firms respond. I find evidence that firm managers also consider political uncertainty from abroad to potentially lead to domestic uncertainty, and increase cash holdings when non-electoral incidents occur overseas. But, cash holdings increase less in response to overseas incidents than domestic incidents, which is consistent with the notion that foreign political uncertainty should cause less severe shocks to cash disbursements relative to domestic political uncertainty.

I also address a concern that the precautionary motive for holding cash as a result of political uncertainty may diminish in explanatory power when one also considers the alternative view that corporate governance may be a more significant determinant of cash holdings. This alternative view is termed the agency cost motive of holding cash, and originates from Jensen (1986) who argues that conflicting interests in principal-agent relationships can lead firm managers to hold more cash than optimal for maximizing shareholder wealth. After controlling for country-level corporate governance measured by the level of shareholder protection, I find that the precautionary motive continues to be a significant explanation for holding cash when there is political uncertainty caused by non-electoral incidents.

Two other tests show that the increase in average cash holdings caused by political uncertainty from non-electoral incidents is not a mechanical outcome of other corporate policy responses to uncertainty. First, I show that both debt and equity security issuances decline when non-electoral incidents occur. This proves

that the increase in cash holdings during periods of political uncertainty is not a consequence of an increase in external financing. Second, I find that the unconditional mean investment rates decline by 3.0% during years when non-electoral incidents occur relative to years without incidents occurring. In multivariate tests, investment rates drop by an average of 2.0% during incident years. Conversely, I do not find any statistically significant changes to investment rates during elections. Comparing the changes in cash holdings and investment rates during incident years, I find that the magnitude of investment rate decline is less than the 5.2% increase in cash holdings. Clearly, the findings suggests that one cannot systematically ascribe increases in cash holdings during periods of political uncertainty to purely a consequence of investment cuts. The additional 3.2% increase in cash levels lends strong support to the precautionary motive view that managers build up cash contingencies in response to political uncertainty.

The remainder of the chapter proceeds as follows. In Section 4.2, I develop the hypothesis and present a simple static trade-off model to establish a relationship between uncertainty and optimal corporate cash holdings. Section 4.3 presents a brief historical account of politics in East Asia from 1990 to 2014. Section 4.4 discusses the process of collecting data related to non-electoral incidents causing political uncertainty, and summarizes key statistics of the main variables. Section 4.5 presents empirical results from baseline tests of cash policy responses when non-electoral incidents occur, cross-country analyses, comprehensive robustness checks, and tests of security issuances and investment rates under political uncertainty. Section 4.6 concludes. Variable descriptions are detailed in the Appendix in Section 4.7.

4.2 Hypothesis Development

Keynesian economics presents a clear argument connecting politics with economics; in *laissez-faire* capitalist systems, decentralized economic activities may lead to suboptimal outcomes, which can be resolved through government interventions. Based on this proposition, it follows that if governments play an integral role in effecting intended economic outcomes, then any uncertainty over the stability of governments can cast doubt over the predictability of future economic states. Pástor and Veronesi (2013) show how uncertainty over the government's future actions upsets economic equilibrium, and leads to higher stock market volatility. Their theory is supported by empirical evidence, which shows that political uncertainty commands a risk premium, and contributes to market return volatility (see for example, Boutchkova, Doshi, Durnev, & Molchanov, 2012; Mei & Guo, 2004). There is also substantial evidence showing significant relationships between political instability and corporate financial policies. For instance, Julio and Yook (2012) document that managers delay investment in reaction to political uncertainty and resume plans only after the resolution of that uncertainty.[2] The findings in these studies support the identification of political uncertainty as an explicit explanatory variable in the determination of asset prices and corporate finance decisions.

In the context of corporate cash management decisions, managers should not ignore political uncertainty because it can translate to uncertainty over the firm's distribution of cash payments and receipts, potentially inducing incidents of illiquidity whenever payments exceed receipts. Now, absent capital market frictions, firms can easily raise external funds if receipts are deficient relative to payments, and risks of

[2]Julio and Yook (2012) also show very briefly that corporate cash holdings increase during national elections.

illiquidity will no longer be of concern. However, if there exists explicit and implicit costs for firms to obtain cash when it is needed, then holding cash becomes necessary because it can help firms avert illiquidity. Keynes (1936) elaborate that there are two main motives for firms to hold cash. First, when transaction costs associated with liquidating assets or issuing securities to raise cash outweigh the opportunity cost of holding cash, then firms have the incentive to build-up cash reserves. This is known as the transaction costs motive for holding cash. Second, when there are information asymmetries, external financing may become a prohibitively expensive source of funds such that firms are better-off not issuing securities, which implies that firms need to hold cash as a contingency against such situations. This motivation is known as the precautionary motive for holding cash.

It is necessary to clarify that the precautionary motive view in Keynes (1936) original definition in essence explains that managers hold cash to provide for *unpredictable* circumstances particularly related to meeting liabilities or funding investments. This is the critical point of departure from the transaction costs motive explanation. In classical models of the transactions demand for cash, Baumol (1952) assumes that a particular firm's "transactions are perfectly foreseen and occur in a steady stream". In addition, Miller and Orr (1966) assume that there is no "lead time" required to convert non-cash assets into cash, which implies that firms do not need to accumulate cash to guard against unexpected shortfalls. Both models eliminate consideration for *uncertainty* perturbing the expected distribution of a particular firm's cash inflows and outflows, and the impact of asymmetric information on raising funds externally. Therefore, the transaction cost motive by design, cannot be an appropriate explanation for changes in corporate cash holdings under political uncertainty, which leaves

the precautionary motive as the only viable explanation. Empirically, Opler et al. (1999) find convincing evidence for the precautionary motive for holding cash in a sample of non-financial U.S. firms.

The primary difficulty of establishing a relationship between the precautionary motive for holding cash and political uncertainty is a possibly endogenous relationship between economic outcomes and government instability. Many extant studies use national elections as a proxy for political uncertainty (see for example, Boutchkova et al., 2012; Julio & Yook, 2012; Mei & Guo, 2004; Pantzalis, Stangeland, & Turtle, 2000), which does not resolve the endogeneity issue. While it is conceivable that elections may generate uncertainty due to a possible regime shift in policies affecting economic outcomes, elections are prone to various characteristics that may in fact exacerbate the endogeneity problem. First, although some elections held in regular cycles[3] occur outside the control of firms and state of the economy, management can still structure corporate policies in anticipation of upcoming elections. Arguably, this implies that any uncertainty associated with the elections can be preempted and one cannot definitively conclude that political uncertainty causes certain firm outcomes. Second, elections held outside of regular cycles, also known as snap elections, usually coincide with good economic states since rational incumbent governments standing for reelection tend to use economic performance as a political tool to garner votes. Therefore, snap elections are perceivably endogenous to firm economics. Finally, the call for elections can in fact indicate a resolution of uncertainty especially in countries characterized by fledging democratic systems fraught with political unrests. Elections can definitively select which party has the popular mandate to form the

[3]Alesina, Cohen, and Roubini (1992) call such elections as having "exogenous" timing because the cycles are written in constitution and independent from economic performances.

government and put to rest any political instability. For all these reasons outlined, national elections appear to be a poor identification of political uncertainty, and the use of which in studies examining effects on corporate outcomes may produce biased inferences.

On the other hand, non-electoral incidents causing political uncertainty overcome endogeneity concerns because such incidents occur unexpectedly with hard to predict outcomes. As such, non-electoral incidents can act as strong exogenous political shocks on the economy to allow for causal inferences from tests of political uncertainty on firm outcomes. I define non-electoral political incidents as having the ability to assail the foundation of government stability and create political impediments to the government's normal functioning, sometimes to the extent of causing outright collapse. This is in line with Alesina and Perotti (1996) who explain that the essence of political uncertainty should contain threats to government change based on the assumption that only political turnover can create policy changes relevant for economic decisions. Huang et al. (2015) use an alternative definition of political uncertainty: "disruptive interactions between two or more nations, which may lead to a heightened probability of military hostilities...and challenge the structure of an international system.". This definition, termed "political crisis", is problematic for two reasons. First, it wholly excludes uncertainty from domestic politics, which should have a larger and more direct impact on local firm outcomes than political uncertainty from foreign nations. Second, there are confounding sources of uncertainty encapsulated in that definition, which are not necessarily of a political nature in a strict sense. Military action could be reactions to national security threats such as terrorist activities or incursions on geographic sovereignty, retaliations against

unsuccessful trade talks or sanctions, or even motivated by religious beliefs. While I acknowledge that these events could contribute to aggregate economic uncertainty, they should be more accurately classified as foreign policy instability, which may not have any implications on domestic policy changes.

The empirical strategy of this paper uses the exogenous non-electoral incidents as a natural experimental setting to investigate the effects of political uncertainty on corporate cash management policies. This will effectively mitigate any endogeneity concerns between political uncertainty and changes to cash holdings, and allows for unbiased causal inferences. Based on the precautionary motive for holding cash, when faced with political uncertainty, firm managers are expected to increase cash levels to guard against the heightened risk of illiquidity since the uncertainty casts doubt over a particular firm's future cash disbursements. I formalize the central hypothesis of this paper as follows:

Hypothesis *Non-electoral political uncertainty causes firms to increase their cash levels on a precautionary basis because the uncertainty is perceived to amplify the variability of net disbursements. The rational decision-maker reacts to the heightened risk of illiquidity by increasing cash contingencies.*

When countries experience incidents of non-electoral political uncertainty, the magnitude of the resulting economic impact should depend on the political characteristics of the incumbent government. This is because the strength of the overall political structure of a country determines whether political institutions can withstand uncertainty and counter its adverse effects on the business environment. It follows

that if there is heterogeneity in the competence and performance of governments, then there should also be variations in firm policy responses across countries when incidents of political uncertainty occur. I expect firms in countries with higher quality governments to perceive the risk of illiquidity as a result of political uncertainty to be lower, and consequently increase their precautionary cash balances by less than firms in countries with lower quality governments. I also investigate whether there are any spillover effects of domestic political uncertainty to other countries. Given the close economic ties and geographic proximities of countries in East Asia, I hypothesize that firms perceive political uncertainty from neighboring countries to have a destabilizing effect on the region's commercial activities and also react by increasing cash holdings.

In the next section, I illustrate the relationship between non-electoral political uncertainty and corporate cash levels within the confines of a static tradeoff model. Firm managers hold cash as a precaution against uncertainty over net disbursements, but holding cash carries with it loss income from investing in higher interest-bearing assets. The optimal cash level is attained when the tradeoff between the benefits and costs of holding cash is at its margin.

4.2.1 Theoretical Prediction

I present a simple constant-cost of illiquidity model for the optimal precautionary cash holdings following Whalen (1966), but I augment the model by the uncertainty from non-electoral incidents. The firm manager minimizes the expected total cost, TC, of holding cash, which stems from the lost income of investing the cash in income-earning assets and the cost from an incident of illiquidity. The cost from

lost income is commonly referred to as the opportunity cost, which is the product of cash holdings balance, M, and the market rate of income-earning assets, r. The expected cost of an incident of illiquidity is the product of the cost of an incident of illiquidity, c, and the probability of a cash deficiency. A cash deficiency occurs when the disbursements, D, exceeds M. I assume that D is a continuous random variable with normal probability density function $f(D)$. Then the expected cost from an incident of illiquidity is

$$c \int_M^\infty f(D) dD.$$

To demonstrate that incidents of political uncertainty have an incremental effect on the probability distribution of cash deficiency, I augment the expression above by the probability of the occurrence of a non-electoral incident. Let this probability be $p \in \mathbb{R}$, and the incident be $I \in \{0, 1\}$. Then, the probability mass function of the discrete random variable I, is

$$f(I) = \begin{cases} p & \text{for } I = 1 \\ (1-p) & \text{for } I = 0 \end{cases}$$

Under uncertainty, p must be in the interval $(0, 1)$. Then, $f(I)$ is a Bernoulli distribution, which can be expressed as

$$f(I) = p^I (1-p)^{1-I} \quad \text{for } I \in \{0, 1\}.$$

Without loss of generality, I assume that the cost of illiquidity due to an incident of political uncertainty remains as c. Therefore, the expected cost of illiquidity attributable to the non-electoral incident is given by

$$c p^I (1-p)^{1-I} \int_M^\infty f(D) dD$$

Then, the expected total cost of precautionary cash holdings will be

$$TC = Mr + c[1 + p^I(1-p)^{1-I}] \int_M^\infty f(D)dD \quad \text{for } I \in \{0,1\} \tag{4.1}$$

Taking the first order condition of Equation (4.1) with respect to M, and given $f(D)$ follows a normal distribution with mean $\overline{D}$ and variance σ_D^2, we get

$$\frac{\partial TC}{\partial M} = r - \frac{c[1 + p^I(1-p)^{1-I}]}{\sigma\sqrt{2\pi}} \exp\left\{\frac{-(M-\overline{D})^2}{2\sigma_D^2}\right\} = 0 \tag{4.2}$$

Rearranging Equation (4.2) and using M^* to denote the optimal precautionary cash holdings, we have the following expression:

$$M^* = \overline{D} + \sigma_D \sqrt{2\ln\left\{\frac{c[1 + p^I(1-p)^{1-I}]}{r\sigma_D\sqrt{2\pi}}\right\}} \tag{4.3}$$

We can observe directly from Equation (4.3) that the optimal precautionary cash holdings balance varies *positively* with the cost of illiquidity. Moreover, when non-electoral incidents causing political uncertainty occur, the cost of illiquidity is amplified and accordingly, increases the optimal precautionary cash holdings. Consistent with the central hypothesis of this paper, the model predicts a positive relationship between political uncertainty and the level of cash holdings.

4.3 A Brief History of Political Uncertainty in East Asia

In this section, I provide an overview of the political climate in East Asia, and describe key non-electoral events leading to political uncertainty that happened in the last quarter century in each of the six countries/territories in this study's final sample.

Post-modern era politics in many East Asian countries can be characterized by complex dynamics involving the inertia to completely eradicate legacy systems of monarchism and authoritarianism, and the struggle to govern by the rule of law based on principles of democracy. When Marxist ideologies started to significantly permeate East Asia after the second World War, several countries succumbed to its influence and installed communism as a more palatable solution. Where democracy has succeeded, in the sense that some form of "free and fair" elections are held to select leaders of government, few are consistently stable.

Often, the nascent democratic systems in East Asia are interrupted by periods of military coups where elections are suspended or dominated by pseudo-democratic autocracies where the outcome of elections have little bearing on the selection of government. Therefore, the primary source of political uncertainty in East Asia stems not from elections per se, but from widespread incidents of political unrests aimed at unseating incumbent governments. Some of these incidents emerge because governments are perceived to have usurped upon democratic principles through manipulating political institutions to preserve control. Such incidents of political unrests are often manifested as mass pro-democracy rallies, which have profound

adverse implications for political and economic stability.

Hong Kong—Although Hong Kong continues to hold legislative elections after returning to Chinese rule in 1997 as a Special Administrative Region, political power is held by the chief executive of Hong Kong. He or she has the authority to decide socio-economic policies and introduce legislation in strict consultation with the Chinese government. Consequently, the outcomes of legislative elections hardly introduce any political uncertainty in Hong Kong. The major source of political uncertainty comes from demonstrations initiated by pro-democracy supporters who vehemently oppose any legislation or policy perceived to infringe upon the democratic rights of Hong Kong residents. In 2002, when *Basic Law Article 23*, a broad-spectrum legislation prohibiting subversive acts against the Chinese government was passed, massive protests against China's authoritarian rule took place. The protests continued into 2004, and at one point more than 700,000 people took to the streets. Thus, began a series of large-scale protests calling for universal suffrage in Hong Kong. The most significant one occurred in 2014, colloquially called the *Umbrella Movement* or *Umbrella Revolution*, when opponents of China's decision to reform Hong Kong's electoral system such that candidates for chief executive must be pre-selected by the Chinese Communist Party staged public demonstrations. The intensity of this movement escalated rapidly to the point that there were over a 100,000 protesters at any given time blockading key business districts and government buildings. The authorities' inability to quell the protests, which eventually lasted four months, added to the uncertainty of Hong Kong's political and economic future. As commerce and trade were severely interrupted during this period, losses in revenue particularly in retail and tourism were estimated at US$5 billion.

Indonesia—While Indonesia has had democratic elections under a presidential representative framework since 1955, there was an extended period during which the Indonesian government functioned more like a military dictatorship. This occurred when Suharto, a commander of the Indonesian Armed Forces, ousted the founding president, Sukarno, in 1967 and declared himself president. Although legislative elections were held regularly, control of government resided with President Suharto until his forced resignation in 1998. Therefore, from an electoral viewpoint there was hardly any political uncertainty. Leading up to the 1997 legislative elections, a confrontation between supporters of the opposition *Partai Demokrasi Indonesia*, the Indonesian Democratic Party, led by Megawati, the daughter of Sukarno, and government agents escalated into violent riots. The ruling *Golkar* party considered Megawati a major threat and sent soldiers and police to crush opposition supporters. After the elections, in which *Golkar* won a landslide majority of 74% of the votes, protests spread to campuses with students alleging vote rigging and calling for political reforms. By 1998, the riots not only spread to other cities, but also evolved into a civil armed conflict that became racially motivated. Chinese-owned homes, businesses, and establishments were looted and destroyed; property damage alone was estimated at US$238 million. Suharto eventually relinquished control after 32 years in power.

Malaysia—Since independence from British rule in 1963, Malaysia has been ruled by right-wing *Barisan Nasional*(BN), which translates to The National Front party. The constitution of Malaysia requires general elections at the federal level to be held at least once every five years. Consistently, BN has won the majority of 222 seats in parliament at every election and retained control. However, the party's share of

popular vote has been declining since the late 2000's. This trend has its origin in an increasing dissatisfaction by electors over how the government oppresses opposition and political dissent even from within its own party. When former prime minister Mahathir Mohamad sacked his deputy, Anwar Ibrahim in 1998 on alleged charges of corruption and sodomy, the incident sparked a widespread protest movement coined *Reformasi* aimed at ousting PM Mahathir Mohamad on the allegation that he propagated a culture of corruption and cronyism in Malaysian politics. Over the next decade, several large-scale demonstrations known as *Bersih Rally* calling for electoral reforms after alleged discrepancies in elections favoring the ruling party were held. These rallies sometimes turned violent and caused the shutdown of major commercial districts in Kuala Lumpur.

Philippines—After The Philippines officially became an independent republic in 1946 when the U.S. ended its colonial rule, democratic elections are held regularly to choose the president, members of congress, and other public officials under a framework very similar to that of the U.S. However, Filipino politics is plagued by an insalubrious relationship between politicians and family wealth. Very often, the Filipino electorate selects populist presidents who are from well-known and highly-regarded families. Therefore, whenever there are high-profile presidential candidates, there is very little uncertainty regarding election outcomes. For instance, in the 1998 presidential elections with six contestants, Joseph Estrada won nearly 40% of the popular vote. Similar to other burgeoning democracies in Asia, much of the political uncertainty in The Philippines revolve around protests and corruption scandals. In 2000, impeachment proceedings started against President Estrada under the allegation he had plundered public funds. And, when the impeachment court

ceased proceedings in 2001, it led to a political protest called the *EDSA Revolution II* aimed at removing President Estrada from office, which turned out to be successful. This protest was essentially a *de facto* coup and the lack of regard for political due process threw Filipino politics into chaos. In 2005, known as the *Hello Graci* scandal, President Gloria Arroyo was alleged to have rigged the 2004 elections in her favor. A state of emergency was subsequently declared in 2006 and martial law was imposed after President Arroyo claimed there was an attempted coup against her government. The frequent occurrence of such political scandals undermines political stability and has impeded the economic progress of The Philippines.

Taiwan—Before 1996, Taiwan did not hold any direct elections to select the President, who is both the head of state and government. The ruling *Kuomintang*, The Nationalist Party, would select a leader from among its political ranks to govern. When Lee Teng-hui became the first directly elected president of Taiwan in 1996, China reacted by launching missiles close to the Taiwanese border as a warning against any pro-independence agenda.[4] The primary opposition party, *The Democratic Progressive Party* (DPP), did not take control of the presidency until 2001 when its candidate, Chen Shui-bian won the elections. Traditionally, the DPP, especially during Chen's presidency, took a stronger pro-independence stance than the *Kuomintang*, which rattles the Chinese government. It is therefore tempting to argue that presidential elections in Taiwan create political uncertainty because if the DPP were to win, one could expect adverse reactions from China that would threaten Taiwan's security and economy. However, regardless which party forms the government, the probability of adverse reaction from China remains because

[4]The Chinese government regards Taiwan as a renegade province that must eventually be reunited with mainland China by force, if necessary.

of the tenuous relationship. Thus, the more important question is what are the other unanticipated events that add to the political uncertainty of Taiwan. These events include an assassination attempt on President Chen Shui-bian in 2004 when he was campaigning for reelection, a protest in 2006 by Chen's opponents against a failed attempt to remove him from office under allegations of corruption, another protest in 2008 against President Ma Ying-jeou's pro-China policies, and a large-scale demonstration termed *The Sunflower Movement* against the signing of a trade agreement with China widely seen as damaging to Taiwan's economy and an implicit acceptance of China's influence over Taiwanese politics. All these events heightened the political uncertainty facing Taiwan.

Thailand—In the last 25 years, Thailand's military has overthrown the elected government and seized control three times with two coups occurring in the last decade alone. The most recent coup happened in 2014 when the military placed former PM Yingluck Shinawatra under house arrest, dissolved parliament, and established a military junta. Interestingly, this coup is closely related to the previous coup in 2006 when PM Thaksin Shinawatra, who is in fact Yingluck Shinawatra's elder brother, was also ousted by the military. After winning the general elections in 2001, Thaksin's term as PM was riddled with controversies especially conflicts of interest in connection with his multi-billion dollar family business, the Shin Corporation. When Thaksin won his second term in 2005, widespread protests calling for his resignation ensued, culminating in a military coup. These protests are frequently violent and accompanied by bloody military crackdowns, the most infamous of which is the "red shirts vs. yellow shirts" protest, which precipitated into a state of emergency in Bangkok in 2008. Similarly, the 2014 coup was accompanied by

violent anti-government protests described as *Operation Occupy Bangkok*. The uncertainty revolving around the resolution of these unrests had severe repercussions on Thailand's economy. For instance, foreign investors withdrew an estimated US$3 billion in capital since the latest series of protests began in 2013. The tourism industry, which is a key contributor to the Thai economy, also experienced sharp downturns.

4.4 Data

4.4.1 Incidents of Non-Electoral Political Uncertainty

I hand-collect all non-electoral incidents that lead to political uncertainty occurring in Hong Kong, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand from 1990 to 2014. I define these incidents as (1) peaceful or violent widespread political demonstrations, (2) attempted or successful coups *d'état*, (3) attempted or successful assassinations on the head of government, (4) political scandals of which the head of government is under investigation for or found guilty of corrupt practices (not restricted to a financial sense), and (5) declarations of a state of emergency or impositions of martial law in response to any of the above incidents. I exclude resignations of the head of government, and dissolutions of parliament from the definition because these incidents are usually soon followed by the call for elections. This implies that it would be difficult to disentangle the resulting political uncertainty between the incidents and the elections.

I start with web scraping Factiva using a text "grepping" technique to find all news articles fitting the definition of non-electoral political uncertainty by searching

for terms and their variations or constituent words such as "political protests", "anti-government demonstrations", "pro-democracy rallies", "military coups", "political scandals", "assassination attempts", and "state of emergency". I then read through each article to determine whether the cause of the incident fits the definition. Next, I carefully verify the authenticity of the news report through several steps. If the article is published by a news agency with a local-centric readership (for example, *The South China Morning Post* from Hong Kong; *New Straits Times* from Malaysia; *Bangkok Post* from Thailand, etc.), I use Google's search engine to find a corresponding article published by internationally-renowned news agencies. The international news agencies include, but are not limited to, *Associated Press* (AP), *British Broadcasting Corporation* (BBC), *Cable News Network* (CNN), *Wall Street Journal* (WSJ), *Reuters*, and *The New York Times*. The purpose of this step is to ensure that the content of the local news report has not been adulterated as a result of undue censorship from the government or biasness from the local journalists. And, the fact that the local news article can be independently-verified by international news agencies connotes the significance of the reported incident of political uncertainty. Once the article from the international news agency verifies the content of the local article, I conduct a second search for a corresponding article from another international news agency so that I can verify the consistency of the content to ensure that there are no conflicting accounts of the cause or circumstance of the political incident, and the incident continues to fit the definition of political uncertainty in this study. News articles that do not pass the verification steps are omitted from the data.

The final dataset consists of 37 non-electoral political incidents from 6 countries.

I omit Japan[5], Korea[6], and Singapore[7] from the dataset because none of the defined incidents of political uncertainty occurred in these three countries during the sample period. Of the 37 incidents, 27 are political demonstrations, 3 are military coups, 5 are political scandals, 1 is an assassination attempt, and 1 is a declaration of a state of emergency in response to an attempted coup *d'état*. Since one of the key strengths of this study is the separate identification of political uncertainty from non-electoral events and from elections, it is critical for the identified incidents to have a low correlation with elections. I check whether each of the 37 incidents occurred in the same year as elections were held, and find a total of 10 such incidents. 7 of the incidents are political protests, 2 are political scandals, and the remaining 1 is the assassination attempt. Only 3 of the 10 incidents are closely-related to elections that occurred either before or after the incidents happened. The remaining incidents that coincide with elections called in the same year are not direct causes or consequences of the elections or their outcomes. In robustness checks, I exclude these

[5]It is very common in Japan for the prime minister to resign before his term ends. From 1990 to 2014, there were eight changes in the prime minister, five of which occurred from 2006 to 2011. The most common reason for resignation is to accept responsibility for the party's poor approval ratings. For instance, the current PM of Japan, Shinzo Abe, was actually appointed PM in 2006 by the ruling Liberal Democratic Party after PM Junichiro Koizumi resigned. Abe subsequently resigned in 2007 citing poor health and low approval ratings. This consistent and frequent pattern of change in head of government has become mainstream in Japanese politics to the point that it hardly introduces any political uncertainty especially since the new PM is always selected from among the ruling party ranks who continues the previous PM's policies. Snap elections are also called soon after a change in PM.

[6]In March 2004, President Roh Moo-hyun openly endorsed the Uri Party ahead of national elections. He had formed the Uri Party in 2003 after leaving his original political party, the Millennium Democratic Party. This endorsement constituted a technical violation of required political impartiality by the sitting President, and opposition lawmakers moved to impeach Roh. Two months later, the Korean Constitutional Court overturned the impeachment motion. I would have considered the impeachment incident as a political scandal, but since the impeachment decision was reversed and very short-lived, I exclude this observation from the dataset. Other than this incident, most of Korea's uncertainty stems from military tensions with North Korea, which falls outside the definition of political uncertainty in this study.

[7]Singapore is perhaps the most politically-stable country in Asia. Since the formation of an independent republic in 1965, the founding political party, the People's Action Party, has won every general election and forms the government. There was a riot in 1969, but it was due to racial tensions between the ethnic Chinese majority and the Malay minority. No other similar incidents of a political nature has occurred in Singapore. From a electoral and non-electoral viewpoint, Singapore hardly experiences any form of political uncertainty.

three incidents from empirical tests and find no appreciable change in the results.

4.4.2 Country-Level Data and Variables

In the empirical tests that follow, I control for political uncertainty arising from national elections that determine the head of government. Indonesia, Philippines, and Taiwan conduct presidential elections to select the head of government. Malaysia and Thailand adopt the parliamentary system and hold legislative elections to decide which political party has the popular mandate to form the government; the winning party chooses a prime minister to become the head of government. In Hong Kong, elections are held to select the chief executive, who is the head of government.[8] I collect data from The Database of Political Institutions[9](DPI) on presidential elections for countries with a presidential system[10], and legislative elections for countries with the parliamentary system. I rely on various internet sources for election data on Hong Kong since this data is unavailable in DPI. For the purpose of this study, only the years when elections were held are required. The variables DATELEG and DATEEXEC in DPI show the month and year of presidential and parliamentary elections, respectively.

I further collect measures of governance standards for each country and use them to control for variations in political characteristics across countries. The Worldwide Governance Indicators (WGI)[11] is a database that reports six indicators of quality

[8]But unlike elections in the other five countries, only the Election Committee consisting of 1,200 members can vote to select Hong Kong's chief executive. Eligible candidates for the chief executive position must have received at least 150 nominations from the Election Committee before they can run for office.

[9]This database is maintained by the Development Research Group at The World Bank and can be found at http://go.worldbank.org/2EAGGLRZ40.

[10]Indonesia, Philippines, and Taiwan also conduct legislative elections, but these do not determine the head of government.

[11]WGI is an initiative of The World Bank. The data can be accessed at www.govindicators.org.

and performance of the government in 215 countries and territories from 1996 to 2014. The six governance indicators (variable names italicized in parentheses) are Voice and Accountability (VA), Political Stability and Absence of Violence/Terrorism (PV), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL), and Control of Corruption (CC). The indicators are reported in standard normal units ranging from -2.5 to 2.5 with higher units indicating better quality or performance. For details on the methodology, see Kaufmann, Kraay, and Mastruzzi (2010). Panel A of Table 4.1 presents summary statistics for all the country-level variables.

4.4.3 Firm-Level Data and Variables

I collect firm-level data from Thomson Reuters Worldscope database for firms listed on the stock exchanges of the six countries in this study's sample from 1990 to 2014. I exclude financial and utility firms with SIC codes ranging from 6000 to 6999, and from 4900 to 4949. Firm-year observations with negative book values of assets, cash, or shareholder's equity are considered erroneous data and removed from the sample. In the analyses that follow, the main variables are *Cash*, Tobin's *Q*, *Cash Flow*, firm *Size*, *Leverage*, and *Capex*. Firm-year observations with missing values for these variables are also removed from the sample. Panel B of Table 4.1 shows the summary statistics of the main firm-level variables. The Appendix provides details on variable definitions and construction.

4.5 Empirical Results

The first set of results show changes in corporate cash holdings during the occurrence of non-electoral incidents and elections. The evidence aims to prove that political

Table 4.1: Descriptive Statistics

Panel A reports descriptive statistics for non-electoral political incidents, national elections, and six measures of political governance from 1990 to 2014. The political governance measures are Voice and Accountability (VA), Political Stability and Absence of Violence/Terrorism (PV), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL), and Corruption Control (CC). Panel B reports descriptive statistics for the main firm-level variables used in this study. Panel C reports descriptive statistics for cash holdings level in years when non-electoral political incidents occur and compares it to the level in years when no incidents occur. Cash holdings level is defined as cash and cash equivalents scaled by book value of total assets. See the Appendix for details of variable descriptions.

Panel A: Country Characteristics			
	Mean	Median	Std. Dev.
Incidents/year	1·7	2·0	1·0
Elections/year	1·8	1·0	1·5
VA	0·1469	0·1179	0·5097
PV	0·1476	0·4679	0·9021
GE	0·8640	1·0505	0·6866
RQ	0·8738	0·8366	0·7984
RL	0·5759	0·6406	0·7260
CC	0·5404	0·5129	0·9142
Panel B: Firm Characteristics			
	N	Mean	Median	Std. Dev.
Cash	47,930	0·1549	0·1063	0·1542
Q	47,930	0·6819	0·7727	0·3682
Cash Flow	47,930	0·0727	0·0749	0·1542
Size	47,930	15·1888	14·6730	2·8799
Leverage	47,930	0·2532	0·2083	0·2512
Investment	47,930	0·0630	0·0316	0·0883
Panel C: Cash Holdings in Incident Years vs. Non-Incident Years			
Incident Years		0·1577	0·1091	0·1548
Non-Incident Years		0·1536	0·1049	0·1539
Difference		0·0041		
t-stat		3·1822		

uncertainty causes changes in cash holdings, and that non-electoral incidents are a better identification of political uncertainty. Next, I conduct cross-country analyses to show how better political governance can mitigate the effects of non-electoral political uncertainty, and the spillover effects to neighboring countries. The third set of results from robustness and additional tests addresses concerns over specifications and alternative explanations. In the final set of results, I show how non-electoral political uncertainty affects security issuances and capital expenditures.

4.5.1 Baseline Analysis

Panel C of Table 4.1 provides the first piece of evidence showing the increase in cash holdings during years when non-electoral political incidents occur. The mean and median cash levels measured by cash scaled by assets during non-incident years are 0.1536 and 0.1049, respectively. They increase to a mean and median of 0.1577 and 0.1091, respectively, during years when incidents occur. The difference in the mean cash levels represents a 2.7% increase during incident years and statistically significant at the 1% level.

Next, I investigate the causal effects of political uncertainty on cash holdings in a regression framework. For all subsequent tests, cash holdings is defined as the natural log of cash scaled by book value of assets, unless otherwise stated. In univariate tests, I separately examine effects of the two sources of political uncertainty; non-electoral political incidents (*Incident*), which takes a value of 1 in years when incidents occur and 0 otherwise, and national elections (*Election*), which takes a value of 1 in years when elections are held and 0 otherwise. And in bivariate tests, I include both *Incident* and *Election* in the regression. Columns (1) to (3) of Table 4.2 show results

from OLS regressions without any fixed effects. And, columns (4) to (6) show results from panel regressions, which include firm and year fixed effects. Consistently, the variable *Incident* has a positive coefficient significant at the 1% level. This shows that managers increase their firms' cash balances during years when there is political uncertainty from non-electoral incidents. Conversely, coefficients on the variable *Election* not only have inconsistent signs, they are also not significant. The univariate results show that national elections per se do not seem to induce any cash policy changes in firms. In fact, from the results of bivariate tests, when non-electoral political incidents and elections occur in the same year, only the incidents causes increases in cash balances.

To control for firm-specific characteristics, I perform multivariate regressions of the following model:

$$\begin{aligned} Cash_{ijk,t} = \beta_0 &+ \beta_1 Incident_{j,t} + \beta_2 Election_{j,t} + \beta_3 Q_{ijk,t-1} + \beta_4 CF_{ijk,t} + \beta_5 Size_{ijk,t-1} \\ &+ \beta_6 Lev_{ijk,t-1} + \beta_7 Capex_{ijk,t} + \beta_8 IndVol_{k,t} \\ &+ \beta_9 Div_{ijk,t} + \eta_i + \tau_t + \varepsilon_{ijk,t}, \end{aligned} \tag{4.4}$$

where i indexes firm, j indexes country, k indexes industry, and t indexes year. Q is Tobin's Q defined as the ratio of market value of assets to book value of assets. Market value of assets is the sum of book value of assets and market value of common equity less the sum of deferred taxes and book value of common equity. CF is cash flow defined as the sum of net income before extraordinary items and depreciation scaled by beginning-of-period book value of assets. $Size$ measures firm size calculated as the natural log of the book value of assets. Lev is the ratio of total debt to book

value of assets. $Capex$ is net capital expenditures scaled by beginning-of-period book value of assets. $IndVol$ is the cash flow volatility of two-digit SIC industry computed as the standard deviation of industry cash flows over the past four years. Div is a dummy variable equals to 1 if a firm pays cash dividend in year t, and 0 otherwise. η_i, τ_t, and $\varepsilon_{ijk,t}$ denote firm fixed effects, year fixed effects, and residuals, respectively.

Columns (7) to (9) of Table 4.2 presents the results. Once again, the coefficient on *Incident* is positive and statistically significant while *Election* remains an insignificant determinant of changes to cash holdings. The evidence here corroborates the descriptive evidence, and supports the hypothesis that political uncertainty from non-electoral incidents causes firm managers to increase cash contingencies. Notice however, that none of the coefficients on *Election* in all tests show up as statistically significant. Moreover, the coefficients signs are also unstable. This evidence suggests that national elections per se are unreliable proxies for political uncertainty.

Table 4.2: Baseline Results

The table reports estimation results from variations of the main cash holdings regressions specified in Equation (4) examining the effects of political uncertainty from non-electoral incidents and national elections on cash levels. The dependent variable is the natural log of cash and cash equivalents scaled by book value of total assets. $Incident_t$ is an indicator variable taking on a value of 1 if a non-electoral political incident occurs, and 0 otherwise. $Election_t$ is an indicator variable taking on a value of 1 if a national election occurs, and 0 otherwise. Cash flow (*CF*), investment rates (*Capex*), industry cash flow volatility (*IndVol*), and cash dividends (*Div*) are measured contemporaneously, while Tobin's Q (*Q*), firm size (*Size*), leverage (*Lev*) are lagged by one year. See the Appendix for details of variable definitions. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. Coefficients marked with ***, **, and * are statistically significant at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Incident_t	0·0409***		0·0409***	0·0629***		0·0634***	0·0514***		0·0516***
	(3·2254)		(3·2206)	(6·6138)		(6·6254)	(5·4801)		(5·4639)
Election_t		−0·0024	0·0004		−0·0028	0·0051		−0·0047	0·0016
		(−0·1792)	(0·0292)		(−0·2598)	(0·4720)		(−0·4457)	(0·1521)
Q							0·0758***	0·0791***	0·0758***
							(3·9485)	(4·1223)	(3·9476)
CF							0·8451***	0·8416***	0·8451***
							(24·5509)	(24·4468)	(24·5511)
Size							−0·1703***	−0·1739***	−0·1703***
							(−21·4161)	(−21·9418)	(−21·4114)
Lev							−0·4977***	−0·4979***	−0·4977***
							(−20·2121)	(−20·2162)	(−20·2121)
Capex							−0·4715***	−0·4745***	−0·4715***
							(−7·6981)	(−7·7448)	(−7·6982)
IndVol							0·0815***	0·0760***	0·0814***
							(4·6975)	(4·3852)	(4·6890)
Div							−0·0754	−0·0783	−0·0754
							(−1·1508)	(−1·1934)	(−1·1496)
Fixed Effects	None	None	None	Firm	Firm	Firm	Firm	Firm	Firm
				Year	Year	Year	Year	Year	Year
Observations	47,930	47,930	47,930	47,930	47,930	47,930	47,930	47,930	47,930
R^2	0.0002	0.0000	0.0002	0.0320	0.0311	0.0320	0.0679	0.0673	0.0679

4.5.1.1 Persistence Effects

As an extension to the baseline analysis, I examine whether the effects of political uncertainty on cash management policies persist. I rely on a general prior from the policy sciences literature postulating how unstable political systems often result in policy outcomes that may require extended periods to reverse or correct. This implies that it is possible for firm managers to maintain cash management policies in response to events introducing political uncertainty over a length of time after the first occurrences of these events. While the persistence effects argument is reasonable, there is however, a lack of an a priori expectation of how long such persistence should last. Notwithstanding this limitation, I use the 1-year and 2-year lags of *Incident* to test whether cash holdings change in response to non-electoral political incidents one and two years after their first occurrences. This should shed some light on the persistence effects of political uncertainty on cash policy within the limitation discussed. Table 4.3 presents interesting results. In columns (1) and (2), the results show that cash levels continue to increase in response to incidents that occurred one year and two years ago, respectively.[12] Additionally, note that the magnitude of the response differs. Firms increase their cash holdings more one year after the incident occurred than two years later. This suggests that the effects of political uncertainty wane as time progresses and firms alter their cash policy responses accordingly. In columns (3) to (5) I explore various combinations of contemporaneous and lagged *Incident*. And, in column (6) I use contemporaneous and lags of *Incident* in the same regression and the results show a step-down in increases of cash levels from 0.0435 to 0.0187. The evidence suggests two interesting facts; (1) political uncertainty from

[12]In unreported results, coefficients of further lags of *Incident* included in the regressions show no statistical significance in causing changes to cash holdings.

non-electoral incidents persist for a period of time, and (2) managers continue to remain cautious after uncertainty first permeates the political climate, but they conscientiously attenuate cash policy responses as uncertainty subsides.

Table 4.3: Persistence Effects of Political Uncertainty from Non-Electoral Incidents

The table reports estimation results from regressions examining cash holdings of firms after the first occurrence of a non-electoral political incident. The dependent variable is the natural log of cash and cash equivalents scaled by book value of total assets. $Incident_{t-1}$ and $Incident_{t-2}$ are indicator variables, which take a value of 1 if $Incident_t = 1$, and 0 otherwise. Cash flow (CF), investment rates ($Capex$), industry cash flow volatility ($IndVol$), and cash dividends (Div) are measured contemporaneously, while Tobin's Q (Q), firm size ($Size$), leverage (Lev) are lagged by one year. See the Appendix for details of variable definitions. All specifications include firm and year fixed effects. Standard errors are clustered by firm. t-statistics are reported in parentheses. Coefficients marked with ***, **, and * are statistically significant at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Incident_{t}			0·0444***	0·0476***		0·0435***
			(3·7817)	(3·8132)		(4·5007)
Incident_{t-1}	0·0367***		0·0272**		0·0300***	0·0217**
	(3·0051)		(2·5030)		(2·6919)	(2·2432)
Incident_{t-2}		0·0298***		0·0227**	0·0235**	0·0187**
		(2·5975)		(2·0727)	(2·2863)	(1·9606)
Q	0·0761*	0·0747*	0·0742*	0·0724*	0·0721*	0·0707***
	(1·7990)	(1·7670)	(1·7580)	(1·7167)	(1·7080)	(3·6861)
CF	0·8365***	0·8308***	0·8400***	0·8343***	0·8295***	0·8331***
	(13·1400)	(13·0672)	(13·2116)	(13·1430)	(13·0523)	(24·2642)
Size	−0·1718***	−0·1722***	−0·1694***	−0·1694***	−0·1702***	−0·1682***
	(−9·5523)	(−9·5970)	(−9·4015)	(−9·4197)	(−9·4677)	(−21·0566)
Lev	−0·4951***	−0·4897***	−0·4948***	−0·4895***	−0·4900***	−0·4897***
	(−9·4465)	(−9·3696)	(−9·4410)	(−9·3661)	(−9·3765)	(−19·9028)
Capex	−0·4746***	−0·4632***	−0·4729***	−0·4611***	−0·4611***	−0·4597***
	(−4·9800)	(−4·8743)	(−4·9618)	(−4·8518)	(−4·8519)	(−7·4960)
IndVol	0·0723**	0·0726**	0·0784***	0·0794***	0·0702**	0·0770***
	(2·5039)	(2·5180)	(2·7114)	(2·7494)	(2·4254)	(4·4179)
Div	−0·0752	−0·0789	−0·0737	−0·0761	−0·0764	−0·0746
	(−0·9670)	(−1·0155)	(−0·9486)	(−0·9820)	(−0·9834)	(−1·1420)
Fixed Effects	Firm	Firm	Firm	Firm	Firm	Firm
	Year	Year	Year	Year	Year	Year
Observations	47,838	47,689	47,838	47,689	47,689	47,689
R^2	0.0677	0.0673	0.0681	0.0678	0.0675	0.0679

4.5.2 Cross-Country Analysis

4.5.2.1 Political Governance Variations

It is reasonable to expect that some inherent characteristics of a particular country's political system can determine whether the effects of political uncertainty are mitigated or exacerbated. Proceeding with this line of inquiry, I interact *Incident* with various measures of the one-year lag of political governance characteristics (*PolGov*). The signs of the coefficients on the interaction term *Incident* $\times$ *PolGov* will show the differential effects of non-electoral political uncertainty on cash holdings given variations in political governance standards. Firms in countries with better political governance should respond less severely to political uncertainty under the assumption that stronger governments are more capable at restoring normal functioning to political and economic institutions should there be any disruptions. Therefore, conditional on the occurrence of a non-electoral political incident, all else equal, firms in countries with better political governance at the beginning of the period should increase their cash holdings by less as a precaution against political uncertainty compared to firms in countries with poorer political governance standards.

Columns (1) to (6) of Table 4.4 shows the results when each of the six proxies for political governance characteristics is interacted with the occurrence of a non-electoral political incident. The six proxies capture three broad aspects of political governance standards, and I quote the definitions directly from Kaufmann et al. (2010); (1) *VA* and *PV* measure "the process by which governments are selected, monitored, and replaced", (2) *GE* and *RQ* measure "the capacity of the government to effectively formulate and implement sound policies", and (3) *RL* and *CC* measure "the respect of citizens and the state for the institutions that govern economic and

Table 4.4: Cross-Country Political Variations

The table reports estimation results from regressions examining the differential effects of non-electoral political uncertainty on cash holdings from cross-country variations in political governance. The dependent variable is the natural log of cash and cash equivalents scaled by book value of total assets. The explanatory variable of interest is the interaction of *Incident* and political governance (*PolGov*). *PolGov* represents each one of the six political governance measures in separate columns, which are Voice and Accountability (*VA*), Political Stability and Absence of Violence/Terrorism (*PV*), Government Effectiveness (*GE*), Regulatory Quality (*RQ*), Rule of Law (*RL*), and Corruption Control (*CC*). Cash flow (*CF*), investment rates (*Capex*), industry cash flow volatility (*IndVol*), and cash dividends (*Div*) are measured contemporaneously, while political governance (*PolGov*), Tobin's Q (*Q*), firm size (*Size*), leverage (*Lev*) are lagged by one year. See the Appendix for details of variable definitions. All specifications include firm and year fixed effects. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. Coefficients marked with ***, **, and * are statistically significant at the 1%, 5%, and 10% level, respectively.

	VA	PV	GE	RQ	RL	CC
	(1)	(2)	(3)	(4)	(5)	(6)
Incident_{t}	0·0484***	0·0556***	0·1011***	0·0696***	0·1001***	0·0614***
	(3·8366)	(4·3771)	(3·7706)	(3·1192)	(5·1868)	(3·8547)
$\text{Incident}_{t} \times$	−0·0519***	−0·0340**	−0·0501**	−0·0243*	−0·0678***	−0·0220**
PolGov	(−2·7667)	(−2·2933)	(−2·1934)	(−1·8414)	(−3·1503)	(−2·0449)
PolGov	−0·0127	0·0242	−0·3581***	−0·1171**	−0·2152***	0·0395
	(−0·3035)	(0·9077)	(−4·9082)	(−2·0559)	(−4·2041)	(1·4169)
Q	0·0594***	0·0594***	0·0518***	0·0579***	0·0565***	0·0591***
	(3·1140)	(3·1129)	(2·7137)	(3·0336)	(2·9619)	(3·0927)
CF	0·7903***	0·7897***	0·7910***	0·7890***	0·7971***	0·7886***
	(23·3203)	(23·2990)	(23·3426)	(23·2778)	(23·5247)	(23·2625)
Size	−0·1742***	−0·1753***	−0·1745***	−0·1742***	−0·1758***	−0·1751***
	(−21·5388)	(−21·7044)	(−21·6178)	(−21·5414)	(−21·7811)	(−21·6534)
Lev	−0·4509***	−0·4530***	−0·4615***	−0·4515***	−0·4641***	−0·4519***
	(−18·3876)	(−18·4839)	(−18·8233)	(−18·4179)	(−18·9159)	(−18·4221)
Capex	−0·4303***	−0·4313***	−0·4287***	−0·4334***	−0·4331***	−0·4308***
	(−6·7975)	(−6·8108)	(−6·7771)	(−6·8425)	(−6·8458)	(−6·8011)
IndVol	0·0847***	0·0790***	0·0583***	0·0771***	0·0593***	0·0792***
	(4·9365)	(4·6115)	(3·3743)	(4·5009)	(3·4371)	(4·6204)
Div	−0·0684	−0·0687	−0·0671	−0·0665	−0·0691	−0·0672
	(−1·0737)	(−1·0777)	(−1·0546)	(−1·0434)	(−1·0861)	(−1·0557)
Fixed Effects	Firm	Firm	Firm	Firm	Firm	Firm
	Year	Year	Year	Year	Year	Year
Observations	45,848	45,848	45,848	45,848	45,848	45,848
R^2	0.0675	0.0675	0.2620	0.0675	0.0688	0.0674

social interactions". All the six measures are continuous variables with higher values indicating better governance standards. The advantage of using these governance variables is they vary with time, which allows for better examination of effects from variations in country-political characteristics. This approach supersedes using indicator variables for legal origin (common law vs. civil law) and political systems (parliamentary vs. presidential) as these remain static.

The explanatory variable of interest is the interaction term $Incident \times PolGov$, which has a negative coefficient for each of the six measures of governance. The evidence is consistent with the prediction that better political governance can mitigate uncertainty caused by non-electoral incidents, and consequently firms respond by increasing their precautionary cash balances less. The mean of the coefficients on the interaction term shows that cash holdings is 4.2% lower for firms in countries with higher quality governments given political uncertainty. It is also interesting to note that some coefficients of the variable *PolGov* are negative and significant. This implies that absent political uncertainty, firms in countries with governments that are more effective, have higher regulatory quality, and follow the rule of law tend to hold less cash. The key implications of the evidence presented thus far are (1) politics does effect changes to economic outcomes through the channel of uncertainty, and (2) the "strength" of the uncertainty channel is not consistent across countries and time; it depends significantly on the state of political governance within countries.

4.5.2.2 Spillover Effects

In the next set of cross-country analysis, I explore whether political uncertainty from non-electoral incidents in a particular country affects precautionary cash holdings of firms in a neighboring country. Countries in East Asia are characterized by

close political and economic links. For instance, the Association of Southeast Asian Nations (ASEAN), which includes Indonesia, Malaysia, Philippines, and Thailand, is an active multi-government body that facilitates diplomatic resolution of political issues and economic integration among its member states. The significant volume of trade between East Asian countries[13] is further evidence of the important economic inter-dependency in this region. Therefore, it is reasonable to expect firm managers to be concerned about political uncertainty from a neighboring country because it may lead to a breakdown of regional economic cooperation thereby increasing illiquidity risk.

To proxy for political uncertainty from a neighboring country, I construct an indicator variable *Spillover*, which takes a value of 1 if the closest neighboring country measured by geographical distance experiences a non-electoral political incident in year t, and 0 otherwise. I identify the closest neighbor (in parenthesis) for each country in the sample as follows: Hong Kong (Taiwan); Indonesia (Malaysia); Malaysia (Thailand); Philippines (Hong Kong); Taiwan (Hong Kong); and Thailand (Malaysia). I then include *Spillover* in the baseline model specification to examine its effect.

Table 4.5 shows the results. In columns (1) to (3), I exclude firm-specific controls to show the effects solely from the political indicator variables *Spillover*, *Incident*, and *Election*. And in columns (4) to (6), control variables are included in the regressions. All tests include firm and year fixed effects. The coefficients on *Spillover* are positive and significant in all tests even when political uncertainty from domestic non-electoral incidents and national elections are included as additional controls.

[13]For example, 28.1% and 28.9% of Malaysia's and Thailand's total exports, respectively, are to other ASEAN states. (*Source: ASEAN External Trade Statistics*)

Table 4.5: Spillover Effects of Political Uncertainty

The table reports estimation results from regressions examining the spillover effects of political uncertainty from non-electoral incidents on cash holdings. The dependent variable is the natural log of cash and cash equivalents scaled by book value of total assets. A "spillover" occurs when a non-electoral political incident occurs in the nearest neighboring country by geographical distance. Thus, $Spillover_t$ is an indicator variable taking a value of 1 if $Incident_t = 1$ in the nearest neighboring country, and 0 otherwise. Cash flow (*CF*), investment rates (*Capex*), industry cash flow volatility (*IndVol*), and cash dividends (*Div*) are measured contemporaneously, while Tobin's Q (*Q*), firm size (*Size*), leverage (*Lev*) are lagged by one year. See the Appendix for details of variable definitions. All specifications include firm and year fixed effects. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. Coefficients marked with ***, **, and * are statistically significant at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Spillover}_\text{t}$	0·0391***	0·0324***	0·0336***	0·0301***	0·0224***	0·0235***
	(3·7403)	(3·1567)	(3·2626)	(3·6413)	(2·6692)	(2·8065)
Incident_t		0·0437***	0·0413***		0·0499***	0·0477***
		(3·9307)	(3·6862)		(5·7627)	(5·4956)
Election_t			−0·0346***			−0·0307***
			(−4·6538)			(−3·5596)
Q				0·1203***	0·1214***	0·1192***
				(6·4239)	(6·4809)	(6·3613)
CF				0·8708***	0·8754***	0·8740***
				(25·0460)	(25·1808)	(25·1422)
Size				−0·0128*	−0·0115*	−0·0128*
				(−1·8807)	(−1·6956)	(−1·8896)
Lev				−0·6065***	−0·6054***	−0·6047***
				(−24·5873)	(−24·5513)	(−24·5271)
Capex				−0·6700***	−0·6685***	−0·6632***
				(−10·9173)	(−10·8967)	(−10·8076)
IndVol				0·1647***	0·1680***	0·1691***
				(9·6237)	(9·8129)	(9·8784)
Div				−0·0547	−0·0538	−0·0554
				(−0·8205)	(−0·8075)	(−0·8311)
Fixed Effects	Firm	Firm	Firm	Firm	Firm	Firm
	Year	Year	Year	Year	Year	Year
Observations	47,930	47,930	47,930	47,930	47,930	47,930
R^2	0.0005	0.0011	0.0014	0.0345	0.0352	0.0355

This shows that firm managers also consider political uncertainty from neighboring countries to heighten the risk of illiquidity, and they take precautionary steps against this risk by increasing cash balances. But, note that the magnitude of the coefficients on *Spillover* are smaller than that on *Incident* implying that firm cash holdings increase less in response to political incidents occurring overseas compared to incidents occurring locally. This result makes sense because political uncertainty from foreign nations should have less bearing on the prospect of domestic government turnover and associated economic policy changes than uncertainty originating locally. Now undoubtedly, there will be some correlation between the occurrence of political incidents at home and those abroad. For instance, it is generally believed that the *Umbrella Movement* of 2014 in Hong Kong partially inspired the pro-democracy rallies in Taiwan also occurring in 2014. The Pearson correlation coefficient between *Spillover* and *Incident* is 0.084 significant at the 1% level. Unfortunately, without a strong prior it is difficult to ascertain whether this correlation level is too high. Hence, I rely on the general principle that correlations less than or equal to 10% is sufficiently low, and thus allow for separate interpretations of *Spillover* and *Incident* without causing severe econometric concerns.

4.5.3 Robustness and Additional Tests

4.5.3.1 Reduced-Form Model

According to the static tradeoff theory, firms target an optimal capital structure by adjusting debt levels, cash holdings, and capital expenditures simultaneously. The theory suggests that the relationships between cash holdings and leverage, and cash holdings and investments are endogenous. Opler et al. (1999) find strong evidence

that cash holdings in U.S. firms can be explained by the static tradeoff theory, which raises the concern about including the variables *Leverage*, *Capex*, and *Div* in the baseline model. To mitigate this concern, I perform regressions on a reduced-form of Equation (4.4) by omitting the endogenous variables.

Columns (1) and (2) of Table 4.6 show the results. Consistent with the baseline results, the explanatory variable of interest, *Incident* continues to have positive and significant coefficients. Also note that the coefficients on *Q*, *Cash Flow*, *Size*, and *IndVol* retain the same signs and have very similar magnitudes as the coefficients on these variables in the baseline results shown in Table 4.2. The results here suggest that endogeneity concerns in relation to the control variables in the baseline specification are unwarranted.

4.5.3.2 Macroeconomic Variations

Another concern deals with omitted explicit controls for macroeconomic factors that have been shown to also perturb the normal pattern of cash management policies.[14] For example, Baum, Caglayan, Ozkan, and Talavera (2006) find that the cross-sectional variation in cash levels for a sample of non-financial U.S. firms decline when measures of macroeconomic uncertainty increase. And, Almeida, Campello, and Weisbach (2004) find that the sign of the relationship between the sensitivity of cash holdings to cash flows and macroeconomic shocks depends on the constraint status of the firm. Consistently, change in GDP is shown to be a significant determinant of firm decision-making because it indicates the general prospect of a particular economy, which helps managers formulate firm policies. In the context of cash management,

[14]Many studies simply control for macroeconomic variations on cash holdings with time fixed effects in empirical models (see for example, Bigelli & Sánchez-Vidal, 2012; Pinkowitz & Williamson, 2001)

one should expect firms to hold less cash during periods of high GDP growth since positive economic growth entails higher capital flows, which lowers liquidity risk. Hence, managers should hold less precautionary cash with positive GDP growth.

I construct the variable *GDP Growth* as the annual percentage change in a country's current GDP in U.S. dollars to proxy for the economic state of a country and include it as a macroeconomic control variable in all subsequent tests in this section. I obtain GDP data from the World Development Indicators database from The World Bank, supplemented by data from the Asian Development Bank, and Thomson Reuters Worldscope database. I then reestimate Equation (4.4) with the one year lag of *GDP Growth*. The results are shown in columns (3) and (4) of Table 4.6. The coefficients on *Incident* remain positive and significant at the 1% level with no appreciable difference in magnitudes to the ones from the baseline results. This indicates that the effect of political uncertainty from non-electoral incidents on cash holdings is robust to controlling for economic conditions. And, as expected, the coefficients on *GDP Growth* have negative signs, which implies that positive GDP growth is associated with lower precautionary cash balances.

4.5.3.3 Alternative Variable Construction

I explore alternative constructions of the dependent variable, cash holdings, and test them in the baseline model. First, there could be a concern regarding variations in accounting practices across countries, which lead to different methods of recording book value of assets. Flower and Ebbers (2002) explain this issue as arising from differences in accounting conservatism, which is the level of strictness applied when it comes to recognizing assets and liabilities. This implies that the cash to book assets ratio across countries may not be a standardized measure of cash holdings. Sales

figures, on the other hand, are less subject to accounting conservatism than assets. Therefore, using sales as a deflator of cash balances might be a more consistent measure across countries. I then take the natural log of cash over sales and use this as the dependent variable in Equation (4.4) and rerun the regressions.

Columns (5) and (6) of Table 4.6 report the results. The coefficients on *Incident* are still positive, albeit smaller in magnitudes and have lower significance levels compared to the ones in Table 4.2. Notwithstanding, the overall interpretation does not change; firms increase their cash balances in response to political uncertainty from non-electoral incidents. It is interesting to note however, that the coefficient on *Election* is significant, which is not the case in any of the baseline results. But, the coefficient is negative indicating a reduction in cash holdings during elections. This appears to suggest that elections could in fact be a resolution of political uncertainty, not a contributor, and therefore should not be used solely in empirical studies examining the effects of political uncertainty on firm outcomes. As a further robustness check, instead of taking the log of cash over assets, I simply use the cash over assets ratio as the dependent variable. The results in columns (7) and (8) of Table 4.6 do not change previous conclusions.

Table 4.6: Robustness

The table reports estimation results from several robustness tests. *GDP Growth* is included as a macroeconomic control variable, computed as the annual percentage change in current GDP in USD for each country and lagged by one year in the tests. Columns (1) to (4) report results from regressions where the dependent variable is the natural log of cash and cash equivalents scaled by book value of total assets. The dependent variable *Log Cash/Sales* is the natural log of cash and cash equivalents scaled by sales. The dependent variable *Cash Holdings Level* is cash and cash equivalents scaled by book value of total assets. Cash flow (*CF*), investment rates (*Capex*), industry cash flow volatility (*IndVol*), and cash dividends (*Div*) are measured contemporaneously, while Tobin's Q (*Q*), firm size (*Size*), leverage (*Lev*) are lagged by one year. See the Appendix for details of variable definitions. All specifications include firm and year fixed effects. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. Coefficients marked with ***, **, and * are statistically significant at the 1%, 5%, and 10% level, respectively.

	Reduced-Form Model		Baseline with Econ. Var.		Log Cash/Sales		Cash Holdings Level	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Incident_{t}	0·0518***	0·0521***	0·0514***	0·0507***	0·0167*	0·0174*	0·0020**	0·0018*
	(5·4938)	(5·4850)	(5·4797)	(5·3665)	(1·7450)	(1·8193)	(2·0126)	(1·7692)
Election_{t}		0·0023		−0·0077		−0·0471***		−0·0036***
		(0·2188)		(−0·7137)		(−4·8944)		(−3·6525)
Q	0·0762***	0·0762***	0·0736***	0·0735***	0·2110***	0·1888***	0·0171***	0·0168***
	(3·9765)	(3·9749)	(3·8310)	(3·8299)	(9·8570)	(8·8309)	(7·8950)	(7·7813)
CF	0·8588***	0·8589***	0·8439***	0·8437***	0·1044***	−0·1449***	0·0623***	0·0622***
	(25·3147)	(25·3154)	(24·5227)	(24·5161)	(2·6563)	(−3·5396)	(15·5124)	(15·4742)
Size	−0·1660***	−0·1660***	−0·1693***	−0·1693***	−0·0646***	−0·0666***	−0·0128***	−0·0129***
	(−20·9566)	(−20·9509)	(−21·2803)	(−21·2847)	(−8·4871)	(−8·7743)	(−16·3443)	(−16·5138)
Lev			−0·5011***	−0·5013***	−0·5647***	−0·7302***	−0·0645***	−0·0644***
			(−20·3335)	(−20·3380)	(−20·1680)	(−25·3520)	(−22·5420)	(−22·5199)

(continued)

Table 4.6—*Continued*

	Reduced-Form Model		Baseline with Econ. Var.		Log Cash/Sales		Cash Holdings Level	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capex			−0·4631***	−0·4628***	−0·2533***	−0·0590	−0·1448***	−0·1442***
			(−7·5585)	(−7·5534)	(−3·6614)	(−0·8578)	(−20·3774)	(−20·2828)
IndVol	0·0654***	0·0652***	0·0796***	0·0800***	0·2273***	0·2225***	0·0199***	0·0201***
	(3·7606)	(3·7505)	(4·5912)	(4·6111)	(11·8206)	(11·6079)	(10·0745)	(10·1465)
Div			−0·0727	−0·0730	−0·0799	−0·0844	−0·0102	−0·0104
			(−1·1099)	(−1·1138)	(−1·0760)	(−1·1402)	(−1·3277)	(−1·3527)
GDP Growth			−0·2978***	−0·3086***	−0·3856***	−0·3803***	−0·0085	−0·0085
			(−4·1457)	(−4·2036)	(−8·1231)	(−8·0517)	(−1·5547)	(−1·5668)
Fixed Effects	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm
	Year	Year	Year	Year	Year	Year	Year	Year
Observations	48,127	48,127	47,928	47,928	47,560	47,560	47,938	47,938
R^2	0.0576	0.0576	0.0682	0.0682	0.0173	0.0233	0.0355	0.0358

4.5.3.4 Corporate Governance and Cash Holdings

I investigate an additional explanation of cash holdings, which stems from the agency cost motive. Jensen (1986) theorize that in an agency relationship, managers may implement policies that benefit only themselves at the expense of shareholders, which implies that managers have the incentive to hold more cash than optimal for maximizing shareholder wealth because the excess cash increases managerial discretion. Thus, the theory predicts that firms will hold more cash where agency problems are more pronounced. This is supported by empirical evidence from Kalcheva and Lins (2007) who show that weak shareholder protection is associated with higher cash holdings, which leads to lower firm values. Also, Dittmar and Mahrt-Smith (2007) show that firm value is reduced when poorly-governed firms hold too much cash.

To explicitly account for variations in corporate governance across countries, I follow Dittmar, Mahrt-Smith, and Servaes (2003) and use shareholder protection as a proxy for country-level corporate governance and include it in the baseline model. La Porta, Lopez-De-Silanes, Shleifer, and Vishny (1998) (henceforth, LLSV (1998)) measure the strength of shareholder protection as the number of antidirector rights, out of six categories, available to minority shareholders to protect them against exploitation by large shareholders. From Table 2 of LLSV (1998), the number of antidirector rights, in parenthesis, for the countries in this study are as follows: Hong Kong (5); Indonesia (2); Malaysia (4); Philippines (3); Taiwan (3); and Thailand (2). As in Dittmar et al. (2003), I employ a random effects framework to allow for variations in industry effects within a country as well as variations in country effects. In other words, the random effects are for each country–industry pair. Columns

(1) and (2) of Table 4.7 report the estimation results without firm-specific control variables while columns (3) and (4) report results with the controls. Two key findings emerge. First, the evidence suggests that corporate governance has significant effects on cash holdings. The negative coefficients on the level of shareholder rights imply that in countries where agency problems are less severe, firms tend to have lower cash balances. Second, even after accounting for corporate governance, political uncertainty continues to be a significant determinant of cash holdings; firm managers increase cash when non-electoral incidents occur. An implication of the results here is while the agency cost motive is significant, one cannot ignore the precautionary motive in response to political uncertainty as also an important explanation for corporate cash holdings.

4.5.3.5 Politically-sensitive Industries

In the final additional test, I examine variations in cash policy response to political uncertainty across firms within a country. To conduct this examination, I exploit variations in industry sensitivity to policy swings. According to Herron, Lavin, Cram, and Silver (1999), industries in the U.S. react differently to presidential election outcomes due to expected government partisanship. This implies that uncertainty over government turnover may have differential impacts on firm cash policy across industries because the operations, and ultimately performances of certain industries are more dependent on the political and economic objectives of the government than others, which could change when the administration changes. It follows that firms in politically-sensitive industries are likely to increase precautionary cash balances more so than others whenever there is political uncertainty.

Herron et al. (1999) identify 15 industry sectors whose stock performances are significantly dependent on which candidate wins the 1992 U.S. presidential elections, and suggest that these sectors are politically-sensitive. Obviously, one cannot expect all other countries to have the same set of politically-sensitive industries as in the U.S. But, since there is an absence of a clear theory to identify sensitive industries, I am left with the option to use the same industries from Herron et al., which include sectors such as petroleum and natural gas, telecommunications, tobacco products, etc. and code them as politically-sensitive for the countries in this study.

I introduce a dummy variable *Sensitive*, which takes on a value of 1 if the firm operates in a politically-sensitive industry, and 0 otherwise. I then interact *Sensitive* with *Incident* and *Election* to test the differential effects on cash holdings across firms when there is political uncertainty. The general model specification is as follows:

$$Cash_{ijk,t} = \beta_0 + \beta_1 Uncertainty_{j,t} \times Sensitive_k + \beta_2 Uncertainty_{j,t} + \beta_3 Sensitive_k + \beta_4 \mathbf{X}_{ijk,t} + \beta_5 \mathbf{Z}_{ijk,t-1} + \beta_6 GDP\_Growth_{j,t-1} + \gamma_j + \tau_t + \varepsilon_{ijk,t}, \quad (4.5)$$

where i indexes firm, j indexes country, k indexes industry, and t indexes year. $Uncertainty_{j,t}$ is either $Incident_{j,t}$ or $Election_{j,t}$ in separate regressions. $\mathbf{X}$ is a vector of firm-specific variables measured at time t. $\mathbf{Z}$ is a vector of firm-specific variables measured at time $t-1$. γ_j, τ_t, and $\varepsilon_{ijk,t}$ denote country fixed effects, year fixed effects, and residuals, respectively.

Table 4.7: Additional Tests

The table reports estimation results from several additional tests. The dependent variable in all tests is the natural log of cash and cash equivalents scaled by book value of total assets. Columns (1) to (4) report results from regressions examining the effects of country-level corporate governance and political uncertainty on cash holdings. The proxy for country-level corporate governance is the shareholder rights (*Shr. Rights*) measure from LLSV (1998). Following Dittmar et al. (2003), random effects for each country-industry pair are used in these regressions. Columns (5) to (8) report results from regressions examining the interactive effect of political uncertainty and politically-sensitive industries (*Sensitive*) on cash holdings. Industries that are politically-sensitive are defined based on the findings in Herron et al. (1999). *Sensitive* is an indicator variable taking a value of 1 if a firm operates in a politically-sensitive industry, and 0 otherwise. Country and year fixed effects are used in these regressions. All regressions include control variables *CF*, *Capex*, *IndVol*, *Div*, *Q*, *Size*, *Lev*, and *GDP Growth*. See the Appendix for details of variable definitions. *t*-statistics are reported in parentheses. Coefficients marked with ***, **, and * are statistically significant at the 1%, 5%, and 10% level, respectively.

	Shareholder Rights				Sensitive Industries			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Incident_t	0·0522***	0·0498***	0·0580***	0·0559***	0·0766***		0·0795***	
	(6·0328)	(5·7503)	(6·7901)	(6·5352)	(5·5151)		(6·0234)	
Election_t		−0·0360***		−0·0315***		−0·0038		−0·0233
		(−4·1210)		(−3·6469)		(−0·2351)		(−1·5040)
Shr. Rights (level)	−0·4996***	−0·5018***	−0·5072***	−0·5119***				
	(−10·4513)	(−10·5246)	(−10·8963)	(−11·0027)				
Sensitive					0·2298***	0·2024***	0·2634***	0·2349***
					(9·3109)	(8·4771)	(11·1158)	(10·2276)
$\text{Incident}_t \times$					0·2067***		0·2255***	
Sensitive					(6·0022)		(6·8683)	
$\text{Election}_t \times$						0·1785***		0·1770***
Sensitive						(4·8097)		(4·9883)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Random Effects	Country × Industry	Country × Industry	Country × Industry	Country × Industry				
Fixed Effects					Country Year	Country Year	Country Year	Country Year
Observations	47,928	47,928	47,928	47,928	47,928	47,928	47,928	47,928
R^2					0.1365	0.1360	0.2257	0.2251

The estimation results of Equation (4.5) are shown in columns (5) to (8) of Table 4.7. The positive coefficients on *Sensitive* show that firms in industries that are politically-sensitive tend to hold between 20.2% to 26.3%, depending on the specification, more cash than other firms. Also, the positive coefficients on the interaction terms $Incident \times Sensitive$ and $Election \times Sensitive$ support the prediction that when there is political uncertainty, either from non-electoral incidents or national elections, firms in sensitive industries increase their cash holdings even more. The evidence suggests that variations in cash management response to political uncertainty can in part be explained by variations in industry sensitivity to government turnover.

4.5.4 Security Issuances

To show that the increase in cash holdings during periods of non-electoral political uncertainty is very unlikely a consequence of increased external financing, I investigate how the issuance of debt and equity securities are affected. This line of inquiry aims to substantiate the central hypothesis of this study that managers conscientiously boost cash holdings on a precautionary basis in response to political uncertainty, and that the increase in cash is not a simple mechanical outcome of capital-raising activity.

Besides firm-level factors, the ability to raise external capital is also dependent on the legal and political framework, and financial development of a country (La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997). Yet, political uncertainty can significantly impair polity and the financial sector (Qi, Roth, & Wald, 2010; Roe & Siegel, 2011), which engenders an impediment to external capital raising. Hence,

controlling for firm characteristics, one would expect firms to raise less external capital during periods of political uncertainty.

To test this conjecture, I regress net debt and net equity issuances (in separate regressions) on *Incident* and *Election* with contemporaneous *Cash Flow*, and the one-year lag of Tobin's *Q*, firm *Size*, and *Lev*. The firm-specific control variables included in the regressions follow the general specification from Almeida and Campello (2010). The dependent variable *Debt Issuance* is constructed as the difference between long term debt borrowings and reduction in long term debt scaled by book assets. The dependent variable *Equity Issuance* is the ratio of net proceeds from the sale of common and preferred stock to book assets. I obtain the data from Thomson Reuters Worldscope database.

Table 4.8 reports the results. The negative and statistically significant coefficients on *Incident* shows that both debt and equity security issuances decrease during non-electoral political incidents. *Election* on the other hand, show no significant effect on external capital raising. The evidence demonstrates that non-electoral political uncertainty very likely disrupted normal capital flows of economies such that it becomes more difficult for firms to issue securities relative to periods without political uncertainty. It is also likely that security issuances are lower during periods of political uncertainty because firms make fewer investments, and therefore require less external capital. I explore this in the next subsection.

4.5.5 Investment Rates

Several theoretical models show that political uncertainty exerts significant influence over investment decisions in that uncertainty raises the firm's expected returns on

Table 4.8: Security Issuances

The table reports estimation results from regressions examining the effect of political uncertainty on the issuance of debt and equity securities. Columns (1) to (3) report results from regressions where the dependent variable *Debt Issuance* is the net long term debt borrowings scaled by book value of total assets. Columns (4) to (6) report results from regressions where the dependent variable *Equity Issuance* is the net proceeds from the sale of common and preferred stock scaled by book value of total assets. The firm-specific control variables are cash flow (*CF*), Tobin's Q (*Q*), firm size (*Size*), and leverage (*Lev*). Only *CF* is measured contemporaneously, while the other control variables are lagged by one year. See the Appendix for details of variable definitions. All specifications include firm and year fixed effects. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. Coefficients marked with ***, **, and * are statistically significant at the 1%, 5%, and 10% level, respectively.

	Debt Issuance			Equity Issuance		
	(1)	(2)	(3)	(4)	(5)	(6)
Incident_{t}	−0·0022***		−0·0027***	−0·0042***		−0·0044***
	(−2·6934)		(−3·3926)	(−5·3961)		(−5·6708)
Election_{t}		0·0002	−0·0001		−0·0002	−0·0008
		(0·2702)	(−0·0785)		(−0·2580)	(−0·9381)
CF	−0·0135***	−0·0134***	−0·0174***	−0·0246***	−0·0243***	−0·0247***
	(−4·6388)	(−4·5876)	(−6·0358)	(−8·7826)	(−8·6729)	(−8·8368)
Q	0·0297***	0·0296***	0·1079***	0·0068***	0·0065***	0·0290***
	(19·1034)	(19·0314)	(29·6063)	(4·2938)	(4·1219)	(7·8332)
Size	0·0098***	0·0097***	0·0123***	0·0258***	0·0256***	0·0269***
	(15·6506)	(15·4786)	(19·6902)	(39·8324)	(39·5163)	(41·5731)
Lev	−0·0617***	−0·0617***	−0·0659***	0·0306***	0·0307***	0·0289***
	(−29·6686)	(−29·6504)	(−31·9123)	(15·2187)	(15·2363)	(14·2581)
Fixed Effects	Firm Year	Firm Year	Firm Year	Firm Year	Firm Year	Firm Year
Observations	43,546	43,546	43,546	47,681	47,681	47,681
R^2	0.0526	0.0524	0.0646	0.0553	0.0546	0.0562

projects such that the opportunity set becomes smaller, and consequently fewer investments are made (Pindyck & Solimano, 1993; Rodrik, 1991). Julio and Yook (2012) provide a preponderance of empirical evidence proving that firms reduce investments during national elections. However, as noted earlier in the paper, elections may not be a good proxy for political uncertainty because (1) outcomes could be consistent and do not cause government turnovers, (2) elections can actually be resolutions to uncertainty in some cases, and (3) the majority of elections occur in predictable cycles, which weakens exogeneity conditions in econometric models. Therefore, the key dataset of non-electoral incidents leading to political uncertainty developed in this study is a better identification of political uncertainty, and can provide us with a clearer understanding of investment behavior under uncertainty.

I employ the investment-Q model from Hayashi (1982) to test the effect of political uncertainty on investments. *Invest* is defined as capital expenditures scaled by beginning-of-period book assets. The general model specification is

$$Invest_{ij,t} = \beta_0 + \beta_1 Incident_{j,t} + \beta_2 Q_{ij,t-1} + \beta_3 CF_{ij,t} + \eta_i + \tau_t + \varepsilon_{ij,t}, \qquad (4.6)$$

where i indexes firm, j indexes country, and t indexes time. All variables are as previously defined. In alternate specifications, I include *Election*, firm *Size*, *Lev*, and *GDP Growth* as additional control variables.

Panels A and B of Table 4.9 show the descriptive statistics of investment rates during incident and non-incident years, and during election and non-election years, respectively. The unconditional mean investment rate during years when non-electoral political incidents occur is 0.0019 lower than in non-incident years, which represents a 3% decline, statistically significant at the 1% level. Notice also, that the median

Table 4.9: Comparison of Investment Rates

Panel A reports descriptive statistics for investment rates in years when non-electoral political incidents occur and compares it to the investment rates in years when no incidents occur. Panel B reports descriptive statistics for investment rates in years when national elections occur and compares it to the investment rates in years when no elections occur. Investment rate is defined as capital expenditures scaled by beginning-of-period book value of total assets.

Panel A: Investment Rates in Incident Years vs. Non-Incident Years			
	Mean	Median	Std. Dev.
Incident Years	0·0617	0·0311	0·0872
Non-Incident Years	0·0636	0·0319	0·0888
Difference	−0·0019		
t-stat	−2·4983		
Panel B: Investment Rates in Election Years vs. Non-Election Years			
Election Years	0·0666	0·0333	0·0920
Non-Election Years	0·0615	0·0309	0·0867
Difference	0·0051		
t-stat	6·4536		

investment rate during incident years is lower than that in non-incident years. When comparing the investment rates between election years and non-election years, Panel B of Table 4.9 show that the mean and median investment rates are actually *higher* during years when elections are held. And, the difference in unconditional means is significant at the 1% level.

Next, I perform regression analysis with variations of Equation (4.6). The univariate results in columns (1) and (2) of Table 4.10 show a negative and significant coefficient on *Incident*, and a positive but not significant coefficient on *Election*, respectively. In columns (3) to (6) I include various firm-specific controls, and consistently, the results show that investments decline during non-electoral incidents. But, no conclusive results can be said for the effect of national elections on investment rates. In columns (7) and (8) of Table 4.10, both *Incident* and *Election* are included in the same regressions. And, the results support earlier findings that firms cut investments in response to political uncertainty only from non-electoral incidents,

but not from elections. Yet again, the evidence suggests that national elections do not appear to induce significant political uncertainty when more exogenous and pertinent sources of uncertainty from non-electoral incidents are considered.

Additionally, results from the full specification model in column (8) of Table 4.10 shows investment rates decline by 0.0013 on average in the year where non-electoral political incidents occur, which translates to a 2.0% drop in investment rates compared to the investment rate in an average year without incidents occurring. Now, revisiting column (9) of Table 4.2, the full specification model shows a 5.2% increase in actual cash levels on average in the year where non-electoral incidents occur relative to the cash levels in an average year without incidents occurring. Clearly, the increase in average cash levels in years with political incidents occurring cannot be completely attributed to a cut in investment rates. And, recall that results from Table 4.8 show a drop in security issuances, which shows that the increase in cash levels cannot be explained by external financing. Therefore, the additional 3.2% increase in cash levels in an average year where non-electoral political incidents occur strongly supports the notion that managers are taking a precautionary stance by building up cash contingencies to guard against political uncertainty.

Table 4.10: Investment Rates

The table reports estimation results from regressions examining the effect of political uncertainty on investment rates. The dependent variable is investment rate computed as capital expenditures scaled by beginning-of-period book value of total assets. The firm-specific control variables included are cash flow (*CF*), Tobin's Q (*Q*), firm size (*Size*), and leverage (*Lev*). The country-level macroeconomic control variable is the annual percentage change in current GDP in USD (*GDP Growth*). Only *CF* is measured contemporaneously, while the other control variables are lagged by one year. See the Appendix for details of variable definitions. All specifications include firm and year fixed effects. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. Coefficients marked with ***, **, and * are statistically significant at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Incident_{t}	−0·0022***		−0·0018**		−0·0015**		−0·0017**	−0·0013*
	(−2·6545)		(−2·2807)		(−2·0011)		(−2·1525)	(−1·8195)
Election_{t}		0·0008		0·0011		0·0014*	0·0008	0·0013
		(0·7675)		(1·0520)		(1·7094)	(0·8265)	(1·4927)
CF			0·1176***	0·1177***	0·0827***	0·0829***	0·1176***	0·0828***
			(31·1313)	(31·1817)	(31·1636)	(31·2181)	(31·1445)	(31·1728)
Q			0·0136***	0·0134***	0·0084***	0·0083***	0·0135***	0·0084***
			(7·4309)	(7·3171)	(5·6281)	(5·5753)	(7·3888)	(5·6312)
Size					−0·0346***	−0·0345***		−0·0346***
					(−18·0756)	(−18·0577)		(−18·0655)
Lev					0·0147***	0·0146***		0·0146***
					(23·8206)	(23·7364)		(23·8063)
GDP Growth					0·0298***	0·0318***		0·0316***
					(5·3285)	(5·5624)		(5·5225)
Fixed Effects	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm
	Year	Year	Year	Year	Year	Year	Year	Year
Observations	60,588	60,588	47,973	47,973	47,967	47,967	47,973	47,967
R^2	0.0319	0.0318	0.0906	0.0905	0.1023	0.1023	0.0906	0.1023

4.6 Conclusion

This paper contributes to the political economics and corporate finance literatures by providing comprehensive evidence that political uncertainty causes managers to increase cash holdings as a precautionary measure. However, unlike many extant studies (see for example, Boutchkova et al., 2012; Durnev, 2010; Julio & Yook, 2012; Mei & Guo, 2004; Pantzalis et al., 2000), this paper uses political incidents of a non-electoral nature instead of national elections as a proxy for political uncertainty. Because non-electoral incidents occur more randomly and with less predictable outcomes than elections (of which the majority are called in regular cycles as required by constitutional law, while the rest tend to coincide with economic performance), the incidents provide true exogenous shocks to examine the effects of political uncertainty on cash management policies, and allows causal inferences to be made from the findings of this paper.

The results show that firms increase cash levels by 5.2% on average in response to political uncertainty only from non-electoral incidents, but there are no statistically significant changes to cash during elections. The results are robust to alternative empirical specifications and variable constructions, including GDP growth as a control for macroeconomic states, controlling for country-level corporate governance measured by shareholder protection levels, and adding a dummy variable for politically-sensitive industries to account for variations in inherent industry reactions to political uncertainty. Moreover, I find evidence that managers remain cautious after the first occurrence of non-electoral incidents and continue to increase cash holdings, albeit with a step-down as the uncertainty subsides. Across countries, firms operating in countries with poorer political governance standards on average

increase cash holdings by 4.2% more than firms in countries with higher quality political and legal institutions in response to political uncertainty. I also find that political uncertainty from non-electoral incidents occurring in a particular country can spillover to neighboring countries and cause managers to respond accordingly. Finally, an investigation of security issuances and investment rates when non-electoral incidents occur show that less external funds are raised, and cash levels increase more so than cuts to investments. The findings provide strong support for the precautionary motive for holding cash as caused by political uncertainty, and that cash management decisions are made with care and not as a by-product of other corporate finance decisions.

The key implications for this paper are as follows. First, uncertainty from politics influence cash management policy in that the occurrence of non-electoral political incidents raises overall risk of illiquidity and causes managers to increase cash contingencies as a precaution. Second, national elections are a poor identification of political uncertainty. Studies examining causal effects of political uncertainty on firm outcomes should consider using clear exogenous shocks of a political nature such as non-electoral political incidents.

4.7 Appendix: Variable Descriptions

Variable	Description
Panel A: Country-Level Variables	
Political Incident (*Incident*)	Indicator variable that takes a value of 1 if a non-electoral political incident occurs in year t, and 0 otherwise.
National Election (*Election*)	Indicator variable that takes a value of 1 if a national election occurs in year t, and 0 otherwise.
Spillover Political Incident (*Spillover*)	Indicator variable that takes a value of 1 if a non-electoral political incident occurs in the closest neighboring country by geographical distance in year t, and 0 otherwise.
Voice and Accountability (VA)	Continuous variable from -2.5 to 2.5 indicating ability of citizens to select their government, and overall freedom of expression. This data is obtained from Kaufmann et al. (2010).
Political Stability and Absence of Violence/Terrorism (PV)	Continuous variable from -2.5 to 2.5 indicating perceptions on the probability of government turnover or destabilization via illegal means such as a coup *d'état*. This data is obtained from Kaufmann et al. (2010).
Government Effectiveness (GE)	Continuous variable from -2.5 to 2.5 indicating perceptions on the quality of public sector services and government policies, and ability of governments to withstand undue political pressures. This data is obtained from Kaufmann et al. (2010).
Regulatory Quality (RQ)	Continuous variable from -2.5 to 2.5 indicating perceptions on the ability of governments to administer policies that foster private sector development. This data is obtained from Kaufmann et al. (2010).
Rule of Law (RL)	Continuous variable from -2.5 to 2.5 indicating perceptions on the adherence to due process especially in terms of honoring contracts and the protection of property rights. This data is obtained from Kaufmann et al. (2010).
Control of Corruption (CC)	Continuous variable from -2.5 to 2.5 indicating perceptions on the prevention of public officials from abusing power to advance private interests. This data is obtained from Kaufmann et al. (2010).

(continued)

Appendix—*Continued*

Variable	Description
Shareholder Rights Level (*Shr. Rights*)	A discrete variable that takes an integer value from 0 to 6 indicating the number of antidirector rights available in a particular country's law to protect minority shareholders. This data is obtained from LLSV (1998).
GDP Growth	The annual percentage change in current gross domestic product (GDP) measured in U.S. dollars.
Panel B: Industry-Level Variables	
Industry Cash Flow Volatility (*IndVol*)	The standard deviation of two-digit SIC industry cash flows over the previous four years.
Politically-sensitive Industry (*Sensitive*)	A dummy variable that takes the value of 1 if the industry is politically-sensitive, and 0 otherwise. This data is obtained from Herron et al. (1999).
Panel C: Firm-Level Variables	
Cash Holdings (*Cash*)	The natural log of cash and cash equivalents scaled by book value of total assets.
Tobin's Q (Q)	The ratio of market value of assets to book value of assets. Market value of assets is the sum of book value of assets and market value of common equity less the sum of deferred taxes and book value of common equity.
Cash Flow (*CF*)	The sum of net income before extraordinary items and depreciation scaled by beginning-of-year book value of total assets.
Firm Size (*Size*)	The natural log of book value of total assets.
Leverage (*Lev*)	The ratio of book value of total debt to book value of total assets.
Investment Rate (*Capex*)	Capital expenditures scaled by beginning-of-year book value of total assets.
Cash Dividend (*Div*)	A dummy variable that takes the value of 1 if a firm pays cash dividends to common and preferred stock holders in year t, and 0 otherwise.

(continued)

Appendix—*Continued*

Variable	Description
Log Cash/Sales	The natural log of cash and cash equivalents scaled by sales.
Cash Holdings Level	Cash and cash equivalents scaled by book value of total assets.
Debt Issuance	The difference between long term debt borrowings and reduction in long term debt in year t scaled by book value of total assets.
Equity Issuance	The net proceeds from the sale of common and preferred stock in year t scaled by book value of total assets.

CHAPTER 5

CONCLUSION

The research in this thesis extends findings in conventional corporate finance literature covering investment and financing policies, cost of capital, and cash management. Chapter 2 takes a different approach to investigate the functioning of internal capital markets in that we use business group data consisting of independently-listed firms connected together via common ownership linkages to directly observe critical corporate finance decisions. This supersedes studies using multi-segment conglomerate data, which are prone to problems associated with unobservable segment-level financial data on capital flows and expenditures. We conjecture that the internal capital market is most critical at providing capital to support the investments of group member firms whenever there is an adverse shock to external capital supply. We use the 2008 GFC as an exogenous shock to test changes in dependence of a particular group-affiliated firm's investments to its own cash flows and the cash flows of other group member firms, and compare it to changes in dependence of a standalone firm's investments to its own cash flows. This line of inquiry allows us to answer three research questions; 1) how do internal capital markets alleviate external capital constraints; 2) what are the benefits of business group structures; and 3) how do firm-level investment policy respond during a financial crisis. Results from our difference-in-difference and instrumental variable tests show that group internal capital markets actively channel capital to firms most likely in need of capital to sustain investments. This explains why group-affiliated firms have higher investment rates than standalone firms despite facing the same external capital constraints due to the GFC. Thus, the business group structure provides a key financing advantage unavailable to standalone firms.

Chapter 3 addresses a key methodological inadequacy of extant textual analysis

techniques as applied to analyzing qualitative disclosures. Instead of using conventional keyword search methods, we develop an innovative grammatical Natural Language Processing technique, which is capable of capturing the contextual relationship among words in a sentence such that it greatly reduces interpretation errors. We apply our technique to study disclosures of expected funding sources as required by SEC Regulation S-K for all firms publicly-listed in the U.S. We hypothesize that if managers are truthful about funding disclosures, then one should observe that firms planning to rely on external capital to actually issue securities in the next period. We test this by regressing external capital raised on our measures of funding sources and find that the external fund source index is positively correlated to the amount of debt and equity capital raised. This shows that on average, the funding disclosures provide credible information about the firm's planned financing policy. Next, we study the implications of funding disclosures on the firm's investment activity, cost of capital, and firm risks. We find that firms that expect to raise more external capital have higher investment rates and R&D expenditures in the next period. Moreover, firms disclosing more funding sources benefit from lower costs of capital. However, this benefit pertains only to firms that are truthful about their funding disclosures because we find that firms that did not disclose their intention to raise external capital, yet proceed to do so in the next period experience higher cost of capital. Our study emphasizes the relevance of qualitative information to firm outcomes, and sets a methodological standard for context-based textual analysis.

Chapter 4 overcomes endogeneity concerns in studies using elections as proxy for political uncertainty by setting a natural experimental framework with non-electoral political incidents causing uncertainty and examining its effect on corporate cash

holdings. Non-electoral political incidents occur more randomly with harder to predict outcomes compared to national elections, which are usually called in predictable cycles or during favorable economic states. Thus, non-electoral political incidents act as strong exogenous shocks to firm economics. Based on the arguments of the precautionary motive for holding cash, we hypothesize that the occurrence of political uncertainty distorts the predictability of a particular firm's net cash disbursements. And consequently, prudent managers increase cash balances as a precaution. Results from the baseline univariate and multivariate regressions support the descriptive statistics showing that cash balances do indeed increase in response to political uncertainty from non-electoral incidents. Conversely, we do not find any statistically significant changes to cash balances during national elections. Next, we show that cash policy response to political uncertainty is not uniform across firms. Countries with better shareholder protection rights attenuate a firm's increase in cash holdings in response to political uncertainty. Also, firms operating in politically-sensitive industries increase cash holdings more when there is political uncertainty. The final set of results show that political uncertainty dampens security issuances and capital expenditures. Overall, this study documents detailed evidence that political uncertainty causes firms to increase cash holdings, and provides a direction for future research in this area by expounding the disadvantages of using national elections as proxy for political uncertainty.

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