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TWO ESSAYS ON CORPORATE FINANCE

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TWO ESSAYS ON CORPORATE FINANCE

by

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Dedication

I dedicate this dissertation to my parents and my sister. It is their love, encouragement, and support that helped me to finish the work herein.

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I would like to express my appreciation to all of the members on my dissertation committee. I am especially grateful to my dissertation chair, Robert Parrino, for his invaluable mentorship and support throughout my graduate education.

TWO ESSAYS ON CORPORATE FINANCE

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This dissertation consists of two essays on corporate finance. Essay one examines whether corporate governance affects firm performance after capital investments. I find that among firms with weak corporate governance, those with high abnormal capital investments have significantly lower stock performance than those with low abnormal capital investments. In addition, a significant portion of the difference in abnormal stock performance between the two subgroups occurs around earnings announcements.   In contrast, the level of abnormal capital investments is not related to subsequent stock performance or earnings announcement returns at firms with strong corporate governance. These findings indicate that corporate governance structure enhances firm value by mitigating the over-investment problem.

Essay two examines how insider trading activity prior to seasoned equity offerings (SEOs) is related to subsequent investment, operating, and financing decisions of the issuer. I find that SEO firms with more abnormal insider sales issue more seasoned equity, hold more cash and increase dividend payouts more. They also perform

more poorly. Following the SEO, these firms also issue less equity and the effects of the SEO on their capital structures gradually reverses. These findings suggest that SEO firms with more abnormal insider sales are more likely to have overpriced stock, while those with less abnormal insider sales are more likely to have good investment opportunities. Insider trading activity prior to the SEO provides valuable information about the firm's incentives to issue seasoned equity and help to predict the real activities of the issuer following the SEO.

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Chapter 1: Introduction

Conflicts of interest play an important role in corporate theory. I study two important conflicts of interest in this dissertation; conflicts between managers and shareholders as they affect investment decisions and conflicts between insiders and outside investors as they affect the timing of equity sales.

1. ESSAY ONE

Separation of ownership and control gives rise to agency problems between managers and shareholders. An effective corporate governance structure could enhance firm value by aligning managerial interests with shareholders' interests and by regulating managerial decisions.

In the first essay of the dissertation, I examine whether corporate governance affects firm performance after capital investments. I find that among firms with weak corporate governance, those with high abnormal capital investments have significantly lower stock performance than those with low abnormal capital investments; a significant portion of the difference in stock performance between the two subgroups occurs around earnings announcements. In contrast, the level of abnormal capital investments is not related to subsequent stock performance or earnings announcement returns for firms with strong corporate governance. On the other hand, among firms with a high level of abnormal capital investments, firms with weak corporate governance underperform firms with strong corporate governance; a significant portion of the difference in stock performance between the two subgroups occurs around earnings announcements. In contrast, strength of corporate governance is not related to subsequent stock performance or earnings announcement returns for firms with a low level of abnormal capital

investments. These findings indicate that corporate governance structure enhances firm value by mitigating the over-investment problem.

2. ESSAY TWO

Corporate insiders have superior information about the firm's value over outsiders. When they believe that the firm's shares are over-priced, they can take advantage of this inside information by issuing seasoned equity and selling their own shares.

In the second essay of the dissertation, I examine how insider trading activity prior to seasoned equity offerings (SEOs) is related to subsequent investment, operating, and financing decisions of the issuers. I find that SEO firms with more abnormal insider sales issue more seasoned equity. Such firms do not make more investments; rather, they hold the extra proceeds in cash balance and increase dividend payouts more. There also exists weak evidence that such firms tend to have worse operating performance and they issue less equity subsequently to reverse the effects of equity issuance on their capital structures. These findings suggest that insiders have superior information about the firm value and they use this information to time both personal trades and public equity offerings. Insider trading activity prior to SEOs provides valuable information about the firms' incentives to issue seasoned equities. In addition, insider information about the issuer's valuation not only influences the firm's decision to issue seasoned equity, but also has an impact on the firm's real activities following the SEO. Pre-issue Insider trading activity helps predict subsequent investment, operating, and financing decisions of the issuer.

The remainder of this dissertation is organized as follows. Chapter 2 presents the first essay on Corporate Governance and Firm Performance after Capital Investments;

Chapter 3 presents the second essay on Insider Trading and Investment, Operating, and Financing Decisions of SEO Firms. Each chapter contains sections on motivation, literature review, data description, empirical tests and findings, robustness checks, and conclusion.

Chapter 2: Corporate Governance and Firm Performance after Capital Investments

1. MOTIVATION

Corporate governance of U.S. firms has changed dramatically in the last a few decades. From the takeover and restructuring wave of the 1980s, to the rise of incentive compensation and institutional ownership throughout the 1990s, corporate governance seemed to play an important role in the development of U.S. corporations. However, with the failures of Enron, WorldCom, and many other prominent companies in recent years, both industry practitioners and academic researchers are challenged harder than ever to understand the effectiveness of corporate governance.

The corporate governance literature has examined the relation between corporate governance structure and firm valuation. For example, previous studies find evidence that board structure, board size, and managerial ownership are associated with firm valuations.[1] Recent studies of Gompers, Ishii, and Metrick (2003), Bebchuk, Cohen, and Ferrell (2009) and Cremers and Nair (2005) find that firms with fewer anti-takeover provisions are associated with higher firm values. Given the evidence on the relation between corporate governance and firm value, it is a natural question to ask *through what mechanism* a strong corporate governance structure creates value.

An effective corporate governance structure enhances firm value by aligning managerial interests with shareholders' interests and by regulating managerial decisions. Three main types of decisions are subject to managerial discretion: investment decisions, financing decisions, and operating decisions. While many studies have examined the role

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[1] See Weisbach (1988), Morck, Shleifer and Vishny (1988), and Yermack (1996), among others,

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of corporate governance through the second and third channels,[2] this essay investigates the first channel through which corporate governance impacts firm value - investment decisions. Specifically, this essay examines how a firm's corporate governance structure is related to its stock performance following capital investments.

I find that among firms with weak corporate governance, those with high abnormal capital investments significantly underperform those with low abnormal capital investments. The difference in abnormal stock performance is 4.2% in the year following the capital investments, which is both statistically and economically significant. In addition, a significant portion of the difference in stock performance between these two subgroups occurs around earnings announcements. In contrast, the level of abnormal capital investments is not related to subsequent stock performance or earnings announcement returns for firms with strong corporate governance.

On the other hand, among firms with a high level of abnormal capital investments, firms with weak corporate governance underperform firms with strong corporate governance. The difference in abnormal stock performance is 3.1% in the year following the capital investments, which is both statistically and economically significant. In addition, a significant portion of the difference in stock performance between these two subgroups occurs around earnings announcements. In contrast, strength of corporate governance is not related to subsequent stock performance or earnings announcement returns for firms with a low level of abnormal capital investments.

These findings provide evidence for the role of corporate governance structure in mitigating the overinvestment tendency of mangers and hence increasing firm value.

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[2] See Shleifer and Vishny (1997) and Becht, Bolton, and Roell (2003) for comprehensive review of the empirical work on relation between corporate governance and various corporate decisions including capital structure, accounting reporting, CEO turnover and compensation, and product market competition.

Furthermore, the evidence is consistent with the hypothesis that the stock market under-reacts to the agency problem of weakly governed firms.

The remainder of the essay is organized as follows: Section 2 discusses the relation between corporate governance, investment decisions, and firm value. Section 3 describes the data and variables used in the analyses. Section 4 discusses empirical tests and findings. Section 5 describes robustness tests. Section 6 concludes the essay.

2. CORPORATE GOVERNANCE, INVESTMENT DECISIONS, AND FIRM VALUE

Corporations spend large sums of money in various capital investments. For the period of 1990 to 2006, the average annual capital expenditures at U.S. firms equal to 8.54% of annual sales. Managers are the main capital investment decision makers, while it is well noted that they have their self-interests and do not always maximize shareholders value.[3] Given the significance of capital investments and the discretion of managers in making such decisions, an important research question is how effective a firm's corporate governance structure is in regulating the investment decisions made by the manager.

One strand of the literature has examined the relation between corporate governance structure and managers' decisions related to capital investments. Richardson (2006) and Gompers, Ishii, and Metrick (2003) find that firms with weak corporate governance structures are more likely to invest more. Harford, Mansi, and Maxwell (2008) and Dittmar and Mahrt-Smith (2007) find that weakly governed firms dissipate cash more quickly, primarily through acquisitions. Hartzell, Sun, and Titman (2006) find that investments of REIT firms are more closely related to investment opportunities for firms with high institutional ownerships. These papers provide evidence that corporate

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[3] See Williamson (1964), Donaldson (1984), and Jensen (1986), among many others.

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governance affects managers' decisions related to capital investments. However, an important question that remains unexplored is whether a firm's corporate governance structure indeed has an impact on the quality of its capital investments and hence on the firm value in the long run. This essay fills in this gap; it finds evidence that a strong corporate governance structure helps constrain managers from making bad investments, and hence enhances firm value and performance.

Another strand of the literature studies the relation between capital investments and firm value. While McConnell and Muscarella (1985) and Blose and Shieh (1997) find a positive reaction of the stock market to the announcement of significant capital investments, studies on the long term stock performance after capital investments, including Titman, Wei, and Xie (2004), Richardson and Sloan (2003), Xing (2008), Anderson and Garcia-Feijoo (2006), Lamont (2000), and Polk and Sapienza (2009), find that firms with higher capital investments have worse long run abnormal stock performance subsequently.

There are different hypotheses to explain this capital investment anomaly. The first hypothesis is that agency problems exist and managers invest in bad projects to build up their empire. The market under-reacts to such agency problems and the firm will have poor long run stock performance subsequently. Consistent with this hypothesis, Titman, Wei and Xie (2004) find that the negative abnormal capital investments and return relation is stronger for firms with greater investment discretion (high cash flow and low debt ratio), and does not exist in periods where empire builders were subject to hostile takeovers. An alternative hypothesis, however, is that the previous studies did not account adequately for changes in firm characteristics after capital investments and used incorrect benchmarks in calculating abnormal returns.

This essay helps to disentangle the two alternative hypotheses by relating a firm's performance after capital investments to its corporate governance structure. The evidence that the capital investment anomaly exists only for weakly governed firms favors the first hypothesis. In addition, the analysis of corporate governance and earnings announcement returns following capital investments also lends strong support to the over-investment and under-reaction hypothesis of the capital investment anomaly.

Several recent studies have explored the relation between corporate governance, corporate decisions related to capital investments, and firm value. Dittmar and Mahrt-Smith (2007) find that value of cash is significantly lower for firms with weaker governance.[4] They find that such firms dissipate cash more quickly in ways that significantly reduce operating performance; the results are robust after controlling for mergers and acquisitions. They conjecture that firms with weak governance waste money on bad investments. Harford, Mansi, and Maxwell (2008) find that weakly governed firms with excess cash increases capital expenditures and acquisitions. They also find that weakly governed firms with excess cash have lower profitability. However, neither of these studies tests directly whether weakly governed firms with high investments have worse performance.

Masulis, Wang, and Xie (2007) find that acquirers with more anti-takeover provisions experience significantly lower announcement stock returns and make diversifying acquisitions with greater frequency. My essay differs from their work in three aspects. First, their paper studies acquisitions, while this essay studies general corporate investments. Second, they use acquisition itself as a measure of overinvestment, while this essay constructs measure of abnormal corporate investments.

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[4] These findings are consistent with the evidence from Fauklkender and Wang (2006), which finds that the marginal value of one dollar cash is lower than a dollar. In addition, Cross-country studies provide evidence consistent with that from Dittmar and Mahrt-Smith (2007). For example, Pinkowitz, Stulz, and Williamson (2006), and Kalcheva and Lins (2007) find that the value of corporate cash holdings is lower in countries with weaker investor protection.

Finally, they study stock returns around announcement date of acquisitions, while this essay studies long run accounting and stock performance.

This essay examines how a firm's corporate governance structure affects its stock performance and earnings announcement returns following capital investments. Stock performance is a measure of market valuation and serves as a natural measure of firm performance. Earnings announcement returns provides additional insight into any market mis-pricing of information contained in corporate governance and capital investment decisions. In addition, if a significant portion of the difference in stock returns for firms with different corporate governance and amount of capital investments occurs around earnings announcements, then it is unlikely that such a difference is mostly driven by inadequate control of risks in measuring abnormal stock performance.

The measure of corporate governance examined in this essay is an index of the degree to which managers can become entrenched, developed by Bebchuk, Cohen, and Ferrell (2009) (the "Entrenchment Index"). This Entrenchment Index is based on the number of takeover defenses. I adopt the Entrenchment Index as the measure of corporate governance in this study for several reasons. First, in theory, takeover defenses can shelter managers from the market for corporate control ex post, and hence may weaken their incentive to invest optimally ex ante. As Gompers, Ishii, and Metrick (2003) argue, takeover defenses could cause higher agency costs "through some combination of inefficient investment, reduced operational efficiency, or self-dealing".

Second, the literature offers empirical evidence that takeover defenses are related to firm valuations. Earlier event studies provide moderate evidence that certain anti-takeover amendments reduce shareholder values.[5] More importantly, several recent studies on firm performance over a longer horizon find that adoption of takeover defenses

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[5] See DeAngelo and Rice (1983), Ryngaert (1988), and Malatesta and Walking (1988).

are negatively correlated to firms' stock performance. Gompers, Ishii, and Metrick (2003) develop the GIM Index, an index consisting of twenty four takeover defenses, and find that firms with less takeover defenses have higher firm value, higher profits, lower capital expenditures, and fewer corporate acquisitions. Bebchuck, Cohen, and Ferrell (2005) study six of the twenty four provisions used in Gompers, Ishii, and Metrick (2003), and find that it is this subset of six provisions, the components of the Entrenchment Index, that is driving the correlation between GIM Index and stock returns.[6]

Third, the literature provides empirical evidence that takeover defenses are related to level of over-investment. Richardson (2006) examines the association between corporate governance measures and amount of over-investment. The evidence suggests that among a comprehensive list of corporate governance measures, only anti-takeover provisions and activist shareholders are significantly associated with level of over-investment.

Finally, Titman, Wei, and Xie (2004) find that underperformance of firms with high capital investments occurs only in periods where takeover activities were less prevalent. This evidence suggests that takeover activities may alleviate the over-investment problem. It provides an additional motivation to use the Entrenchment Index, a set of takeover defenses, as a measure of corporate governance to study the relation between corporate governance, capital investments, and firm performance.

3. DATA DESCRIPTION

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[6] For more papers that use takeover defenses as a proxy for corporate governance, see Bebchuk and Cohen (2009), Cremers and Nair (2005), and Core, Guay, and Rusticus (2005), among many others.

3.1 Capital Investment

Accounting variables, including capital expenditures, sales, book equity and total assets, are collected from Compustat.

Following Titman, Wei, and Xie (2004), level of capital investments is measured by the amount of capital expenditures divided by sales. The implicit assumption inherited in this measure is that the expected amount of capital expenditures is proportional to sales. The level of expected capital investments of a firm in a given year is calculated as the average level of its capital investments in the past three years. The level of abnormal capital investments is calculated as the difference between the level of actual and expected capital investments.[7] In the analysis of stock performance and earnings announcement returns, firms in the sample are sorted into five quintiles by the level of abnormal capital investments in a given year.

3.2 Corporate Governance Measure

As discussed previously, the measure of corporate governance examined in this essay is the Entrenchment Index constructed by Bebchuk, Cohen, and Ferrell (2009). This comprehensive index consists of six provisions followed by the Investor Responsibility Research Center (IRRC): staggered boards, limits to amend by-laws, supermajority requirements for mergers, supermajority requirements for charter amendments, poison pills, and golden parachutes. Bebchuk, Cohen, and Ferrell (2009) find that firms with higher levels of the Entrenchment Index are associated with large negative abnormal returns, and the six provisions in the Entrenchment Index fully drive the correlation between the whole set of IRRC provisions and stock returns that was

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[7] In the section of Robustness Checks, I employ several alternative measures of capital investments and abnormal capital investments.

documented by Gompers, Ishii, and Metrick (2003). The Entrenchment Index takes a value from zero to six; the higher the value, the weaker the shareholders rights and the more entrenched the management.[8]

3.3 Performance Measures

In this essay, I examine two different aspects of firm performance: monthly stock returns and earnings announcement returns in the year following the capital investments. I analyze how these firm performance measures are associated with a firm's capital investment and corporate governance.

3.3.1 Stock Performance

Monthly stock return data are obtained from CRSP. In analyzing how stock performance is associated with capital investments and corporate governance, it is important to take into account the difference in risks associated with firm characteristics such as size, book-to-market ratio, and prior stock returns. The literature established empirical evidence on the association between such firm characteristics and cross-sectional stock returns. Firms with different levels of capital investments may be fundamentally different in such characteristics, and hence require different level of expected returns on their equity.

I follow Daniel, Grinblatt, Titman, and Wermers (1997) to construct characteristics-based benchmark returns and abnormal stock returns for each individual firm. Specifically, at the end of June each year, I form 125 portfolios based on three firm characteristics: book-to-market ratio, size, and momentum. The value weighted monthly

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[8] IRRC follows the provisions only in years 1990, 1993, 1995, 1998, 2000, 2002, and 2004. Following Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2009), for those years not recorded by IRRC, the information of the most recent preceding year with available provisions are adopted.

returns on the benchmark portfolios are calculated from July of the formation year to June of the following year. Benchmark portfolios are rebalanced every year. The abnormal stock return of an individual stock in a given month after the formation month is calculated as its raw return minus its benchmark portfolio's return in that given month:

Abnormal Stock Return $_{i, t}$ = Stock Return $_{i, t}$ – Stock Return $_{benchmark, t}$

3.3.2 Stock Returns around Earnings Announcement Dates

Earnings announcement dates are obtained from the Compustat Quarterly Industrial Database. Daily returns data around earnings announcement dates are obtained from Eventus. Cumulative annual earnings announcement return is calculated as the twelve-day cumulative stock return centered at the four quarterly earnings announcements dates (day minus one to day plus one around each announcement) in the year after the benchmark formation. Consistent with the construction of abnormal stock returns, the abnormal cumulative annual earnings announcement return of an individual stock is calculated as the difference between the cumulative earnings announcement returns of the stock and that of its characteristics-based DGTW benchmark portfolio:

Abnormal Cumulative Earnings Announcement Return $_{i,}$ = Cumulative Earnings Announcement Return $_{i}$ – Cumulative Earnings Announcement Return $_{benchmark}$

4. EMPIRICAL TESTS AND FINDINGS

4.1 Summary Statistics

The sample includes all Compustat firms with available data on corporate governance and capital investment. The sample starts from 1990, when the IRRC data

become available, and ends in 2006. Following the previous literature, I exclude firms from utility and financial industries (SIC codes between 4900-4999 and 6000-6999). I drop firm-year observations where total assets or sales are below 10 million, or book equity is negative.

Table 2.1 presents the summary statistics. Panel A reports the number of observations, mean, and standard deviation of key variables. The average firm in the sample has $5.5 billion of market equity, $10.0 billion of total assets, $4.1 billion of sales, and a market-to-book ratio of 1.75. For the average firm, the amount of capital expenditures accounts for 8.54% of its sales, and the value of the entrenchment index is 2.08.

Panel B of Table 2.1 reports the distribution of the Entrenchment Index – the measure of corporate governance examined in this essay. There are 20,875 firm-year observations with available data on the Entrenchment Index. The value of this index ranges from 0 to 6, where a value of 0 represents firms with the strongest shareholder rights and the least entrenched management and a value of 6 represents firms with the weakest shareholder rights and the most entrenched management. The value of the Entrenchment Index is unevenly distributed across the range of 0 to 6, where 2 is the post frequent value (26.0% firm-year observations) and 6 is the most infrequent value (0.3% firm-year observations).

Due to the imbalanced nature of the distribution of the Entrenchment Index, following the previous literature, I group firms by the value of the Entrenchment Index into three categories: (1) Low Entrenchment Group (with a value of 0 or 1); (2) Middle Entrenchment Group (with a value of 2); and (3) High Entrenchment Group (with a value between 3 and 6). The advantage of the grouping is that it provides adequate number of observations in each category and makes the distribution across groups more balanced.

Panel C of Table 2.1 reports the correlation coefficients among key variables. The Entrenchment Index is positively correlated with abnormal capital investments; on average, firms with weaker governance are more likely to have a higher level of abnormal capital investments. In addition, the Entrenchment Index is negatively correlated with market capitalization, market to book ratio, total assets, and sales; on average, firms with weaker governance are more likely to be smaller firms with lower market to book ratio.

Panel D of Table 2.1 further examines the association between firm characteristics and the Entrenchment Index. Consistent with Panel C, Panel D suggests that more entrenched firms are more likely to be associated with smaller market equity, total assets and sales, lower market-to-book ratio, and higher level abnormal capital investments.[9] The differences in these characteristics between the high and low entrenchment groups are statistically significant. The evidence suggests that, as discussed previously, in measuring the stock performance of different firms, it is important to take into consideration the differences of firm characteristics. The abnormal monthly stock returns and earnings announcement returns examined in this essay controls for differences in size, market-to-book, and prior stock performance.

4.2 The Entrenchment Index and Abnormal Capital Investments

As discussed previously, the literature provides evidence that the weaker the corporate governance structure, the more a firm invests, controlling for other firm characteristics. As a first step, I test whether this result holds for the sample and measure of corporate governance examined in this essay.

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[9] It is interesting to see that the abnormal level of capital investments, which is the level of capital investments scaled by sales and then adjusted for historical level, is slightly negative for firms in the low, middle, and high entrenchment groups. This means that overall the average level of capital investments scaled by sales was declining during the sample period.

As discussed previously, Panel D of Table 2.1 suggests that the average amount of abnormal capital investment for the high entrenchment index group is significantly higher than the amount for the low entrenchment group. In addition, un-tabulated test suggests that among firms in the highest two quintiles of abnormal capital investments, those with high entrenchment have significantly higher level of capital investment and abnormal capital investments than those with low entrenchment.

To examine the association between the Entrenchment Index and capital investments in a multivariate setting, I run multivariate regressions of the level of capital investments and abnormal capital investments on the Entrenchment Index, controlling for firm characteristics that are likely to be associated with the level of capital investments. These control variables include market-to-book ratio, book leverage, cash, firm age, total assets, past performance, and year dummies. The regressions are clustered at firm level. The t-statistics are robust to heteroskedasticity and within cluster correlations.

Table 2.2 presents the results of these multivariate regressions. The dependent variable of the first regression is the level of capital investments, and the dependent variable of the second regression is the level of abnormal capital investments. Results show that firms with a higher value of the Entrenchment Index are more likely to invest more, after controlling for other firm characteristics. This evidence is consistent with the findings from the previous literature. It is interesting to note that the coefficients of the Entrenchment Index from both regressions are approximately 0.002.[10] This suggests that the variation in the Entrenchment Index is associated with variations in the level and the abnormal level of capital investments of a similar magnitude. Given that the standard deviation of the Entrenchment Index is 1.34, one standard deviation change in the

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[10] The coefficient of the Entrenchment Index from the capital investment regression is 0.0018563 (with t-value of 3.79) and the coefficient of the Entrenchment Index from the abnormal capital investment regression is 0.0023970 (with t-value of 3.28).

Entrenchment Index results in a 0.27% change in level of capital investments and the level of abnormal capital investments. This amount is around a 3.2% of the sample mean level of capital investments, which equals 8.54%.

However, the evidence that more entrenched firms tend to invest more, by itself, does not necessarily indicates that such firms are more likely to make bad capital investments. To reach the latter conclusion, I need to examine the firm performance following capital investments and relate the performance to the Entrenchment Index. In the following sub-sections, I will analyze two different measures of firm performance: stock performance and earnings announcement returns.

4.3 Stock Performance, Capital Investments, and Corporate Governance

In this sub-section, I examine how monthly stock returns in the year following capital investments are related to the firms' level of abnormal capital investments and the value of the Entrenchment Index. Stock performance is a natural measure of firm performance following capital investments and a measure of market valuation of investment decisions.

First, I study how stock performance is related to capital investments. I sort firms into five portfolios (quintiles) based on the level of abnormal capital investments at the end of June each year, and calculate the value weighted monthly abnormal stock return in each month from July of one year to June of the following year. Panel A of Table 2.3 presents the results. The first five rows report the mean monthly stock returns of the five portfolios based on the level of abnormal capital investment and the last row reports the difference in stock returns between the two lowest and two highest quintiles of abnormal capital investments.

Consistent with the previous literature including Titman, Wei, and Xie (2004), I find that firms with a high level of abnormal capital investments underperform those with a low level of abnormal capital investments. The mean abnormal monthly stock return is 0.215% and 0.141% for the lowest two quintiles of abnormal capital investments, and -0.140% and -0.014% for the highest two quintiles of abnormal capital investments. The magnitude of the underperformance of the highest two quintiles of abnormal capital investments, compared to the lowest two quintiles, equals 0.255% per month or 3.1% annually, in the year subsequent to portfolio formation.

Next, I study how stock performance is related to corporate governance. As discussed previously, all sample firms are sorted into three groups based on the value of the Entrenchment Index. The value weighted monthly stock returns are calculated for each group in every month in the year subsequent to portfolio formation. Panel B of Table 2.3 reports the results. Consistent with Gompers, Ishii, and Metrick (2003), and Bebchuk, Cohen, and Ferrell (2009), more entrenched firms underperform less entrenched firms. The mean abnormal monthly stock return is 0.082% for the low Entrenchment Index group and -0.062% for the high Entrenchment Index group. The magnitude of the underperformance of high entrenchment firms, compared to low entrenchment firms, equals 0.144% per month or 1.7% annually, in the year subsequent to portfolio formation.

Finally, I analyze how corporate governance and capital investments interactively impact stock returns. In any given year, all sample firms are independently sorted into three groups based on the Entrenchment Index and quintiles based on the level of abnormal capital investments. The value weighted monthly stock returns are calculated for each group based on these two dimensions in the year subsequent to the portfolio formation. Table 2.4 presents the results. The first three columns represent the low,

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middle and high Entrenchment Index groups and the last column represents the difference between low and high Entrenchment Index groups. The first five rows represent the lowest to the highest quintiles of abnormal capital investments, and the last row represents the difference between the lowest two quintiles and highest two quintiles based on abnormal capital investments.

Findings from Table 2.4 suggest that firms with a high level of abnormal capital investments underperform firms with a low level of abnormal capital investments only among high entrenchment firms. The magnitude of this underperformance for high entrenchment firms is 0.353% per month or 4.2% annually, in the following year. This amount is both statistically and economically significant. In contrast, the level of abnormal capital investments is not related to subsequent stock performance for low entrenchment firms.

On the other hand, the underperformance of high entrenchment firms exists only among firms with a high level of abnormal capital investments. The magnitude of this underperformance of firms with high abnormal capital investments is 0.256% per month or 3.1% annually, in the following year. This amount is both statistically and economically significant. In contrast, entrenchment is not related to subsequent stock performance for firms with a low level of capital investments.

To examine whether the underperformance of firms with low entrenchment and high capital investments are robust when factor risks are accounted for, I run Fama-Macbeth Regressions of the monthly stock returns of portfolios formed based on the abnormal capital investment quintiles and the Entrenchment Index groups on the Carhart (1997) four factors, i.e., the market factor, the size factor, the market-to-book factor, and the momentum factor. Results are presented in Table 2.5. The alpha of the low minus high abnormal capital investment portfolio is significantly positive (0.283%) for high

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Entrenchment Index group; the corresponding alphas for low and middle Entrenchment groups are insignificant. The alpha of the low minus high Entrenchment Index portfolio is significantly positive (0.347%) for the subset of firms in the highest two quintiles of abnormal capital investments; the corresponding alphas for other quintiles of abnormal capital investments are insignificant. Table 2.5 suggests that the findings in Table 2.4 are robust after controlling for factor risks.

To summarize, results in this sub-section confirm the findings in the previous literature on the existence of the underperformance in stock returns of firms with high capital investments and the underperformance for firm with strong corporate governance, respectively. More importantly, this sub-section provides new evidence that the underperformance in stock returns after high investments exists only for weakly governed firms, and the underperformance of weakly governed firms exist only when the firms make abnormally high level of capital investments. These findings are consistent with the effectiveness of corporate governance in mitigating the over-investment problem. They are also consistent with the agency hypothesis of the capital investment anomaly.

4.4 Earnings Announcement Returns, Capital Investments, and Corporate Governance

In addition to the analysis of monthly stock returns, I study how earnings announcement returns are associated with capital investments and corporate governance. The analysis of earnings announcement returns sheds light on the evolvement of market expectations. More importantly, it helps to understand whether the findings on abnormal stock performance presented in the previous sub-section are real or due to benchmark errors. If the findings are driven by benchmark errors, then there should exist no difference in subsequent earnings announcement returns, since benchmark returns should not change dramatically around earnings announcement days. Alternatively, if

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overinvestment by entrenched firms is what drives the findings in the previous sub-section, there should be a significant difference in earnings announcement returns between firms with weak and strong governance that have invested an abnormally high amount; similarly, there should be a significant difference in earnings announcement returns between firms with low and high capital investments that are highly entrenched.

First, I study how earnings announcement returns are related to prior capital investments. I sort firms into quintiles based on the level of abnormal capital investments, for every year in the sample. Then I calculate the value weighted cumulative abnormal returns in the twelve days around subsequent four quarterly earnings announcements following the portfolio formation. Panel A of Table 2.6 presents the results. The cumulative earnings announcement returns of the lowest two quintiles of abnormal capital investments are on average 0.137% higher than those of the highest two quintiles of abnormal capital investments. However, the difference is not statistically significant.

Next, I study how returns around earnings announcements are related to corporate governance. Firms are sorted into three groups based on the value of the Entrenchment Index. Then I calculate the weighted cumulative returns in the twelve days around the subsequent four earnings announcements. Panel B of Table 2.6 reports the results. Firms with high entrenchment have lower returns around earnings announcements than firms with low entrenchment. The difference in returns in the twelve days around earnings announcements between the two groups is 0.328%. However, this difference is not statistically significant.

Finally, I study how corporate governance and capital investments interactively impact earnings announcement returns. I independently sort firms according to the level of abnormal capital investments and the value of the Entrenchment Index. The

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cumulative announcement returns for each portfolio based on these two dimensions are reported in Table 2.7. The first three columns represent the low, middle and high Entrenchment Index groups and the last column represents the difference between low and high Entrenchment Index groups. The first five rows represent the lowest to the highest quintiles of abnormal capital investments, and the last row represents the difference between the lowest two quintiles and highest two quintiles.

Findings from Table 2.7 suggest that firms with a high level of abnormal capital investments underperform firms with a low level of abnormal capital investments around earnings announcement days only among high entrenchment firms. The magnitude of this underperformance for high entrenchment firms is 1.068% in the twelve days around the four quarterly earnings announcements subsequent to the portfolio formation; this accounts for as high as 25% of the difference in abnormal stock performance between those two subgroups in that year, which is 4.2% as suggested by Table 2.4. This amount is both statistically and economically significant. In contrast, the level of abnormal capital investments is not related to subsequent earnings announcement returns for low entrenchment firms.

On the other hand, the underperformance in earnings announcement returns of high entrenchment firms exists only among firms in the highest two quintiles of abnormal capital investments. The magnitude of this underperformance of firms with high abnormal capital investments is 1.042% in the twelve days around the quarterly earnings announcements subsequent to the portfolio formation; this accounts for as high as 34% of the difference in abnormal stock performance between these two subgroups in that year, which is 3.1% as suggested by Table 2.4. This amount is both statistically and economically significant. In contrast, entrenchment is not related to subsequent earnings announcement returns for firms with a low level of capital investments.

This evidence in Table 2.7 suggests that the underperformance of weakly governed firms that invested intensively is not driven by benchmark errors. In addition, the market seems to under-react to the abnormal capital investments made by weakly governed firms and be surprised at subsequent earnings announcements.

5. ROBUSTNESS CHECKS

5.1 Sub-periods

To examine whether the findings in the main analyses for the whole sample period of 1991 to 2006 hold for sub-periods, I perform the tests in Table 2.3 and 2.4 separately for July 1991 to June 1999 and July 1999 to June 2006.

Table 2.8 presents the results for the sub-period of 1991 to 1999. Panel A shows that firms with a high level of abnormal capital investments underperform those with a low level of capital investments. The difference in abnormal stock returns between the lowest and highest two quintiles of abnormal capital investments is 0.341% per month or 4.1% annually, in the year subsequent to portfolio formation.

Panel B shows that more entrenched firms underperform less entrenched firms. The magnitude of the underperformance of high entrenchment firms, compared to low entrenchment firms, equals 0.210% per month or 2.5% annually, in the year subsequent to portfolio formation.

Panel C shows how corporate governance and capital investments interactively impact stock returns. Consistent with the findings in the main analyses, firms with a high level of abnormal capital investments underperform those with a low level of abnormal capital investments only among entrenched firms. The magnitude of this underperformance for high entrenchment firms is 0.463% per month or 5.6% annually, in

the following year. This amount is both statistically and economically significant. On the other hand, the underperformance of high entrenchment firms exists only among firms with level of high abnormal capital investments. The magnitude of this underperformance of firms with high abnormal capital investments is 0.342% per month or 4.1% annually, in the following year. This amount is both statistically and economically significant.

Table 2.9 presents the results for the sub-period of 1999 to 2006. Although the difference in stock performance between low and high capital investments quintiles and the difference between low and high entrenchment groups are positive, these differences are not statistically significant anymore.

In summary, it seems that the results from the main analyses are mainly driven by the sub-period of 1991 to 1999. During this sub-period, entrenched firms that made abnormally high level of capital investments experienced poor stock performance subsequently.

5.2 Sub-sample Excluding Equity Issuance

The previous literature has documented evidence that there exists negative abnormal stock performance after firms issue equity. It is important to show that the results on stock performance after capital investments in this essay are separate from the equity issues anomaly. I do this by excluding firms that issue equities. I identify equity issuers as firms with an amount of net equity issuance above a certain threshold. Table 2.10 excludes firms with net equity issuance above 10% of total assets, and Table 2.11 excludes firms with net equity issuance above 5% of total assets. Net equity issuance is defined as the change in book equity minus the change in retained earnings.

The findings in the main analyses are robust to the exclusion of equity issuance. Panel A and Panel B of Table 2.10 shows that excluding firms with net equity issues above 10% of total assets, firms with a high level of abnormal capital investments underperform those with a low level of abnormal capital investments by 0.329% per month or 3.9% annually, and high entrenchment firms underperform low entrenchment firms by 0.204% per month or 2.4% annually. Panel C shows that the underperformance of firms with a high level of abnormal capital investments exists only among high entrenchment firms; the magnitude of this underperformance is 0.502% per month or 6.0% annually. On the other hand, the underperformance of high entrenchment firms exists only among firms with a high level of abnormal capital investments; the magnitude of this underperformance is 0.378% per month or 4.5% annually.

Table 2.11 presents the findings using a sub-sample that excludes firms with net equity issuance above 5% of total assets. The results are qualitatively and quantitatively similar to the findings in Table 2.10. Panel A and Panel B shows that excluding firms with net equity issues above 5% of total assets, firms with a high level of abnormal capital investments underperform those with a low level of abnormal capital investments by 0.317% per month or 3.8% annually, and high entrenchment firms underperform low entrenchment firms by 0.165% per month or 2.0% annually. Panel C shows that the underperformance of firms with a high level of abnormal capital investments exists only among high entrenchment firms; the magnitude of this underperformance is 0.504% per month or 6.0% annually. On the other hand, the underperformance of high entrenchment firms exists only among firms with a high level of abnormal capital investments; the magnitude of this underperformance is 0.370% per month or 4.4% annually.

In summary, the findings in the main analyses are robust to the exclusion of equity issuance. In other words, the findings in the main analyses are not driven by the equity issues anomaly.

5.3 Governance Index as of the Beginning of the Sample Period

It is important to address potential endogeneity problems in any research on corporate governance. This essay addresses potential endogeneity problems in several different ways. First of all, this essay examines the interaction between governance and capital investments, while controlling for governance itself. If an endogenous relation between corporate governance and firm performance exists, it is more likely to be revealed through the governance term rather than the interaction term. This is especially true because the level of capital investments varies significantly more than corporate governance structure over time.

One form of endogeneity is omitted variables. While it is impossible to list all potential omitted variables, one that many would consider is managerial ability. It is possible that managers with inferior abilities display poor performance, and at the same time, such managers tend to favor the adoption of takeover provisions and spend huge amount of money in investments. This endogeneity problem can be alleviated by controlling for past performance in the measurement of abnormal performance, if managerial abilities are partly reflect in past performance. As discussed previously, both the abnormal stock performance and the abnormal earnings announcement returns in this essay are measured against benchmark firms with similar prior performance, among other firm characteristics. Such construction of abnormal performance alleviates the endogeneity problem caused by omitted variable of managerial abilities.

A second form of endogeneity is reversed causality. It could be the case that in expectation of poor performance, mangers adopt takeover provisions to entrench themselves. As stated above, the interaction with capital investments makes this argument harder to make. Nevertheless, in this sub-section, I perform the analyses of stock performance using the governance data in the first year the data become available (governance data as of 1990) instead of the slowly changing contemporaneous governance data.[11] Results are robust to this alternative measure of corporate governance.

Table 2.12 shows that using Entrenchment Index as of 1990, the findings from Table 2.2 hold. Firm with higher level of entrenchment, measured by the value of Entrenchment Index as of 1990, are more likely to invest more, after controlling for other firm characteristics. The coefficients of the Entrenchment Index for both regressions of capital investments and abnormal capital investments are significantly positive.

Table 2.13 examines how stock performance is associated with capital investments and level of entrenchment, where entrenchment is measured by the value of the Entrenchment Index as of 1990. Panel B shows that high entrenchment firms do not significantly underperform low entrenchment firms for the overall sample. This is not surprising given that the governance measure is stale rather than contemporary.

What is more interesting for the purpose of this essay is whether the evidence of the interaction of entrenchment and capital investments holds using this alternative governance measure that is less subject to endogeneity. Panel C of Table 2.13 shows that even with the stale entrenchment measure, results in Table 2.4 hold. Firms with a high level of abnormal capital investments underperform those with a low level of abnormal capital investments only among entrenched firms. The magnitude of this

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[11] This technique was employed by Bebchuk, Cohen, and Ferrell (2009) and Dittmar, Mahrt-Smith (2007).

underperformance for high entrenchment firms is 0.470% per month or 5.6% annually, in the following year. This amount is both statistically and economically significant. On the other hand, the underperformance of high entrenchment firms exists only among firms with high level of abnormal capital investments. The magnitude of this underperformance of firms with high abnormal capital investments is 0.302% per month or 3.6% annually, in the following year. This amount is both statistically and economically significant.

In summary, the findings suggest that entrenched firms with a high level of abnormal capital investments are more likely to experience poor stock performance subsequently. Such findings are robust to the alternative measure governance, the Entrenchment Index as of 1990. The evidence suggests that the findings in this essay are not likely to be driven by endogeneity.

5.4 Alternative Measures of Capital Investments

In this sub-section, I examine whether the findings on stock performance is robust to alternative measures of capital investments.

5.4.1 Industry Adjusted Abnormal Capital Investments

The first alternative measure of abnormal capital investment is industry adjusted level of capital investments. The expected level of capital investments of a firm in a year is calculated as the median of capital investments of firms in the same Fama and French (1997) forty-eight industry in that given year. The abnormal capital investment is calculated as the difference between the actual and expected level of capital investments.

Table 2.14 presents the findings. Panel A shows that the underperformance of firms with a high level of abnormal capital investments is positive but insignificant for

the overall sample. What is more interesting for the purpose of this essay is whether the

evidence of the interaction of entrenchment and abnormal capital investments holds using

this alternative measure of abnormal capital investments. Panel C of Table 2.13 shows

evidence that is consistent with results presented in Table 2.4. Firms with a high level of

abnormal capital investments underperform those with a low level of abnormal capital

investments among entrenched firms. The magnitude of this underperformance for high

entrenchment firms is 0.275% per month or 3.3% annually, in the following year.

However, this amount is not statistically significant. On the other hand, the

underperformance of high entrenchment firms exists only among firms with a high level

of abnormal capital investments. The magnitude of this underperformance of firms with

a high level of abnormal capital investments is 0.542% per month or 6.5% annually, in

the following year. This amount is both statistically and economically significant.

In summary, results of the analyses of stock performance using industry adjusted

capital investments are consistent with the findings in the main analyses.

5.4.2 Characteristics Adjusted Abnormal Capital Investments

The second alternative measure of abnormal capital investments takes into

consideration differences in firm characteristics. I run a clustered panel regression of

capital investments on lagged market to book ratio, lagged book leverage, lagged cash,

firm age, lagged firm size, prior stock run up, and lagged capital investments. I take the

residual as the amount of abnormal capital investments of the firm, and form the

Abnormal Capital Investments quintiles based on this measure.

Table 2.15 presents the findings. Panel A shows that the underperformance of

firms with a high level of abnormal capital investments is positive but insignificant for

the overall sample. What is more interesting for the purpose of this essay is whether the

evidence of the interaction of entrenchment and abnormal capital investments holds using this alternative measure of abnormal capital investments. Panel C of Table 2.14 shows evidence that is consistent with results presented in Table 2.4. Firms with a high level of abnormal capital investments underperform those with a low level of abnormal capital investments only among entrenched firms. The magnitude of this underperformance for high entrenchment firms is 0.239% per month or 2.9% annually, in the following year. However, this amount is not statistically significant. On the other hand, the underperformance of high entrenchment firms exists only among firms with a high level of abnormal capital investments. The magnitude of this underperformance of firms with high abnormal capital investments is 0.344% per month or 4.1% annually, in the following year. This amount is both statistically and economically significant.

In summary, results of the analyses of stock performance using firm characteristics adjusted capital investments are consistent with the findings in the main analyses.

5.4.3 Capital Expenditures and Mergers & Acquisitions

The measure of capital investments in the main analyses includes only capital expenditures. In this sub-section, I use a broader measure of capital investments, which includes both capital expenditures and acquisitions. Findings in the main analyses are robust to this alternative measure of capital investments.

Table 2.16 presents the findings. Panel A shows that the underperformance of firms with a high level of abnormal capital investments is positive but insignificant for the overall sample. What is more interesting for the purpose of this essay is whether the evidence of the interaction of entrenchment and abnormal capital investments holds using this alternative measure of abnormal capital investments. Panel C of Table 2.16 shows

evidence that is consistent with results presented in Table 2.4. Firms with a high level of abnormal capital investments underperform those with a low level of abnormal capital investments only among entrenched firms. The magnitude of this underperformance for high entrenchment firms is 0.323% per month or 3.9% annually, in the following year. This amount is both statistically and economically significant. On the other hand, the underperformance of high entrenchment firms exists only among firms with high level of abnormal capital investments. The magnitude of this underperformance of firms with high abnormal capital investments is 0.498% per month or 5.9% annually, in the following year. This amount is both statistically and economically significant.

In summary, the findings in the main analyses are robust to the measure of abnormal capital investments that incorporates both capital expenditures and acquisitions as capital investments.

6. CONCLUSION

This essay studies whether corporate governance impacts firm value through capital investments. I find that among firms with weak corporate governance, those with high abnormal capital investments significantly underperform those with low abnormal capital investments. The difference in abnormal stock performance is 4.2% in the year following the capital investments, which is both statistically and economically significant. In addition, a significant portion of the difference in stock performance between these two subgroups occurs around earnings announcements. In contrast, the level of abnormal capital investments is not related to subsequent stock performance or earnings announcement returns for firms with strong corporate governance.

On the other hand, among firms with a high level of abnormal capital investments, firms with weak corporate governance underperform firms with strong

corporate governance. The difference in abnormal stock performance is 3.1% in the year following the capital investments, which is both statistically and economically significant. In addition, a significant portion of the difference in stock performance between these two subgroups occurs around earnings announcements. In contrast, strength of corporate governance is not related to subsequent stock performance or earnings announcement returns for firms with a low level of abnormal capital investments.

These findings provide evidence for the role of corporate governance structure in mitigating the overinvestment tendency of mangers and hence increasing firm value. Furthermore, the evidence is consistent with the hypothesis that the stock market under-reacts to the agency problem of weakly governed firms.

This essay establishes evidence for one specific channel through which corporate governance structure increase firm value – capital investment decisions. Strong corporate governance mitigates the overinvestment problem and hence enhances firm performance. In addition, this essay provides potential explanation for the capital investment anomaly. It supports the hypothesis that the market under-reacts to overinvestment of weakly governed firms.

The essay has the following implications. First, investors in the stock market should be cautious about high investments made by weakly governed firms. On average investors would benefit from selling or not holding stocks of such firms. Second, corporations should make efforts to reduce the level of managerial entrenchment and strengthen the corporate governance structures. The benefit of a stronger corporate governance structure would come from two sources: from forcing the management to make better investment decisions, as well as from sending a good signal about the quality of the capital investments to the investors in the stock market.

Chapter 3: Insider Trading and Investment, Operating, and Financing Decisions of SEO Firms

1. MOTIVATION

This essay examines how pre-issue insider trading is related to subsequent investment, operating, and financing decisions of SEO firms for evidence on the decision to issue equity.

Myers and Majluf (1984) provide a theoretical model for the firm's decision to issue additional equity that suggests that firms do not only issue equity to fund growth opportunities. Rather, their model suggests that asymmetric information between insiders and outside investors can result in a pooling equilibrium in which both firms with good growth opportunities and those without good growth opportunities may issue equity. The latter may issue equity when managers believe their firms' shares are over-valued.[12]

It is not easy to differentiate between issuers with over-priced shares and those with good growth opportunities because insiders' perceptions of their firms' valuations and timing opportunities are not directly observable. However, it is plausible that insider trading, which is observable, could reflect information about insiders' perceptions of firm value.

The literature on insider trading and seasoned equity offerings (SEOs) provides evidence that insiders sell more heavily around SEOs. However, there exists mixed evidence on whether insider trading predicts the long run performance of SEO firms. While Lee (1997) and Lee (2002) find that insider trading is not related to long run stock

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[12] Many empirical studies report evidence that is consistent with the hypothesis that firms conduct SEOs when insiders believe that their shares are over-valued. For example, Loughran and Ritter (1995, 1997), and Spiess and Affleck-Graves (1995) find that, on average, issuers of seasoned equity subsequently underperform their benchmarks in the long run. In a survey of practitioners, Graham and Harvey (2001) find that 67 percent of the CEOs identify the magnitude of equity over-valuation or under-valuation as either an important or a very important factor in making common equity issuance decisions.

performance of primary seasoned equity issuers, Kahle (2000) and Clarke, Dunbar, and Kahle (2000) find that stock returns of industrial SEO issuers with abnormally high insider selling are lower than those of benchmark firms. Given the difficulty in constructing a convincing measure of abnormal long run stock performance, research on other aspects of the issuer, in addition to stock performance, is needed to understand whether insiders knowingly time the equity market.

This study examines how insider trading activity prior to SEOs is related to subsequent investment, operating, and financing decisions of the issuers. I find that SEO firms with more abnormal insider sales issue more seasoned equity. Such firms do not make more investments; rather, they hold the extra proceeds in cash balance and increase dividend payouts more. There also exists weak evidence that such firms tend to have worse operating performance and they issue less equity subsequently to reverse the effects of equity issuance on their capital structures.

These findings suggest that SEO firms with more abnormal insider sales are more likely to have overpriced stock, while those with less abnormal insider sales are more likely to have good investment opportunities. Insiders have superior information about the firm value and they use this information to time both personal trades and public equity offerings. Insider trading activity prior to SEOs provides valuable information about the firms' incentives to issue seasoned equities. In addition, insider information about the issuer's valuation not only influences the firm's decision to issue seasoned equity, but also has an impact on the firms' real activities following the SEO. Pre-issue Insider trading activity helps predict subsequent investment, operating, and financing decisions of the issuer.

This essay contributes to the literature in several ways. First, the analysis of real activities following SEOs provides evidence that insiders knowingly time the equity

market. This evidence adds to that from previous studies of insider trading and SEO performance, which mainly focus on the stock performance and yield mixed results.

Second, while many studies examine how insider trading activity is related to the equity issuance decision, none examines whether misvaluation of the issuer's stock is related to its subsequent investment, operating, and financing decisions. This study is the first to document that insiders' perceptions of firm values, reflected in their pre-issue personal trading, not only influence manager's decisions to issue equity, but also affect the real activities of the firms following the SEO.

Third, this study finds evidence that the market timing attempts of SEO issuers have only temporary effects on the firms' capital structures. There is an ongoing debate on whether the effect of market timing efforts on capital structures is persistent or temporary. On one hand, Baker and Wurgler (2002) and Huang and Ritter (2007) find that historical market timing measures have persistent effects on firms' capital structures; on the other hand, Kayhan and Titman (2007) and Alti (2006) use alternative measures of market timing opportunities and find that the timing effects on leverage quickly reverse for market timers.

The remainder of this essay is organized as follows: Section 2 discusses the motivation for using insider trading as a measure to differentiate market timers and growth firms. Section 3 lists testable hypotheses and Section 4 describes the data and variables used in the analysis. Section 5 presents the empirical tests and findings. Section 6 describes robustness checks. Finally, Section 7 concludes the essay.

2. MARKET TIMING AND INSIDER TRADING

It is difficult to differentiate between firms that are simply timing the market and firms that are funding growth opportunities. One reason is that it is not possible to

directly observe insiders' valuation of their firms and their perception of market timing opportunities. Several proxies for equity mis-valuation and timing opportunities are used in the literature. Some studies use aggregate market timing measures. For example, Alti (2006) finds evidence that firms that complete an IPO in a hot equity market are more likely to be market timers, while firms go public in cold equity markets are more likely to be growth firms. While such a classification scheme measures market-wide timing opportunities, it is not designed to capture the difference in market timing opportunities among individual firms, which calls for a firm-specific market timing measure.

One commonly used firm-specific measure of market timing opportunity is the market-to-book ratio. The rationale for using this measure is that a firm is more likely to be overvalued if the market perceives its value to be much higher than its book value. However, a firm's market-to-book ratio is a very noisy proxy for mis-valuation. This ratio could be high when the firm has good growth opportunities and the market incorporates this information in its valuation. In addition, even if the market-to-book ratio captures market's perception of misevaluation, market perception could deviate from the perception of insiders, who make the decision of issuing equity. Therefore, the market-to-book ratio is not a good measure with which to distinguish between market timers and growth firms.

An alternative measure of firm-specific market timing opportunities is estimated using valuation models. Jindra (2000), among others, estimates the mis-valuation of shares of SEO issuers by computing the difference between the actual market value and the estimated fair value of those shares. Given that the fair value is estimated using accounting variables, the validity and accuracy of the market timing measure is highly dependent on the specification of the model. In addition, as with the market-to-book

ratio, this misevaluation measure is based on public information instead of inside information.

Ex-post firm performance might also be used to identify shares that are misvalued. For example, Jung, Kim, and Stulz (1996) use the actual long-term abnormal returns following SEOs as a proxy for insiders' perceptions of a firm's value. A problem with this measure, as noted by the authors, is that the cross-sectional standard deviation of post-issue performance and, hence, the standard errors are extremely large. As a result, the empirical tests lack of explanatory power.

This essay develops a measure of market timing opportunities based on insider trading. While how insiders value their firm's market timing opportunities and share values is not directly observable, trading activities of insiders are. We should expect that insider trading activity reflects the information that insiders have about the current condition and future prospects of their firm. For this reason, this study uses insider trading to differentiate between market timers and growth firms among SEO issuers.

The idea that insiders have superior information is well known and is well summarized in the following excerpt from discussion on insider trading activity from the February 1998 issue of *Individual investor*:

"Company executives and directors know their business more intimately than any Wall Street analyst ever would. They know when a new product is flying out the door, when inventories are piling up, whether profit margins are expanding or whether production costs are rising… you always hear about the smart money. Generally, that is the smart money."

If insiders have private information about the future prospects and value of their firm, and adjust their own holdings accordingly, then we expect to see that insiders are more likely to sell their shares prior to an SEO if they believe the stock is overvalued, and

are more likely to maintain or increase their shareholdings when they believe the issuing firm has good growth opportunities.

Many studies have examined the relation between SEOs and insider trading activity. These studies generally focus on either the relation between insider trading activity and the decision to issue equity, or the relation between the insider trading activity and stock performance around SEOs.

The first group of studies documents the existence of abnormal insider trading activity around SEOs. Karpoff and Lee (1991) find significant insider selling prior to the announcement of common stock issues. Gombola, Lee, and Liu (1999) find that the significant insider selling prior to the offering announcement continues after the announcement is made public. Jenter (2004) finds that managers try to actively time the market both in their private trades and in corporate financing decisions. These findings are consistent with the hypothesis that insider information affects to both insider trading and equity offerings.

The second group of studies examines whether insider trading around SEOs is related to issuers' stock performance. These studies provide mixed evidence.

Studies on short-term stock performance provide mixed evidence. Lee (1997) and Gombola, Lee, and Liu (1999) find insignificant relation between insider trading and the SEO announcement returns. In contrast, Kahle (2000) finds that SEO announcement returns are significantly negatively related to insider selling.

Studies on long-term stock performance also provide mixed results. Lee (1997) and Lee (2002) find no significant relation between trading by top executive and the long-run stock performance of primary SEO firms that sell new shares. On the other hand, Kahle (2000) and Clarke, Dunbar, and Kahle (2001) find that industrial SEO issuers with abnormally high insider selling underperform their benchmark firms in the

long run, whereas SEO firms with abnormally high insider buying do not. The mixed evidence is not very surprising, given that the analysis of long run performance following SEOs is very sensitive to the choice of the benchmark for expected stock returns and the way in which long run abnormal stock returns are computed.

Because of this lack of clarity for abnormal stock return studies, this study looks to the real activities of firms following SEOs for evidence on whether firms time these offerings to take advantage of over-priced shares. The analysis of real activities offers many insights on equity market timing that the study of stock returns cannot provide.

One implication of market timing is that market timers issue more equity than they need. Therefore, analysis of usage of proceeds helps us to understand whether firms time the equity markets. It is more straightforward to analyze how the issuers use the proceeds from SEOs than to estimate abnormal long run stock performance following SEOs. Second, insiders may have better information about their firms' future operating performance than about future stock returns. Evidence from operating performance provides additional evidence of insiders' timing abilities. Finally, if the trade-off theory of capital structure holds, market timers deviate from their target capital structure by issuing equity and they will undo the effects of market timing following SEOs. The analysis of post-issue financing decisions sheds light on the validity of this prediction.

3. HYPOTHESES

This study tests several hypotheses of how insider trading would be associated with the real activities of SEO firms, which I describe in this sub-section.

3.1. Amount of Equity Issues and Usage of Proceeds

The idea that managers time the equity markets has several implications. First, firms are more likely to issue equity when insiders perceive their firms to be undervalued. Second, controlling for other firm characteristics, market timers issue more equity. In addition, to the extent that market timers raise more equity capital than they need, they are more likely to hold more of the proceeds in the form of cash or distribute more cash as dividends, rather than using the proceeds to increase the level of their investment activity.[13] Cheng (1995) finds that the long run underperformance is most severe for equity issuers that do not invest the proceeds in capital projects. Kim and Weisbach (2008) find that firms tend to keep a faction of the money raised in equity offer in cash balance, and this fraction is substantially higher for firms with higher market valuations. Using aggregate IPO volume as a proxy for market timing opportunities, Alti (2006) finds evidence consistent with the above prediction about the amount of equity issues, investment, cash holding, and dividend payout of market timers.

Using insider trading as a proxy for market timing opportunities, this study tests the following hypotheses regarding the amount of equity issues and the usage of proceeds from the SEO: (1) SEO firms with more abnormal high pre-issue insider sales raise more capital in the SEO; (2) such issuers increase their cash balances and/or payouts following the SEO; and (3) they do not make more capital investments.

3.2. Operating Performance Following SEOs

Loughran and Ritter (1997) document that on average post-issue operating performance of SEO firms deteriorates. Piotroski and Roulstone (2005) find that insider

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[13] With the existence of agency problem, it is plausible that market timers are more likely to invest in negative NPV projects, since insiders of these firms have sold more of their own shares and have less incentive to maximize firm value. However, empirical study of Richardson (2006) finds no relation between insider shares and estimated amount of over-investment.

purchases are positively related to firms' future earnings performance. However, no study has examined whether insider trading around SEOs is related to post-issue earnings performance.

Using insider trading as a proxy for market timing opportunities, this study tests the following hypotheses: SEO firms with more abnormal high pre-issue insider sales are more likely to exhibit worse long-term operating performance subsequent to the SEO.

3.3. Capital Structure Following SEOs

Several studies examine how market timing attempts are associated with subsequent capital structure decisions, and specifically, whether the effects of market timing on capital structure persist or reverse subsequently.[14] These studies provide mixed evidence. Baker and Wurgler (2002) construct a historical market timing measure using the market-to-book ratio as a proxy for the timing opportunity perceived by managers. They find that firms' leverage ratios are strongly related to historical market timing measures and that the effects persist beyond ten years. Huang and Ritter (2007) find that historical values of the cost of equity have persistent effects on firms' capital structures. In contrast, Kayhan and Titman (2007) propose an alternative market timing measure based on the market-to-book ratio, and find that capital structure changes are not persistent. Alti (2006) identifies market timers as firms that go public in a hot IPO market, and finds that timing effects on leverage quickly reverse for such firms.

If firms target at a specific level or a range of leverage ratios, and market timers deviate from the target because their market valuation is temporarily high, then SEO firms with more abnormal insider sales would be expected to subsequently undo the

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[14] The research question regarding persistence of market timing effects on capital structure is important because persistence would imply that the traditional determinants of capital structure studied in the literature would have limited roles in explaining firm financial policies.

market timing effects on capital structures.[15] In other words, such firms would be more likely to increase their leverage in the years following the SEO. In contrast, SEO firms with less abnormal high insider purchases are more likely to be firms that have recently obtained new growth opportunities, and hence, require a lower target leverage to maintain financial flexibility, which is predicted by traditional trade-off theory of capital structure. Such firms would be less likely to reverse the effects of the SEO on their capital structures.

4. DATA DESCRIPTION

4.1. SEO Data

The original sample consists of SEOs conducted during the period of 1986 to 2003, recorded by the Securities Data Company (SDC).[16] Following the previous studies on SEOs, I exclude the following firms from the original SEO sample: (1) rights issues; (2) unit issues; (3) spin-offs and (4) shelf registrations; (5) SEOs within a year from last equity issuance.

4.2. Accounting and Financial Data

Accounting and financial data are obtained from Compustat Industrial Annual dataset on WRDS. I exclude the following firms from the original SEO sample: (1) firms with no data on Compustat Industrial Annual dataset; (2) financial firms with SIC codes between 6000 and 6999; and (3) utility firms with SIC codes between 4900 and 4999.

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[15] Graham and Harvey (2001)'s survey reports that 37% of the survey respondents have a flexible target, 34% have a somewhat tight target or range and 10% have a strict target.

[16] The sample starts in 1986, the earliest year for which the Thompson Financial Insiders dataset is available.

Variables are defined as follows.[17]   Book debt (BD) is defined as total liabilities (COMPUSTAT Annual data181) and preferred stock (Data10) minus deferred taxes (Data35) and convertible debt (Data79). Book equity (BE) is total assets (Data6) minus book debt. Book leverage (BL) is defined as book debt divided by total assets. Firm-year observations where book leverage exceeds 100% are dropped. Amount of net debt issues is the change in book debt divided by total assets. Amount of net equity issues is the change in book equity minus the change in retained earnings (Data36), divided by total assets. INV is capital expenditures (Data128) divided by total assets. DIV is common dividends (Data21) divided by book equity. CASH is cash and short-term investments (Data1) divided by total assets. ΔCASH is the change in data1 divided by total assets. Newly retained earnings (newlyRE) is the change in retained earnings divided by total assets.

Market-to-book ratio (MtoB) is book debt plus market equity (common shares outstanding (Item 25) times share price (Data199)) divided by total assets. As in Baker and Wurgler (2002), I drop observations where the market-to-book ratio exceeds 10.0. Profitability is measured by EBITDA, which is earnings before interest, taxes, and depreciation (Data13) divided by assets. SIZE is the logarithm of net sales (Data12). Asset tangibility (PPE) is defined as net plant, property, and equipment (Data8) divided by assets. R&D is research and development expense (Data46) divided by net sales (data12).[18]   These variables have been shown in the literature to have significant impacts on firms' capital structures and financing decisions.[19]

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[17] The definitions of the variables are consistent with the capital structure literature, such as Baker and Wurgler (2002). See Kayhan and Titman (2007) Table 1 for a detailed reference of the literature using these definitions.

[18] In the regressions I also control for RDD, a dummy variable that equals one if R&D data is missing.

[19] See Titman and Wessels (1988), Rajan and Zingales (1995), and Hovakimian, Opler and Titman (2001).

Other control variables in the regression analysis are as follows. Prior stock return is the twelve month cumulative stock returns prior to the SEO. Days since IPO is the number of days since the IPO date. Primary Shares % is the percentage of primary shares in the equity offering. SEO firms with different levels of insider sales could differ in prior stock returns, firm age, and percentage of primary shares. Therefore, it is important to control for these characteristics in analyzing the real activities of SEO firms.

Finally, to control for differences in investment, operating, and financing decisions across industries, I include industry dummies based on the 48-industry categorization in Fama and French (1997) in all regressions. In addition, to control for differences in firms' investment, operating, and financing decisions across time, I include year dummies in all regressions.

4.3. Insider Trading Data

Data on insider trades of SEO firms are obtained from the Thomson Financial Insiders dataset on WRDS. For each SEO firm, I summarize the open market stock purchases and sales of top executives and directors transacted during the six-month period ending on the issue date of the SEO.[20] Following the previous literature on insider trading, I exclude transactions involving less than 100 shares.[21]

There are several alternatives in constructing the measure of insider trading activity. The first alternative measure is the level of insider trading prior to the SEO. While this is a most straightforward measure of insider trading, SEO firms with different level of insider trading activity may be fundamentally different, and hence, hard to

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[20] I include only open market insider trades reported to the SEC and classified under the "directors" and "officers" categories in the Thomson Financial Insider data. Previous research has shown that trades by principal shareholders who are not officers or directors do not convey much information. See Seyhun (1986) and Kahle (2000).
[21] See Lee (1997) and Kahle (2000), among others.

compare. Alternatively, abnormal level of insider trading activity can be constructed, controlling for either historical level of insider trading or firm characteristics and firm fixed effects. Therefore, the second alternative measure of insider trading is the abnormal level of pre-SEO insider trading above historical level, and the third alternative is the abnormal level of pre-SEO insider trading controlling for firm characteristics and fixed effects.

In the main analyses, I employ the second alternative of insider trading, abnormal insider trading above historical level, which is a simple measure that takes into consideration the potential heteroskadasticity in insider trading activity across firms. Specifically, I define a variable called Abnormal Sales Percentage, which equals the difference between the percentage of insider sales in the six months prior to the SEO and the expected percentage of insider sales based on historical level. Percentage of insider sales is calculated as one plus total number of insider sales divided by two plus sum of total number of insider sales and insider purchases during the same period. The expected percentage of insider sales is calculated as percentage of insider sales in the year starting at two year prior to the SEO.[22] As discussed above, the advantage of this simple measure of abnormal insider sales is that it takes into account the heteroskadasticity of insider trading activities across firms.

In the section of robustness checks, I perform the analyses using the other two alternative measures of insider trading. Key findings are robust to these alternative measures of inside trading. In addition, I examine insider trading reported in the six months prior to the SEO, rather than insider trading transacted in the six months prior to

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[22] This is similar in spirit to how Kahle (2000) defines abnormally high insider trading. However, I use a shorter period (one year instead of four years in Kahle (2000)) to calculate the expected insider trading because firm characteristics could have changed dramatically in four years. In addition, my definition with a shorter period to measure the expected level of insider trades offers a much larger sample.

the SEO. The finings using this alternative insider trading measure is also presented in the section of robustness tests.

5. EMPIRICAL TESTS AND FINDINGS

5.1. Insider Trading Prior to SEOs

To study whether insider trading is related to equity market timing, the first step is to examine whether insider trading activity changes substantially prior to SEOs. As discussed previously, several empirical studies provide evidence on abnormally high insider selling prior to SEOs.[23] I examine whether this result holds in the sample examined in this study.

Table 3.1 shows the patterns of insider trading prior to SEOs. Panel A of Table 3.1 reports the mean and standard deviation of numbers of insider sales and insider purchases. Consistent with findings from the previous literature on insider trading and SEOs, insiders tend to sell more and purchase less prior to SEOs. The average number of insider sales in six months increases from 3.2 in the three years ending at one year prior to the SEO to 7.4 in the six months prior to SEOs. The average number of insider purchases decreases from 2.1 to 1.2 correspondingly. Panel B of Table 3.1 shows that the change in number of insider sales and the change in number of insider purchases in the six months prior to SEOs are both economically and statistically significant. The dramatic change in insider trading activity prior to SEOs suggests that such activity is related to the issuance of the seasoned equity.

It is also important to note that there is substantial variation in insider trading activity among issuers in the six months prior to SEOs. The standard deviation of the

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[23] See Karpoff and Lee (1991) and Gombola, Lee, and Liu (1999).

number of insider sales is 19.4, and the standard deviation of the number of insider purchases is 3.2. These variations are consistent with that insiders' perception of their firm' value varies prior to the SEO and that insider trading activity in this period could convey information on such perception.

The change and variation in insider trading activity in the six months prior to SEOs confirm the validity of employing a measure of abnormal insider trading based on trades during this period as a proxy for inside information regarding firm values and market timing opportunities. As discussed previously, I define Abnormal Sales Percentage as the percentage of insider sales in the six months prior to the SEO minus the historical percentage of insider sales in the year starting at two year prior to the SEO. I examine how this Abnormal Sales Percentage is related to the investment, operating, and financing decisions of issuers following SEOs.

In the analyses of insider trading and a firm's investment, operating, and financing decisions, it is important to control for other firm characteristics for several reasons. First, firm characteristics at the time of the SEO can be associated with firm's market timing opportunities. As discussed previously, the market-to-book ratio prior to the SEO can be associated with its market timing opportunities. Similarly, prior stock returns and percentage of primary shares offered in an SEO can also be associated with a firm's market timing opportunities. In addition, as discussed previously, whether an SEO is completed in a hot equity market can be associated with market-wide timing opportunities.

Second, several firm characteristics can be related to insider trading incentives not associated with insiders' valuation of the firm. Time since IPO can proxy for a firms' stage in life cycle and hence be associated with insiders' incentive to diversity their

portfolio. Prior stock returns can also be associated with insiders' incentive to sell shares to diversify their portfolio.

Panel A of Table 3.2 presents the correlations between Abnormal Sales Percentage and the above firm- or issue- specific characteristics at the time of the SEO. The correlations table shows that firms with higher abnormal sales percentage are associated with higher market to book, higher prior stock returns, longer period since IPO, lower percentage of primary shares in the SEO, and lower book leverage. Such firms are also less likely to be completing the SEO in a hot equity market.

Finally, firm characteristics such as market-to-book ratio, EBITD, size, and R&D may have an impact on its investment, operating, and financing decisions. Panel B of Table 3.2 presents the correlations between Abnormal Sales Percentage and these control variables in the multiple regressions in my analyses. Given the low correlations among the key variable, Abnormal Sales Percentage, and the above control variables, there exists no indication of potential multicolinearity problem.

To control for the effects of the above variables in the analyses of how firms' pre-issue insider trading is associated with their investment, operating, and financing decisions subsequently, I include these variables in the multivariate regressions. Furthermore, to control for differences in financing and other corporate decisions across time and across industries, I include year dummies as well as industry dummies based on the forty-eight industries categorization in Fama and French (1997) in the regressions.[24]

5.2. Financing Decisions in the Year of the SEO

As discussed previously, an important implication of equity market timing is that market timers issue more equity than they need. In this sub-section, I examine whether

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[24] Coefficient estimates for the year dummies and industry dummies are subsided from the tables.

the amount of equity issues and the amount of debt issues in the year of the SEO are related to insider trading prior to SEOs, controlling for other firm characteristics.

The regression of net equity issues is reported in the first row in Table 3.3. Controlling for other firm characteristics associated with amount of external financing needs, SEO firms with more abnormal insider sales issue significantly more equity. This evidence is consistent with the hypothesis that such firms are more likely to be market timers.

Consistent with findings from the previous literature, the regression of net equity issues shows that the pre-issue market-to-book ratio is positively associated with the amount of equity issue in the SEO. As discussed previously, the evidence could be consistent with that the market-to-book ratio proxies for market timing opportunities or that this ratio is related to growth opportunities. Nevertheless, given that the market-to-book ratio is one of the control variables in the regression, the association between pre-issue insider trading and amount of equity issuance is not driven by effects associated with the market-to-book ratio.

The regression of net equity issues also shows that the pre-issue stock price run-up is positively associated with the amount of equity issue in the SEO. As discussed previously, pre-issue stock returns could be associated with a firm's growth opportunities, market timing opportunities, or insiders' needs to diversity their portfolios. Given that pre-issue stock price run-up is controlled for in the regression, the association between pre-issue insider trading and amount of equity issuance is not driven by the effects associated with pre-issue stock returns.

In addition to net equity issues, I also examine the net debt issues in the year of the SEO. Results are reported in the second row in Table 3.3. The evidence suggests that SEO firms with more abnormal insider sales issue a lower amount of debt in the year of

the SEO. This finding is not surprising because insider trading of stock shares should be more related to insiders' perception of equity values rather than that of debt values. Given insiders' belief of good equity market timing opportunities, they may engage more in the equity market and less in the debt market. In contrast, interestingly, the coefficient on pre-issue market-to-book ratio in the regression of net debt issues is significantly positive, which suggests that firms with a high market-to-book ratio not only issue more equity but also issue more debt. This finding is consistent with that higher market-to-book ratio is associated with better growth opportunities and a greater need of all types of external financing.

5.3. Usage of proceeds from the SEO

There could be several alternative explanations why SEO firms with more abnormal insider sales issue more equity. One explanation is that, as hypothesized in this essay, SEO firms with more abnormal insider sales are more likely to be market timers and they issue more equity than they need to take advantage of over-valued shares. An alternative explanation is that such issuers are more likely to be growth firms that require more external equity financing. Another alternative explanation is that on average such issuers are more likely to be over-levered prior to the SEO and they issue more equity to revert to their target capital structures. This sub-section examines the first alternative explanation, and sub-section 5.5 provides tests to address the second alternative explanation.

To understand whether SEO firms with more abnormal inside sales issue more equity to take advantage of the market timing opportunities or to fund good investment opportunities, it is important to examine the usage of proceeds from the SEO. If the additional proceeds are used to make capital investments, then the evidence is consistent

with the growth opportunities hypothesis; if the additional proceeds are held as cash or paid out as dividends, then the evidence is consistent with the market timing hypothesis. To examine the relation between pre-issue insider trading and the usage of proceeds from the SEO, I run the regressions of change in cash balance, change in dividend, and the amount of investments on abnormal insider sales and control variables. The results are presented in the last three rows in Table 3.3.

The evidence suggests that SEO firms with more abnormal insider sales hold more proceeds in cash in the year of the SEO.[25] In addition, such SEO firms increase dividend payouts significantly more in the year of the SEO. On the other hand, they are not significantly different from others in the amount of capital investments in the year of the SEO. These findings suggest that SEO firms with abnormal insider sales do not issue more equity to fund investment projects or growth opportunities in the year of the SEO.

Table 3.3 also shows how firms with different market-to-book ratio differ in change in cash balance, change in dividends, and the amount of investments in the year of the SEO. While SEO firms with a higher market-to-book ratio put more proceeds in cash balance, such firms have significantly more reduction in dividend payouts and significantly higher amount of capital investments in the year of the SEO. The findings on dividends and investments suggest that firms with a high market-to-book ratio are more likely to issue equity to fund good growth opportunity, rather than to take advantage of the equity market.

One may argue that the finding that SEO firms with more abnormal insider sales do not invest more in the SEO year does not necessarily indicate that they are less likely

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[25] A potential explanation for the evidence on the change in cash balance, alternative to the market timing hypothesis, is that SEO firms with more abnormal insider sales are more likely to be firms that were short of cash and issued equity to increase their cash balances. Unreported results do not support this alternative explanation. First, the correlation between abnormal insider sales and pre-SEO change in cash balance is positive 0.03; second, the coefficient of abnormal insider sales remains statistically significant after adding pre-SEO change in cash balance as a regressor, and the coefficient of pre-SEO change in cash balance is statistically insignificant.

to be growth firms, because it may take time for growth firms to make capital investments and they may hold the proceeds in cash for a while and make investments gradually. To address this concern, I examine change in cash balance and the amount of investments in the three years following the SEO. Results are presented in Table 3.4. The evidence suggest that SEO firms with more abnormal insider sales do not reduce their cash balances or invest more heavily in the years following the SEO. Therefore, the evidence is not consistent with the hypothesis that such SEO firms are growth firms that gradually use the proceeds from the SEO to make capital investments.

Table 3.4 also shows how pre-issue market-to-book ratio is associated with the change in cash balance and the amount of capital investments in the years following the SEO. The coefficients of the market-to-book ratio are significantly positive up to three years subsequent to the SEO. In other words, SEO firms with a higher market-to-book ratio are more likely to use more proceeds to make capital investments. In addition, there is evidence that such firms reduce their cash balance more in the second year following the SEO. These findings are consistent with that SEO firms with a high market-to-book ratio are associated with good investment opportunities. Such evidence indicates the problem of the previous studies that use the market-to-book ratio as a proxy for market timing, as discussed previously.

In addition, Table 3.4 shows how pre-issue stock price run-up is associated with the change in cash balances and the amount of capital investments subsequent to the SEO. Evidence suggests that firms with higher pre-issue stock returns significantly increase cash balances in the SEO year. However, such firms significantly reduce cash balances in the third year following the SEO and make significantly more investments following the SEO. Such evidence is consistent with that SEO firms with higher pre-issue stock returns are more likely to be growth firms.

To summarize the findings on the association between insider trading and the usage of proceeds, SEO firms with more abnormal insider sales issue more equity in the SEO and subsequently, hold more cash, and increase dividend payouts more, and they do not invest more heavily. These findings suggest that SEO firms with more abnormal insider sales are more likely to issue seasoned equity to time the equity market, rather than to fund growth opportunities.

5.4. Operating Performance

To examine how pre-issue insider trading is associated with post-SEO operating performance, I run regressions of EBITD in each of the five years subsequent to the SEO on abnormal insider sales and control variables. Results are reported in Table 3.5.

Controlling for other firm characteristics, I find evidence that SEO firms with more abnormal insider sales have worse operating performance in year three after the SEO. This finding is consistent the hypothesis that SEO firms with more abnormal insider sales are more likely to be timing the market. In addition, the fact that such firms do not perform better than others suggests that they do not issue more equity to fund good growth opportunities.

Table 3.5 also shows the association between the pre-issue market-to-book ratio and subsequent operating performance. The coefficient estimate of the market-to-book ratio prior to the SEO is significantly positive in the year of the SEO and in the subsequent year; the coefficient is also significantly positive in the fifth year following the SEO. The positive association between pre-issue market-to-book ratio and post-issue operating performance suggests that SEO firms with a higher market-to-book ratio are more likely to be growth firms. Such evidence indicates the problem of the previous

studies that use the market-to-book ratio at the time of the equity issuance as a proxy for market timing opportunities.

In addition, Table 3.5 shows the association between pre-issue stock price run-up and post-issue operating performance. In the two years subsequent to the SEO, firms with higher pre-issue stock returns have better operating performance. This is consistent with the hypothesis that SEO firms with higher pre-issue stock returns are more likely to be growth firms.

To summarize, the findings on post-issue operating performance is consistent with the hypothesis that SEO firms with more abnormal insider sales are more likely to issue seasoned equity to time the equity market, while SEO firms with a higher pre-issue market-to-book ratio or stock price run-up are more likely to be growth firms.

5.5. Capital Structure

As discussed previously, the literature on the persistency of market timing effects on capital structure provides mixed findings. Using pre-issue insider trading as a proxy for market timing opportunities at the time of the SEO, I examine whether the market timers are different in changes in capital structures from other SEO firms. Specifically, I study how pre-issue insider trading is related to the level of leverage, the changes in leverage, and the amount of equity issues and debt issues in the years around the SEO.

As a first step, I examine whether SEO firms with more abnormal insider sales are more levered prior to the SEO. As discussed previously in sub-section 5.3, there are several alternative explanations for why SEO firms with more abnormal insider sales issue more equity. Alternative to the market timing hypothesis, SEO firms with more abnormal insider sales may issue more equity because they are more over-levered prior to the SEO and they issue more equity in the SEO to revert to their target leverage ratios.

To examine this alternative hypothesis, I run a regression of pre-issue leverage ratio on Abnormal Sales Percentage and control variables.

Results of this regression are reported in the first row in Table 3.6. Controlling for other firm characteristics, SEO firms with more abnormal insider sales are significantly less levered in the year prior to the SEO. This evidence is contrary to the hypothesis that such firms issue more equity because they are more over-levered prior to the SEO and they issue more equity to revert to target leverage ratios. Rather, this evidence is consistent with the market timing behavior of such firms; they issue more equity regardless of their comparatively low leverage.

Next, I examine how pre-issue insider trading is associated with capital structure decisions following the SEO.

To examine the relation between capital structure and insider trading in a multivariate setting, I run regression of book leverage on abnormal sales percentage and control variables, for each of the five years following the SEO. Results are reported in the last five rows of Table 3.6.

SEO firms with more abnormal insider sales are less levered in the next a few years, after controlling for various determinants of capital structure. However, the amount of such under-leverage gradually decreases in magnitude and significance level in subsequent years, and becomes insignificant in the third year following the SEO. In other words, following the equity issuance, SEO firms with more abnormal insider sales reverse their capital structures more than SEO firms with less abnormal insider sales. The evidence is consistent with the hypothesis that market timers, or SEO firms with more abnormal insider sales, reverse the effects of market timing on their capital structures gradually subsequent to the SEO.

Evidence on post-issue capital structure decisions can also be provided by examining the cumulative changes or annual changes in leverage. Table 3.7 presents the findings from the regressions of cumulative changes in capital structure. Given the earlier finding that the SEO firms with more abnormal insider sales issue more equity, it is not surprising that the cumulative change in leverage from the year prior to the SEO to the year after the SEO is significantly more negative. However, the cumulative change in capital structure of such firms becomes insignificantly in the third years following the SEO, which suggests that the impact of market timing of such firms on capital structure is reversed within three years.

Table 3.8 presents the findings from the regressions of annual changes in leverage. Consistent with the earlier findings, in the year of the SEO, firms with more abnormal insider sales reduce their leverage more significantly. In addition, there is evidence that such firms subsequently increase leverage significantly more. Specifically, in year five subsequent to the SEO, such firms have a significantly positive change in leverage, controlling for other determinants of capital structure. Such increase in leverage would help these firms to reverse the impact of market timing on their capital structure. In contrast, there is no evidence that firms with a higher pre-issue market-to-book ratio increase leverage more significantly in the years subsequent to the SEO.

Finally, to further investigate whether pre-issue insider trading activity is associated with how firms actively reverse the effects of the SEO on their capital structures, I examine the amount of net debt issues and net equity issues in multivariate regressions. Results of these regressions are presented in Table 3.9 and Table 3.10. Table 3.10 provides evidence that SEO firms with more abnormal insider sales issue less equity in year five following the SEO.

To summarize, the evidence suggests that SEO firms with more abnormal insider sales, who are more likely to be market timers, gradually reverse the effects of the SEO on their capital structures in the following years. There is some evidence that such firms issue significantly less equity subsequent to the SEO.

6. ROBUSTNESS CHECKS

6.1. Hot Market Effects

As discussed previously, Alti (2006) uses equity market volume as a proxy for aggregate market timing opportunities, and finds evidence that IPOs completed in hot equity markets are more likely to be market timers and IPOs completed in cold equity market are more likely to be growth firms. The hot and cold equity market classification captures variations in market-wide timing opportunities. The advantage of this aggregate market timing measure is that it is isolated from confounding effects of other idiosyncratic determinants of financing policy at the firm level. However, this market-wide timing measure is not designed to capture idiosyncratic variations in market timing opportunity across firms, unlike the insider trading measures developed in this essay.

To make sure that the findings in the main analyses are not driven by the hot market effects documented by Alti (2006), I run the multivariate regressions in the main analyses on Abnormal Sales Percentage, a Hot Market dummy variable, and other control variables. The Hot Market Dummy equals one for SEOs completed in hot equity markets and zero for other SEOs. Following Alti (2006), hot equity markets are defined based on aggregate monthly volume of equity issues.[26]

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[26] See Alti (2006) for detailed definition for hot markets and cold markets.

Table 3.11 reports the results of the regressions controlling for hot market effects. Consistent with the findings from the main analyses, SEO firms with more abnormal insider sales issue more equity and less debt in the year of the SEO. They hold more proceeds in cash balance and pay out more dividends at the same time. They do not invest more heavily in the year of the SEO. Subsequent to the SEO, they do not reduce the amount of cash held or invest more heavily. In addition, such SEO firms have worse operating performance in the third year following the SEO. Finally, the evidence on book leverage and cumulative changes in book leverage suggests that such firms gradually reverse the effects of SEO on their capital structures in the following years. There is also evidence that SEO firms with more pre-issue abnormal insider sales issue significantly less equity in year five following the SEO.

Table 3.11 also provides evidence on the real activities of firms that issue seasoned equity in a hot equity. Controlling for the level of pre-issue abnormal insider sales and other firm characteristics, SEO issuers in hot equity markets issue more equity than other issuers, which is consistent with the findings from a sample of IPO firms in Alti (2006). However, hot market SEO firms do not hold more proceeds in cash or have more dividend payments in the year of the SEO, and they do reduce their cash balances in the years following the SEO. Finally, these SEO firms issue less debt in the fifth year and less equity in the first and third year following the SEO.

To summarize, the findings in this sub-section suggest that the evidence in this study are robust after controlling for the hot market effects. In addition, the evidence suggests that controlling for pre-issue insider trading activity, the hot market effects are not as strong for the SEO firms in the sample of this essay as for the IPO firms in the sample examined by Alti (2006).

6.2. Alternative Measurers of Insider Trading

In the main analyses, I measure pre-issue insider trading by the level of abnormal insider sales occurred in the six months prior to the issue date of the SEO, adjusted for the historical level of insider sales. In this sub-section, I examine whether the findings in the main analyses are robust to alternative measures of pre-issue insider trading.

6.2.1. Insider Trades Measured by SEC Receipt Date

In the main analyses, insider trades are measured by transaction date and summarized in the six months prior to the SEO. In this sub-section, I measure insider trades by the report date (SEC Receipt Date) rather than the transaction date, and examine whether the results in the main analyses are robust to this alternative measure of insider trading. Insider trades captured by this measure are publicly known at the time of the SEO.

I construct Abnormal Sales Percentage by SEC Receipt Date, a variable that equals the percentage of insider sales reported in the six months prior to the SEO, minus the average percentage of insider sales reported in the year starting at two years prior to the SEO. An un-tabulated test suggests that the Abnormal Sales Percentage by SEC Receipt Date is highly correlated with the Abnormal Sales Percentage by the transaction date used in the main analyses. The correlation between these two variables is 0.91.

As a robustness test, I perform the regressions in the main analyses on the Abnormal Sales Percentage by SEC Receipt Date and control variables. Table 3.12 presents the findings. Consistent with the findings in the main analyses, firms with more abnormal insider sales issue more equity and issue less debt in the year of the SEO. They are associated with more dividend payout and increase in cash balance, and they do not use the proceeds from the SEO to make more capital investments. Finally, following the

SEO, the impact of the equity issuance on their capital structure gradually reverses. There exists evidence that such firms issue less equity in year five following the SEO.

6.2.2. Abnormal Sales Percentage Adjusted for Firm Characteristics and Firm Fixed Effects

Insiders may trade for reasons other than private information on firm value. This is especially important for my study because equity issuance usually follows a large stock price run-up, which increases the insiders' wealth in their own company. In addition, it is possible that there exist unobservable firm characteristics that are potentially associated with the expected level of insider sales. In the multivariate regressions in the main analyses, I do control for prior stock price run-up, a variable that might be associated with insiders' diversification need. I also control for firm characteristics such as size, the market-to-book ratio, and days since IPO, which are variables that might be associated with insiders' incentive to sell. Nevertheless, to further control for the potential heteroskadasticity of insider trading activities across firms that are not related to the insiders' perception of firm value, I construct a measure of abnormal insider trading by running a regression of percentage of insider sales on firm characteristics such as pre-issue stock run-up, the market-to-book ratio, and firm size, controlling for firm fixed effects. Residuals from this regression, the Abnormal Sales Percentage adjusted for firm characteristics and firm fixed effects, are taken as an alternative measure of abnormal insider sales.

As a robustness check, I perform the regressions specified in the main analyses using this alternative abnormal insider sales measure adjusted for firm characteristics and fixed effects. Table 3.13 presents the findings using this alternative measure of insider trading. Consistent with the findings from the main analyses, firms with more abnormal insider sales issue more equity in the year of the SEO. They use the extra proceeds to

increase cash balance, rather than making more capital investments. In addition, these firms have worse operating performance in the second and third year following the SEO.

6.2.3. Pure Insider Sales

In this sub-section, I measure insider trading by the level of insider sales rather than the abnormal level of insider sales. Following Lee (1997), I categorize the SEO firms in the sample by insider trading activities prior to the issue date into the following groups: (1) SEO firms with pure insider sales, or issuers with all trades by top executives being sales during the six months prior to the SEO; (2) other SEO firms. To the extent that consensus among insiders conveys the strongest signal of consistent inside information about the firm value, SEO firms with uniform insider sales are more likely to be reliably associated with insider's perception of over-valuation of stock price. I define Pure Insider Sales as a dummy that equals one for the first group of SEO firms and zero for the second group, and examine the difference in investment, operating, and financing decisions between these two groups in multivariate regressions.

Table 3.14 presents the findings of the regressions on the Pure Insider Sales dummy and control variables. Consistent with the findings from the main analyses, SEO firms with pure insider sales issue more equity and less debt in the year of the SEO. They significantly increase cash balance in the year of the SEO and do not reverse it in later years. They do not invest more than other firms.

7. CONCLUSION

Insiders of SEO firms have private information about the firms' value and future prospects, and they could use this private information to trade their own shares prior to

SEOs. This essay examines how insider trading activity prior to SEOs is related to subsequent investment, operating and financing decisions of the issuer.

I find that SEO firms with more abnormal insider sales issue more seasoned equity. Such firms do not make more investments; rather, they hold the extra proceeds in cash balance and increase dividend payouts more. There also exists weak evidence that such firms tend to have worse operating performance and they issue less equity subsequently to reverse the effects of equity issuance on their capital structures.

These findings suggest that insiders have superior information about the firm value and they use this information to time both personal trades and public equity offerings. Insider trading activity prior to SEOs provides valuable information about the firms' incentives to issue seasoned equities. In addition, insider information about the issuer's valuation not only influences the firm's decision to issue seasoned equity, but also has an impact on the firm's real activities following the SEO. Pre-issue Insider trading activity helps predict subsequent investment, operating, and financing decisions of the issuer.

Tables

Table 2.1:   Summary Statistics

Panel A presents the number of firm-year observations, mean and standard deviation of the main variables. Level of capital investments is measured by the amount of capital expenditures divided by sales. Panel B presents the distribution of the Entrenchment Index. Panel C presents the correlation between the main variables. The level of abnormal capital investments is calculated as the difference between the level of actual and expected capital investments, where the level of expected capital investments of a firm in a given year is calculated as the average level of its capital investments in the past three years. Panel D presents the mean value of the key variables for firms in the low, middle, and high entrenchment groups, and the difference between the low and high entrenchment groups. *, **, and *** represent significance level at 0.10, 0.05, and 0.01, respectively.

Panel A: Number of observations, Mean and Standard Deviation of Variables:

	Number of Firm-Year Observations	MEAN	STD
Market Equity (in Millions)	20,862	5,486	19,953
Total Assets (in Millions)	20,872	10,017	45,095
Sales (in Millions)	20,841	4,077	11,198
Market to Book	18,896	1.75	1.28
Capital Investments	19,105	8.54%	15.9%
Entrenchment Index	20,875	2.08	1.34

Panel B: Distribution of Entrenchment Index:

Entrenchment Index	Frequency of Firm-Year Observations	Percent	Entrenchment Index Group	Percent
0	3,066	14.7%	Low	34.4%
1	4,124	19.8%		
2	5,433	26.0%	Middle	26.0%
3	5,134	24.6%		
4	2,529	12.1%	High	39.5%
5	519	2.5%		
6	70	0.3%		
Total number of firm-year observations	20,875	100.00%		100.00%

Table 2.1:   Summary Statistics (Continued)

Panel C: Correlation Coefficients of Variables.

	Capital Inv.	Abn. Cap. Inv.	Market Equity	Market to Book	Total Assets	Sales	E Index
Capital Investments	1.000						
Abnormal Capital Investments	0.301	1.000					
Market Equity	-0.006	0.009	1.000				
Market to Book	-0.008	0.000	0.255	1.000			
Total Assets	-0.024	0.006	0.492	-0.045	1.000		
Sales	-0.040	0.011	0.663	0.009	0.530	1.000	
Entrenchment Index	-0.003	0.014	-0.103	-0.093	-0.074	-0.097	1.000

Panel D: Entrenchment Index and Firm Characteristics:

Entrenchment Index Group	Market Equity (in Millions)	Market to Book	Total Assets (in Millions)	Sales (in Millions)	Capital Investments	Abnormal Capital Investments
Low	8,035	1.87	15,125	5,454	8.51%	-0.95%
Middle	4,550	1.79	6,775	3,641	8.86%	-0.97%
High	3,879	1.63	7,700	3,164	8.36%	-0.56%
Difference: Low -High	4,156 ***	0.24 ***	7,425 ***	2,290 ***	0.15%	-0.39% **

Table 2.2:   Regression of Capital Investment on the Entrenchment Index

This table presents the regressions of the level of capital investments and the level of abnormal capital investments on the Entrenchment Index, and other firm characteristics including lagged market-to-book ratio, lagged book leverage, lagged cash, firm age, lagged firm size, past stock performance, and lagged capital investments. Regressions are clustered at firm level. Industry Dummies and year dummies are included in the regressions (coefficients on these dummy variables are suppressed from the table). The t-statistics, reported in italics, are robust to heteroskedasticity and within cluster correlation. *, **, and *** represent significance level at 0.10, 0.05, and 0.01, respectively.

| Independent Variable | Dependent Variable: | | | |
| | Capital Investment | | Abnormal Capital Investment | |
	Parameter Estimates	*T Statistics*	Parameter Estimates	*T Statistics*
Entrenchment Index	0.002 ***	*3.785*	0.002 ***	*3.277*
Market-to-book Ratio	0.002 ***	*2.856*	0.004 ***	*2.932*
Book Leverage	-0.020 ***	*-5.345*	-0.039 ***	*-5.547*
Cash	0.019 *	*1.668*	0.003	*0.201*
Firm Age	0.000	*-0.536*	0.000 ***	*5.650*
Firm Size	0.000	*1.265*	0.000 ***	*2.819*
Past Stock Performance	-0.003	*-1.470*	-0.007 ***	*-3.273*
Lagged Capital Investment	0.668 ***	*24.665*	-0.184 ***	*-4.309*
R square	0.64		0.07	

Table 2.3:   Stock Performance and Capital Investments, and Stock Performance and
Corporate Governance

Panel A presents the mean monthly abnormal stock returns for different quintiles of abnormal capital investments. Panel B presents the mean monthly abnormal stock return for different groups of the Entrenchment Index. Abnormal stock return of an individual stock is calculated following Daniel, Grinblatt, Titman, and Wermers (1997). The numbers in the table are in percentage. *, **, and *** represent a significant difference at 0.10, 0.05, and 0.01 significance levels, respectively.

Panel A:

Abnormal Capital Investment	Abnormal Stock Return
Lowest 1	0.215
2	0.141
3	-0.093
4	-0.140
Highest 5	-0.014
Difference 1,2 - 4,5	0.255 **

Panel B:

Entrenchment Index Group	Abnormal Stock Return
Low	0.082
Middle	-0.017
High	-0.062
Low-High	0.144 *

Table 2.4:   Stock Performance, Capital Investments and Corporate Governance

This table presents the mean monthly abnormal stock return for different quintiles of abnormal capital investments and different groups of the Entrenchment Index. Abnormal stock return is calculated following Daniel, Grinblatt, Titman, and Wermers (1997). Abnormal stock return of an individual stock is calculated following Daniel, Grinblatt, Titman, and Wermers (1997). The numbers in the table are in percentage. *, **, and *** represent a significant difference at 0.10, 0.05, and 0.01 significance levels, respectively.

Abnormal Stock Return		Entrenchment Index Group			
		Low	Middle	High	Difference: Low - High
Abnormal Capital Investment	Lowest 1	0.328	0.046	0.214	0.081
	2	0.153	0.130	0.044	
	3	-0.042	-0.167	-0.093	0.025
	4	-0.143	-0.008	-0.318	0.256 *
	Highest 5	0.149	-0.075	-0.129	
	Difference 1,2 - 4,5	0.237	0.129	0.353 ***	

Table 2.5:   Regression Results for Portfolios Formed on Capital Investment and
             Corporate Governance

This table presents the coefficient estimates from the regressions of monthly abnormal returns of different portfolios constructed based on the abnormal capital investment quintiles and the Entrenchment Index groups on the Carhart (1997) four factors: $R_{p,t} = \alpha_p + \beta_{MKT,p} (R_{MKT,t} - R_{f,t}) + \beta_{SMB,p} R_{SMB,t} + \beta_{HML,p} R_{HML,t} + \beta_{PR1YR,p} R_{PR1YR,t} + \varepsilon_{p,t}$. Abnormal stock return of an individual stock in the portfolio is calculated as its stock return minus the weighted average returns of its benchmark firms based on Daniel, Grinblatt, Titman, and Wermers (1997). The alphas reported in the table are in percentage. *, **, and *** represent significance level at 0.10, 0.05, and 0.01, respectively.

Independent Variable	Dependent Variable: Monthly Abnormal Stock Returns for Portfolios based on the Abnormal Capital Investment Quintile and the Entrenchment Index Group					
	Abnormal Capital Investment $(1,2 - 4,5)$ E = Low	Abnormal Capital Investment $(1,2 - 4,5)$ E = Middle	Abnormal Capital Investment $(1,2 - 4,5)$ E = High	E (Low-High) Abnormal Capital Investment = 1,2	E (Low-High) Abnormal Capital Investment = 3	E (Low-High) Abnormal Capital Investment = 4,5
α_p	0.287	0.177	0.283 **	0.344	0.080	0.347 **
	1.253	0.905	2.106	1.506	0.521	2.063
$\beta_{MKT,p}$	-8.969	2.499	-5.016	-3.960	5.702	2.513
	-1.481	0.399	-1.246	-0.604	1.379	0.511
$\beta_{SMB,p}$	8.010	7.959	2.762	5.776	-17.562 ***	4.241
	1.254	1.347	0.700	0.976	-3.895	0.726
$\beta_{HML,p}$	-19.176 **	-11.465	6.344	-36.098 ***	-14.511 **	-0.036
	-2.290	-1.402	1.170	-4.560	-2.599	-0.006
$\beta_{PR1YR,p}$	9.227	-2.793	6.900 *	-7.689	5.348	-12.771 ***
	1.371	-0.366	1.931	-1.193	1.436	-2.609

Table 2.6:   Earnings Announcement Returns and Capital Investments, and Earnings
            Announcement Returns and Corporate Governance

Panel A presents the mean cumulative abnormal earnings announcement returns for different quintiles of abnormal capital investments. Panel B presents the cumulative abnormal earnings announcement returns for different groups of the Entrenchment Index. Cumulative earnings announcement return is calculated as the twelve-day cumulative stock return centered at the four quarterly earnings announcements dates (day minus one to day plus one around each announcement) in the year after the portfolio formation. The cumulative abnormal earnings announcement return of an individual stock is calculated as the difference between the cumulative earnings announcement return of the stock and that of its Daniel, Grinblatt, Titman, and Wermers (1997) benchmark portfolio. The numbers in the table are in percentage. *, **, and *** represent a significant difference at 0.10, 0.05, and 0.01 significance levels, respectively.

Panel A:

Abnormal Capital Investment	Cumulative Abnormal Earnings Announcement Return
Lowest 1	0.086
2	0.574
3	-0.412
4	0.511
Highest 5	-0.124
Difference 1,2 - 4,5	0.137

Panel B:

Entrenchment Index Group	Cumulative Abnormal Earnings Announcement Return
Low	0.055
Middle	0.608
High	-0.273
Low-High	0.328

Table 2.7:   Earnings Announcement Returns, Capital Investments and Corporate
              Governance

This table presents the mean annual cumulative abnormal earnings announcement returns for different quintiles of abnormal capital investments and different groups of the Entrenchment Index. Cumulative earnings announcement return is calculated as the twelve-day cumulative stock return centered at the four quarterly earnings announcements dates (day minus one to day plus one around each announcement) in the year after the portfolio formation. The cumulative abnormal earnings announcement return of an individual stock is calculated as the difference between the cumulative earnings announcement return of the stock and that of its Daniel, Grinblatt, Titman, and Wermers (1997) benchmark portfolio. The numbers in the table are in percentage. *, **, and *** represent a significant difference at 0.10, 0.05, and 0.01 significance levels, respectively.

Cumulative Abnormal Earnings Announcement Return		Entrenchment Index Group			
		Low	Middle	High	Difference: Low - High
Abnormal Capital Investment	Lowest 1	0.268	-0.317	0.162	0.512
	2	1.077	0.023	0.160	
	3	-0.698	-0.347	0.509	-1.206
	4	0.739	1.427	1.025	1.042*
	Highest 5	-0.468	2.176	-0.789	
	Difference 1,2 - 4,5	0.537	-1.949 **	1.068 *	

Table 2.8:   Sub-period Test: July 1991 to June 1999

This table presents the mean monthly abnormal stock return for different quintiles of abnormal capital investments and different groups of the Entrenchment Index, for the sub-period of July 1991 to June 1999.

Panel A:

Abnormal Capital Investment	Abnormal Stock Return
Lowest 1	0.105
2	0.241
3	-0.062
4	-0.214
Highest 5	-0.122
Difference 1,2 - 4,5	0.341 ***

Panel B:

Entrenchment Index Group	Abnormal Stock Return
Low	0.108
Middle	-0.084
High	-0.102
Low-High	0.210 **

Panel C:

Abnormal Stock Return		Entrenchment Index Group			Difference: Low - High
		Low	Middle	High	
	Lowest 1	0.162	-0.254	0.349	0.136
	2	0.309	0.213	-0.022	
Abnormal Capital Investment	3	0.035	-0.114	-0.146	0.180
	4	-0.199	-0.198	-0.340	0.342 *
	Highest 5	0.150	-0.404	-0.260	
	Difference 1,2 - 4,5	0.260	0.281	0.463 ***	

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Table 2.9:   Sub-period Test: July 1999 to June 2006

This table presents the mean monthly abnormal stock return for different quintiles of abnormal capital investments and different groups of the Entrenchment Index, for the sub-period of July 1999 to June 2006.

Panel A:

Abnormal Capital Investment	Abnormal Stock Return
Lowest 1	0.341
2	0.027
3	-0.127
4	-0.055
Highest 5	0.109
Difference 1,2 - 4,5	0.158

Panel B:

Entrenchment Index Group	Abnormal Stock Return
Low	0.051
Middle	0.061
High	-0.017
Low-High	0.068

Panel C:

Abnormal Stock Return		Entrenchment Index Group			
		Low	Middle	High	Difference: Low - High
Abnormal Capital Investment	Lowest 1	0.516	0.389	0.061	0.018
	2	-0.027	0.034	0.120	
	3	-0.130	-0.228	-0.033	-0.097
	4	-0.079	0.210	-0.293	0.158
	Highest 5	0.147	0.302	0.020	
	Difference 1,2 - 4,5	0.211	-0.044	0.227	

Table 2.10:   Robustness Test: Excluding Equity Issuance Effects 1

This table presents the mean monthly abnormal stock return for different quintiles of abnormal capital investments and different groups of the Entrenchment Index, excluding firms with net equity issuance greater than 10% of their total assets in a given year.

Panel A:

Abnormal Capital Investment	Abnormal Stock Return
Lowest 1	0.126
2	0.244
3	-0.060
4	-0.201
Highest 5	-0.087
Difference 1,2 - 4,5	0.329 ***

Panel B:

Entrenchment Index Group	Abnormal Stock Return
Low	0.116
Middle	-0.071
High	-0.089
Low-High	0.204 **

Panel C:

Abnormal Stock Return		Entrenchment Index Group			Difference: Low - High
		Low	Middle	High	
Abnormal Capital Investment	Lowest 1	0.249	-0.317	0.365	0.172
	2	0.342	0.208	0.004	
	3	0.029	-0.140	-0.079	0.109
	4	-0.204	-0.178	-0.293	0.378 **
	Highest 5	0.203	-0.242	-0.342	
	Difference 1,2 - 4,5	0.296	0.155	0.502 ***	

Table 2.11: Robustness Test: Excluding Equity Issuance Effects 2

This table presents the mean monthly abnormal stock return for different quintiles of abnormal capital investments and different groups of the Entrenchment Index, excluding firms with net equity issuance greater than 5% of their total assets in a given year.

Panel A:

Abnormal Capital Investment	Abnormal Stock Return
Lowest 1	0.155
2	0.195
3	0.003
4	-0.219
Highest 5	-0.065
Difference 1,2 - 4,5	0.317 ***

Panel B:

Entrenchment Index Group	Abnormal Stock Return
Low	0.088
Middle	-0.018
High	-0.077
Low-High	0.165 *

Panel C:

Abnormal Stock Return		Entrenchment Index Group			
		Low	Middle	High	Difference: Low - High
	Lowest 1	0.249	-0.214	0.362	0.124
	2	0.245	0.270	0.024	
Abnormal Capital Investment	3	0.044	-0.028	-0.029	0.072
	4	-0.245	-0.204	-0.284	0.370 **
	Highest 5	0.240	-0.219	-0.336	
	Difference 1,2 - 4,5	0.249	0.240	0.504 ***	

Table 2.12: Robustness Test: Regression of Capital Investment on the Entrenchment
Index as of 1990

This table presents the regressions of the level of capital investments and the level of abnormal capital investments on the Entrenchment Index as of 1990, and other firm characteristics including lagged market-to-book ratio, lagged book leverage, lagged cash, firm age, lagged firm size, past stock performance, and lagged capital investments. Regressions are clustered at firm level. Industry Dummies and year dummies are included in the regressions (coefficients on these dummy variables are suppressed from the table). The t-statistics, reported in italics, are robust to heteroskedasticity and within cluster correlation. *, **, and *** represent significance level at 0.10, 0.05, and 0.01, respectively.

| Independent Variable | Dependent Variable: | | | |
| | Capital Investment | | Abnormal Capital Investment | |
	Parameter Estimates	*T Statistics*	Parameter Estimates	*T Statistics*
Entrenchment Index as of 1990	0.002 ***	*3.176*	0.002 ***	*2.926*
Market-to-book Ratio	0.003 ***	*3.660*	0.003 ***	*4.464*
Book Leverage	-0.017 ***	*-3.017*	-0.018 **	*-2.356*
Cash	-0.007	*-0.789*	0.008	*0.895*
Firm Age	0.000	*-0.361*	0.000 ***	*2.813*
Firm Size	0.000	*0.388*	0.000	*-0.330*
Past Stock Performance	-0.002	*-1.086*	-0.005 *	*-1.942*
Lagged Capital Investment	0.660 ***	*14.617*	-0.143 ***	*-2.713*
R square	0.60		0.04	

Table 2.13: Robustness Test: Entrenchment Index of 1990 as Measure of Corporate Governance

This table presents the mean monthly abnormal stock return for different quintiles of abnormal capital investments and different groups of the Entrenchment Index (according to the value of the Entrenchment Index as of 1990).

Panel A:

Abnormal Capital Investment	Abnormal Stock Return
Lowest 1	0.105
2	0.241
3	-0.062
4	-0.214
Highest 5	-0.122
Difference 1,2 - 4,5	0.341
	***

Panel B:

Entrenchment Index Group as of 1990	Abnormal Stock Return
Low	0.092
Middle	-0.127
High	-0.022
Low-High	0.114

Panel C:

Abnormal Stock Return		Entrenchment Index Group as of 1990			
		Low	Middle	High	Difference: Low - High
	Lowest 1	0.124	-0.169	0.229	0.043
	2	0.245	0.119	0.169	
	3	0.074	-0.187	-0.032	0.105
Abnormal Capital Investment	4	-0.228	-0.222	-0.326	0.302 *
	Highest 5	0.112	-0.481	-0.215	
	Difference 1,2 - 4,5	0.243	0.327	0.470	
			*	***	

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Table 2.14: Robustness Test: Industry Adjusted Abnormal Capital Expenditure

This table presents the mean monthly abnormal stock return for different quintiles of industry adjusted abnormal capital investments and different groups of the Entrenchment Index.

Panel A:

Industry Adjusted Abnormal Capital Investment	Abnormal Stock Return
Lowest 1	-0.093
2	0.070
3	-0.004
4	0.044
Highest 5	-0.171
Difference 1,2 - 4,5	0.052

Panel B:

Entrenchment Index Group	Abnormal Stock Return
Low	0.108
Middle	-0.084
High	-0.102
Low-High	0.210 **

Panel C:

Abnormal Stock Return		Entrenchment Index Group			Difference: Low - High
		Low	Middle	High	
Industry Adjusted Abnormal Capital Investment	Lowest 1	-0.162	0.039	-0.060	0.051
	2	0.175	-0.076	0.022	
	3	0.057	-0.114	-0.055	0.112
	4	0.278	-0.218	-0.184	0.542 **
	Highest 5	0.087	-0.427	-0.404	
	Difference 1,2 - 4,5	-0.176	0.304	0.275	

Table 2.15:   Robustness Test: Characteristics Adjusted Abnormal Capital Expenditure

This table presents the mean monthly abnormal stock return for different quintiles of characteristics adjusted abnormal capital investments and different groups of the Entrenchment Index.

Panel A:

Characteristics Adjusted Abnormal Capital Investments	Abnormal Stock Return
Lowest 1	-0.014
2	0.075
3	-0.005
4	-0.197
Highest 5	-0.007
Difference 1,2 - 4,5	0.132

Panel B:

Entrenchment Index Group	Abnormal Stock Return
Low	0.108
Middle	-0.084
High	-0.102
Low-High	0.210 **

Panel C:

Abnormal Stock Return		Entrenchment Index Group			Difference: Low - High
		Low	Middle	High	
	Lowest 1	0.181	-0.247	-0.369	0.103
	2	0.015	0.001	0.347	
Characteristics Adjusted Abnormal Capital Investments	3	0.177	-0.236	0.013	0.164
	4	-0.220	-0.229	-0.174	0.344 *
	Highest 5	0.160	-0.017	-0.327	
	Difference 1,2 - 4,5	0.129	0.000	0.239	

Table 2.16: Robustness Check: Capital Expenditure and Mergers & Acquisitions

This table presents the mean monthly abnormal stock return for different quintiles of abnormal capital investments and different groups of the Entrenchment Index. Capital investments include both capital expenditures and mergers and acquisitions.

Panel A:

Abnormal Capital Investment	Abnormal Stock Return
Lowest 1	-0.048
2	0.068
3	-0.092
4	-0.126
Highest 5	0.072
Difference 1,2 - 4,5	0.037

Panel B:

Entrenchment Index Group	Abnormal Stock Return
Low	0.108
Middle	-0.084
High	-0.102
Low-High	0.210 **

Panel C:

Abnormal Stock Return		Entrenchment Index Group			Difference: Low - High
		Low	Middle	High	
	Lowest 1	0.057	-0.445	0.173	0.170
	2	0.174	-0.045	-0.044	
	3	0.095	-0.305	-0.351	0.447 *
Abnormal Capital Investment	4	0.011	-0.177	-0.354	0.498 ***
	Highest 5	0.256	0.083	-0.163	
	Difference 1,2 - 4,5	-0.018	-0.198	0.323 *	

Table 3.1:   Insider Trading Patterns Prior to SEOs

Panel A reports the mean and standard deviation of number of insider trades (sales and purchases respectively) in each six-month period in the four years prior to SEOs. Panel B reports the level and t statistic of change of insider trades (sales and purchases respectively) from the Months (-12, -7) to the months (-6, -1).

Panel A

Month	Number of Insider Sales		Number of Insider Purchases	
	Mean	Standard Deviation	Mean	Standard Deviation
(-48, -43)	3.3	7.9	2.0	5.1
(-42, -37)	3.0	8.2	2.1	5.7
(-36, -31)	3.4	8.9	1.9	4.2
(-30, -25)	3.2	11.0	2.1	4.8
(-24, -19)	3.2	8.0	2.2	4.9
(-18, -13)	3.3	9.3	2.1	5.2
(-12, -7)	4.5	10.6	2.0	4.2
(-6, -1)	7.4	19.4	1.2	3.2

Panel B

Month	Change in Number of Insider Sales		Change in Number of Insider purchases	
	Mean	T stat	Mean	T stat
(-12, -7) to (-6,-1)	2.7	6.8	-0.9	-10.0

Table 3.2:   Correlation Coefficients

Panel A reports the correlation coefficients between Abnormal Sales Percentage and firm characteristics at the time of the SEO, including Market-to-book, Prior stock return, Days since IPO, Percentage of primary shares offered in the SEO, Hot Equity Market Dummy (which equals 1 if an SEO is completed in a hot equity market), and Book Leverage. Panel B reports the correlation coefficients between the Abnormal Sales Percentage and key variables in the multiple regressions, including lagged Market-to-book, lagged EBITD, lagged Size, lagged PPE, lagged R&D, and lagged RDD dummy (which equals 1 if lagged R&D value is missing).

Panel A: Correlation between Abnormal Sales Percentage and firm characteristics at the time of the SEO.

Correlation Coefficients	Abnormal Sales Percentage	Market to Book prior to SEO	Prior Stock Return	Days Since IPO	Primary Shares Percentage	HOT Equity Market	Book Leverage prior to SEO
Abnormal Sales Percentage	1.000						
Market to Book prior to SEO	0.151	1.000					
Prior Stock Return	0.041	0.154	1.000				
Days Since IPO	0.265	-0.293	0.087	1.000			
Primary Shares Percentage	-0.054	-0.057	0.057	0.228	1.000		
HOT Equity Market	-0.031	0.156	0.200	-0.132	-0.021	1.000	
Book Leverage prior to SEO	-0.147	-0.448	-0.059	0.167	0.026	-0.086	1.000

Panel B: Correlation between Abnormal Sales Percentage and key variables in the multiple regressions.

Correlation Coefficients	Abnormal Sales Percentage	Lag MtoB	Lag EBITD	Lag Size	Lag PPE	Lag RandD	LagRDD
Abnormal Sales Percentage	1.000						
Lag MtoB	0.112	1.000					
Lag EBITD	0.061	0.215	1.000				
Lag Size	0.076	-0.238	0.300	1.000			
Lag PPE	-0.096	-0.240	0.243	0.232	1.000		
Lag RandD	0.141	0.269	-0.270	-0.318	-0.359	1.000	
Lag RDD	-0.114	-0.163	0.097	0.108	0.235	-0.737	1.000

Table 3.3:   Financing and Real Activities in the Year of the SEO

This table reports the coefficients and t-statistics of the coefficients from the regressions of net equity issues, net debt issues, change in dividends (multiplied by 100), change in cash balance, and level of investments in the year of the SEO on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO), lagged market-to-book, lagged EBITD, lagged Size, lagged PPE, lagged R&D, lagged RDD dummy (which equals 1 if lagged R&D value is missing), lagged High Leverage Dummy (which equals 1 if lagged book leverage is above 0.8), lagged Low Leverage Dummy (which equals 1 if lagged book leverage is below 0.1), Prior Stock Return, Days Since IPO, Primary Shares Percentage, Book Leverage prior to SEO, year dummies, and industry dummies based on the forty-eight industries categorization in Fama and French (1997). Coefficients of the year dummies and industry dummies are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	Lag MtoB	Lag EBITD	Lag Size	Lag PPE	Lag R&D	Lag RDD	Lag High Leverage Dummy	Lag Low Leverage Dummy	Prior Stock Return	Days Since IPO	Primary Shares %	BL prior to SEO	# Obs	R Square
Net Equity Issues (T=0)	0.016	0.029	-0.194	-0.049	-0.025	-0.001	0.000	-0.015	-0.032	0.023	0.000	0.176	0.010	1966	0.672
	2.060	*14.044*	*-9.399*	*-17.709*	*-1.425*	*-4.771*	*-0.023*	*-1.062*	*-2.110*	*10.363*	*-1.047*	*19.440*	*0.471*		
Net Debt Issues (T=0)	-0.025	0.004	-0.095	0.015	-0.049	0.000	0.013	0.026	-0.009	0.001	0.000	0.016	-0.159	2006	0.126
	-2.790	*1.877*	*-4.294*	*5.245*	*-2.558*	*1.001*	*1.510*	*1.601*	*-0.543*	*0.262*	*-2.788*	*1.613*	*-7.329*		
Change in Cash Balance (T=0)	0.027	0.022	-0.033	-0.026	-0.011	-0.001	-0.021			0.032	0.000	0.077	-0.040	2040	0.400
	2.968	*9.447*	*-1.432*	*-8.354*	*-0.566*	*-3.647*	*-2.321*			*13.134*	*0.741*	*7.564*	*-2.111*		
Change in Dividends (T=0)	0.023	-0.009	-0.070	0.006	0.076	0.000	0.008			0.006	0.000	-0.022	-0.060	2029	0.912
	1.751	*-2.651*	*-2.102*	*1.394*	*2.648*	*0.316*	*0.643*			*1.642*	*1.500*	*-1.480*	*-2.228*		
Investments (T=0)	0.006	0.005	0.064	-0.007	0.274	0.000	-0.006			-0.001	0.000	0.005	0.002	2017	0.499
	1.252	*4.031*	*5.402*	*-4.582*	*26.819*	*-1.485*	*-1.281*			*-0.614*	*-3.986*	*0.958*	*0.226*		

Table 3.4:   Investment and Changes in Cash Balance of the SEO Firms

This table reports the coefficients and t-statistics of the coefficients from the regressions of changes in cash balance and level of investments on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO), lagged EBITD, lagged Size, lagged PPE, lagged R&D, lagged RDD dummy (which equals 1 if lagged R&D value is missing), Market-to-book prior to the SEO, Prior Stock Return, Days Since IPO, Primary Shares Percentage, Book Leverage prior to SEO, year dummies, and industry dummies based on the forty-eight industries categorization in Fama and French (1997). Coefficients of the year dummies and industry dummies are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	Lag EBITD	Lag Size	Lag PPE	Lag R&D	Lag RDD	MtoB prior to SEO	Prior Stock Return	Days Since IPO	Primary Shares %	BL prior to SEO	# Obs	R Square
Change in Cash Balance (T=0)	0.027	-0.033	-0.026	-0.011	-0.001	-0.021	0.022	0.032	0.000	0.077	-0.040	2040	0.400
	2.968	*-1.432*	*-8.354*	*-0.566*	*-3.647*	*-2.321*	*9.447*	*13.134*	*0.741*	*7.564*	*-2.111*		
Change in Cash Balance (T=1)	0.008	0.275	0.005	-0.017	-0.001	-0.001	-0.004	-0.002	0.000	-0.006	0.028	1919	0.131
	0.847	*8.027*	*1.619*	*-0.775*	*-3.290*	*-0.128*	*-1.422*	*-0.720*	*0.508*	*-0.510*	*1.396*		
Change in Cash Balance (T=2)	0.009	0.091	0.005	0.026	0.000	0.004	-0.004	0.001	0.000	-0.011	-0.018	1740	0.069
	1.001	*3.239*	*1.504*	*1.284*	*-2.193*	*0.392*	*-1.876*	*0.347*	*-0.456*	*-1.048*	*-0.959*		
Change in Cash Balance (T=3)	0.006	0.105	0.004	-0.010	0.000	-0.002	-0.001	-0.007	0.000	0.009	0.036	1516	0.065
	0.642	*3.389*	*1.188*	*-0.436*	*0.456*	*-0.160*	*-0.511*	*-2.443*	*-0.348*	*0.796*	*1.701*		
Investments (T=0)	0.006	0.064	-0.007	0.274	0.000	-0.006	0.005	-0.001	0.000	0.005	0.002	2017	0.499
	1.252	*5.402*	*-4.582*	*26.819*	*-1.485*	*-1.281*	*4.031*	*-0.614*	*-3.986*	*0.958*	*0.226*		
Investments (T=1)	0.006	0.108	-0.009	0.254	0.000	-0.005	0.005	0.004	0.000	0.022	-0.005	1897	0.507
	1.299	*6.646*	*-5.376*	*24.074*	*-1.569*	*-1.010*	*4.212*	*2.783*	*-2.477*	*4.302*	*-0.580*		
Investments (T=2)	-0.001	0.102	-0.006	0.212	0.000	-0.010	0.001	0.002	0.000	0.015	-0.007	1718	0.471
	-0.308	*7.642*	*-3.843*	*21.798*	*-0.941*	*-2.183*	*0.760*	*1.682*	*-1.839*	*3.138*	*-0.769*		
Investments (T=3)	0.002	0.115	-0.005	0.176	0.000	-0.003	0.002	0.001	0.000	0.008	-0.001	1500	0.456
	0.413	*9.066*	*-3.525*	*18.615*	*-1.725*	*-0.724*	*2.270*	*0.632*	*-0.452*	*1.666*	*-0.104*		

Table 3.5:   Operating Performance of the SEO Firms

This table reports the coefficients and t-statistics of the coefficients from the regressions of EBITD on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO), lagged Size, lagged PPE, lagged R&D, lagged RDD dummy (which equals 1 if lagged R&D value is missing), Market-to-book prior to the SEO, Prior Stock Return, Days Since IPO, Primary Shares Percentage, Book Leverage prior to SEO, year dummies, and industry dummies based on the forty-eight industries categorization in Fama and French (1997). Coefficients of the year dummies and industry dummies are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	Lag Size	Lag PPE	Lag R&D	Lag RDD	MtoB prior to SEO	Prior Stock Return	Days Since IPO	Primary Shares %	BL prior to SEO	# Obs	R Square
EBITD (T=0)	-0.011	0.032	0.078	0.000	0.010	0.004	0.012	0.000	-0.081	-0.014	2044	0.497
	-1.524	*14.370*	*5.057*	*-0.585*	*1.424*	*2.047*	*6.116*	*0.506*	*-10.445*	*-0.941*		
EBITD (T=1)	0.007	0.041	0.095	-0.001	0.033	0.007	0.010	0.000	-0.080	-0.035	1909	0.473
	0.815	*14.190*	*4.773*	*-3.227*	*3.665*	*2.939*	*3.960*	*2.667*	*-8.335*	*-1.930*		
EBITD (T=2)	0.005	0.039	0.095	0.000	0.021	0.001	0.001	0.000	-0.072	-0.015	1734	0.454
	0.526	*14.009*	*4.790*	*0.262*	*2.301*	*0.637*	*0.312*	*1.584*	*-7.454*	*-0.814*		
EBITD (T=3)	-0.021	0.040	0.117	0.000	0.030	0.002	0.000	0.000	-0.062	0.003	1518	0.471
	-2.275	*13.925*	*5.646*	*0.532*	*3.201*	*0.990*	*-0.186*	*1.829*	*-6.209*	*0.151*		
EBITD (T=4)	-0.015	0.038	0.084	-0.002	0.031	0.003	0.002	0.000	-0.048	0.017	1317	0.469
	-1.578	*12.457*	*3.909*	*-5.679*	*3.034*	*1.346*	*0.782*	*1.946*	*-4.429*	*0.847*		
EBITD (T=5)	-0.013	0.037	0.107	0.000	0.018	0.007	-0.005	0.000	-0.041	-0.016	1150	0.428
	-1.318	*12.056*	*4.678*	*-0.210*	*1.689*	*2.930*	*-1.888*	*0.828*	*-3.646*	*-0.758*		

Table 3.6:   Capital Structure of the SEO Firms

This table reports the coefficients and t-statistics of the coefficients from the regressions of book leverage on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO), lagged market-to-book, lagged EBITD, lagged Size, lagged PPE, lagged R&D, lagged RDD dummy (which equals 1 if lagged R&D value is missing), Market-to-book prior to the SEO, Prior Stock Return, Days Since IPO, Primary Shares Percentage, Book Leverage prior to SEO, year dummies, and industry dummies based on the forty-eight industries categorization in Fama and French (1997). Coefficients of the year dummies and industry dummies are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	Lag MtoB	Lag EBITD	Lag Size	Lag PPE	Lag R&D	Lag RDD	MtoB prior to SEO	Prior Stock Return	Days Since IPO	Primary Shares %	BL prior to SEO	# Obs	R Square
BL (T=-1)	-0.089	-0.019	-0.156	0.047	0.119	0.000	0.010		0.004	0.000	0.048		1496	0.372
	-7.321	*-5.208*	*-4.730*	*11.951*	*4.159*	*1.355*	*0.730*		*1.740*	*-0.172*	*3.183*			
BL (T=0)	-0.026	-0.008	-0.118	0.029	-0.019	0.001	0.003		-0.016	0.000	-0.051	0.595	2027	0.739
	-3.950	*-4.316*	*-6.851*	*12.492*	*-1.255*	*4.084*	*0.465*		*-8.647*	*-1.716*	*-6.777*	*42.384*		
BL (T=1)	-0.016	-0.013	-0.416	0.035	0.094	0.001	0.008	-0.005	-0.010	0.000	-0.058	0.507	1872	0.640
	-1.893	*-4.475*	*-13.409*	*11.854*	*4.724*	*3.581*	*0.908*	*-2.081*	*-4.171*	*-2.244*	*-5.942*	*28.655*		
BL (T=2)	-0.026	-0.016	-0.336	0.037	0.108	0.000	0.004	-0.005	-0.009	0.000	-0.018	0.437	1702	0.559
	-2.652	*-5.262*	*-10.939*	*11.019*	*4.905*	*1.983*	*0.351*	*-1.930*	*-3.308*	*-2.314*	*-1.617*	*21.620*		
BL (T=3)	-0.017	-0.016	-0.404	0.040	0.095	0.001	0.009	-0.004	-0.013	0.000	-0.007	0.386	1480	0.492
	-1.533	*-4.356*	*-11.417*	*10.016*	*3.668*	*2.259*	*0.727*	*-1.462*	*-4.050*	*-1.984*	*-0.539*	*16.113*		
BL (T=4)	-0.020	-0.017	-0.407	0.039	0.103	0.001	0.000	-0.003	-0.010	0.000	0.002	0.328	1291	0.462
	-1.635	*-4.387*	*-10.095*	*9.167*	*3.622*	*2.391*	*-0.028*	*-0.923*	*-2.857*	*-1.134*	*0.151*	*12.256*		
BL (T=5)	-0.006	-0.018	-0.410	0.040	0.103	0.000	0.027	-0.004	-0.010	0.000	-0.012	0.355	1115	0.470
	-0.434	*-4.332*	*-9.131*	*8.772*	*3.265*	*-0.206*	*1.794*	*-0.994*	*-2.488*	*-1.466*	*-0.793*	*12.324*		

Table 3.7:   Cumulative Changes in Capital Structure of the SEO Firms

This table reports the coefficients and t-statistics of the coefficients from the regressions of cumulative changes in book leverage on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO), lagged market-to-book, lagged EBITD, lagged Size, lagged PPE, lagged R&D, lagged RDD dummy (which equals 1 if lagged R&D value is missing), lagged Investment, Market-to-book prior to the SEO, Prior Stock Return, Days Since IPO, Primary Shares Percentage, Book Leverage prior to SEO, year dummies, and industry dummies based on the forty-eight industries categorization in Fama and French (1997). Coefficients of the year dummies and industry dummies are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	Lag MtoB	Lag EBITD	Lag Size	Lag PPE	Lag R&D	Lag RDD	Lag INV	MtoB prior to SEO	Prior Stock Return	Days Since IPO	Primary Shares %	BL prior to SEO	# Obs	R Square
Cumulative Change in BL (T=1)	-0.017	-0.013	-0.426	0.036	0.030	0.001	0.009	0.182	-0.006	-0.010	0.000	-0.061	-0.489	1851	0.419
	-1.968	*-4.519*	*-13.738*	*12.153*	*1.148*	*3.563*	*1.041*	*3.777*	*-2.560*	*-4.336*	*-1.879*	*-6.233*	*-27.695*		
Cumulative Change in BL (T=2)	-0.026	-0.016	-0.339	0.037	0.098	0.000	0.004	0.033	-0.005	-0.009	0.000	-0.018	-0.563	1682	0.424
	-2.665	*-5.287*	*-10.897*	*11.015*	*3.391*	*1.978*	*0.354*	*0.560*	*-1.969*	*-3.351*	*-2.270*	*-1.669*	*-27.849*		
Cumulative Change in BL (T=3)	-0.018	-0.016	-0.399	0.040	0.116	0.000	0.008	-0.081	-0.004	-0.013	0.000	-0.006	-0.615	1466	0.424
	-1.551	*-4.279*	*-11.212*	*9.953*	*3.620*	*2.207*	*0.687*	*-1.110*	*-1.406*	*-4.012*	*-2.018*	*-0.463*	*-25.657*		
Cumulative Change in BL (T=4)	-0.020	-0.017	-0.401	0.039	0.123	0.001	-0.001	-0.090	-0.003	-0.010	0.000	0.003	-0.673	1280	0.452
	-1.631	*-4.229*	*-9.816*	*9.113*	*3.592*	*2.417*	*-0.058*	*-1.051*	*-0.888*	*-2.842*	*-1.147*	*0.199*	*-25.104*		
Cumulative Change in BL (T=5)	-0.006	-0.017	-0.404	0.040	0.116	0.000	0.027	-0.064	-0.003	-0.009	0.000	-0.011	-0.644	1108	0.445
	-0.446	*-4.202*	*-8.798*	*8.721*	*3.109*	*-0.196*	*1.806*	*-0.666*	*-0.963*	*-2.474*	*-1.474*	*-0.738*	*-22.330*		

Table 3.8:   Changes in Capital Structure of the SEO Firms

This table reports the coefficients and t-statistics of the coefficients from the regressions of annual changes in book leverage on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO), lagged market-to-book, lagged EBITD, lagged Size, lagged PPE, lagged R&D, lagged RDD dummy (which equals 1 if lagged R&D value is missing), lagged Investment, lagged High Leverage Dummy (which equals 1 if lagged book leverage is above 0.8), lagged Low Leverage Dummy (which equals 1 if lagged book leverage is below 0.1), Market-to-book prior to the SEO, Prior Stock Return, Days Since IPO, Primary Shares Percentage, Book Leverage prior to SEO, year dummies, and industry dummies based on the forty-eight industries categorization in Fama and French (1997). Coefficients of the year dummies and industry dummies are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	Lag MtoB	Lag EBITD	Lag Size	Lag PPE	Lag R&D	Lag RDD	Lag INV	Lag High Leverage Dummy	Lag Low Leverage Dummy	MtoB prior to SEO	Prior Stock Return	Days Since IPO	Primary Shares %	BL prior to SEO	# Obs	R Square
Change in BL (T=0)	-0.026	-0.008	-0.118	0.029	-0.019	0.001	0.003	0.047	0.058	0.022		-0.016	0.000	-0.051	-0.405	2006	0.368
	-3.950	*-4.316*	*-6.851*	*12.492*	*-1.255*	*4.084*	*0.465*	*1.393*	*4.625*	*1.763*		*-8.647*	*-1.716*	*-6.777*	*-28.851*		
Change in BL (T=1)	0.006	-0.005	-0.141	-0.003	-0.004	0.000	0.005	0.134	-0.067	0.008	-0.002	-0.001	0.000	0.003	-0.049	1870	0.138
	0.824	*-2.284*	*-5.624*	*-1.310*	*-0.211*	*-0.376*	*0.640*	*3.447*	*-3.720*	*0.867*	*-0.856*	*-0.467*	*-1.337*	*0.400*	*-3.246*		
Change in BL (T=2)	-0.006	-0.008	-0.012	-0.002	-0.017	0.000	-0.002	0.065	-0.061	0.012	0.002	0.002	0.000	0.031	-0.040	1714	0.100
	-0.849	*-3.701*	*-0.531*	*-0.762*	*-0.816*	*-0.892*	*-0.259*	*1.541*	*-3.362*	*1.123*	*1.319*	*0.817*	*-1.613*	*3.977*	*-2.655*		
Change in BL (T=3)	0.006	-0.006	-0.025	0.000	-0.016	0.000	-0.003	0.039	-0.120	0.019	0.002	0.000	0.000	0.008	-0.023	1495	0.105
	0.825	*-2.552*	*-1.029*	*-0.163*	*-0.742*	*-1.026*	*-0.376*	*0.796*	*-6.914*	*1.571*	*1.104*	*0.124*	*-1.477*	*0.983*	*-1.416*		
Change in BL (T=4)	0.001	-0.008	-0.050	0.001	-0.002	0.001	-0.006	0.029	-0.107	0.029	0.001	-0.001	0.000	0.002	-0.029	1309	0.105
	0.092	*-3.153*	*-1.996*	*0.384*	*-0.109*	*1.975*	*-0.761*	*0.550*	*-6.168*	*2.317*	*0.587*	*-0.654*	*0.232*	*0.172*	*-1.755*		
Change in BL (T=5)	0.018	-0.008	-0.103	0.003	-0.015	0.000	0.008	0.093	-0.133	0.032	0.001	-0.004	0.000	-0.009	0.018	1140	0.123
	2.047	*-3.144*	*-3.470*	*0.988*	*-0.637*	*0.265*	*0.795*	*1.517*	*-6.122*	*2.332*	*0.457*	*-1.693*	*-1.791*	*-0.929*	*0.944*		

Table 3.9:   Net Debt Issues of the SEO Firms

This table reports the coefficients and t-statistics of the coefficients from the regressions of net debt issues on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO), lagged market-to-book, lagged EBITD, lagged Size, lagged PPE, lagged R&D, lagged RDD dummy (which equals 1 if lagged R&D value is missing), lagged Investment, lagged High Leverage Dummy (which equals 1 if lagged book leverage is above 0.8), lagged Low Leverage Dummy (which equals 1 if lagged book leverage is below 0.1), Market-to-book prior to the SEO, Prior Stock Return, Days Since IPO, Primary Shares Percentage, Book Leverage prior to SEO, year dummies, and industry dummies based on the forty-eight industries categorization in Fama and French (1997). Coefficients of the year dummies and industry dummies are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	Lag MtoB	Lag EBITD	Lag Size	Lag PPE	Lag R&D	Lag RDD	Lag INV	Lag High Leverage Dummy	Lag Low Leverage Dummy	MtoB prior to SEO	Prior Stock Return	Days Since IPO	Primary Shares %	BL prior to SEO	# Obs	R Square
Net Debt Issues (T=0)	-0.025	0.004	-0.095	0.015	-0.049	0.000	0.013	0.187	0.026	-0.009		0.001	0.000	0.016	-0.159	2006	0.126
	-2.790	*1.877*	*-4.294*	*5.245*	*-2.558*	*1.001*	*1.510*	*4.291*	*1.601*	*-0.543*		*0.262*	*-2.788*	*1.613*	*-7.329*		
Net Debt Issues (T=1)	-0.001	0.004	-0.044	0.003	-0.043	0.000	0.009	0.246	-0.071	0.007	-0.007	0.000	0.000	0.010	0.026	1869	0.134
	-0.100	*1.401*	*-1.372*	*0.867*	*-1.596*	*-1.382*	*0.980*	*4.972*	*-3.092*	*0.603*	*-2.554*	*-0.193*	*-2.423*	*1.049*	*1.370*		
Net Debt Issues (T=2)	-0.002	0.004	0.078	0.000	-0.007	0.000	-0.002	0.055	-0.091	0.013	-0.001	0.001	0.000	0.034	0.016	1709	0.113
	-0.227	*1.563*	*2.876*	*-0.084*	*-0.287*	*-0.742*	*-0.279*	*1.073*	*-4.100*	*1.030*	*-0.312*	*0.437*	*-1.651*	*3.518*	*0.845*		
Net Debt Issues (T=3)	0.007	0.011	0.030	0.005	-0.044	0.000	-0.012	0.147	-0.107	0.022	-0.001	-0.001	0.000	0.015	-0.002	1491	0.124
	0.772	*3.414*	*0.992*	*1.527*	*-1.604*	*0.312*	*-1.244*	*2.371*	*-4.802*	*1.469*	*-0.584*	*-0.249*	*-0.819*	*1.396*	*-0.093*		
Net Debt Issues (T=4)	0.003	0.008	-0.007	0.006	0.013	0.000	-0.017	0.125	-0.132	0.026	-0.001	0.002	0.000	-0.002	0.015	1305	0.138
	0.312	*2.531*	*-0.214*	*1.722*	*0.491*	*-0.717*	*-1.659*	*1.931*	*-6.177*	*1.665*	*-0.311*	*0.811*	*1.045*	*-0.212*	*0.746*		
Net Debt Issues (T=5)	0.005	0.012	-0.037	0.001	0.015	0.000	0.008	0.149	-0.135	0.027	0.003	-0.006	0.000	-0.022	0.050	1135	0.125
	0.449	*3.652*	*-0.992*	*0.155*	*0.479*	*-0.022*	*0.682*	*1.928*	*-4.956*	*1.547*	*0.924*	*-1.893*	*-1.185*	*-1.772*	*2.072*		

Table 3.10: Net Equity Issues of the SEO Firms

This table reports the coefficients and t-statistics of the coefficients from the regressions of net equity issues on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO), lagged market-to-book, lagged EBITD, lagged Size, lagged PPE, lagged R&D, lagged RDD dummy (which equals 1 if lagged R&D value is missing), lagged Investment, lagged High Leverage Dummy (which equals 1 if lagged book leverage is above 0.8), lagged Low Leverage Dummy (which equals 1 if lagged book leverage is below 0.1), Market-to-book prior to the SEO, Prior Stock Return, Days Since IPO, Primary Shares Percentage, Book Leverage prior to SEO, year dummies, and industry dummies based on the forty-eight industries categorization in Fama and French (1997). Coefficients of the year dummies and industry dummies are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	Lag MtoB	Lag EBITD	Lag Size	Lag PPE	Lag R&D	Lag RDD	Lag INV	Lag High Leverage Dummy	Lag Low Leverage Dummy	MtoB prior to SEO	Prior Stock Return	Days Since IPO	Primary Shares %	BL prior to SEO	# Obs	R Square
Net Equity Issues (T=0)	0.016	0.029	-0.194	-0.049	-0.025	-0.001	0.000	0.076	-0.015	-0.032		0.023	0.000	0.176	0.010	1966	0.672
	2.060	*14.044*	*-9.399*	*-17.709*	*-1.425*	*-4.771*	*-0.023*	*1.862*	*-1.062*	*-2.110*		*10.363*	*-1.047*	*19.440*	*0.471*		
Net Equity Issues (T=1)	-0.004	0.029	-0.239	-0.007	-0.022	-0.001	0.000	0.059	0.026	-0.042	-0.004	-0.002	0.000	0.028	-0.004	1847	0.201
	-0.422	*9.246*	*-6.900*	*-2.042*	*-0.770*	*-1.914*	*-0.050*	*1.096*	*1.037*	*-3.131*	*-1.519*	*-0.673*	*-1.349*	*2.578*	*-0.214*		
Net Equity Issues (T=2)	0.008	0.031	-0.288	-0.005	-0.011	0.000	0.015	0.120	-0.009	-0.045	-0.009	0.000	0.000	0.013	-0.013	1688	0.237
	0.857	*11.072*	*-9.919*	*-1.609*	*-0.421*	*-0.543*	*1.560*	*2.189*	*-0.369*	*-3.346*	*-3.622*	*0.092*	*0.558*	*1.231*	*-0.681*		
Net Equity Issues (T=3)	-0.008	0.034	-0.329	0.001	0.018	0.000	0.000	0.076	0.059	-0.035	-0.004	-0.002	0.000	0.028	-0.015	1476	0.295
	-0.850	*11.546*	*-11.306*	*0.376*	*0.684*	*1.624*	*0.040*	*1.288*	*2.792*	*-2.409*	*-1.767*	*-0.923*	*-0.519*	*2.671*	*-0.735*		
Net Equity Issues (T=4)	-0.002	0.036	-0.384	-0.002	0.024	-0.001	0.006	0.126	0.037	-0.070	-0.007	0.003	0.000	0.018	-0.049	1289	0.363
	-0.240	*11.600*	*-11.976*	*-0.478*	*0.892*	*-2.631*	*0.616*	*1.879*	*1.666*	*-4.333*	*-2.669*	*1.197*	*0.362*	*1.600*	*-2.311*		
Net Equity Issues (T=5)	-0.024	0.037	-0.326	-0.004	0.018	0.000	0.002	0.084	0.059	-0.032	-0.002	0.004	0.000	0.014	-0.024	1126	0.348
	-2.338	*11.598*	*-9.155*	*-1.175*	*0.626*	*-0.053*	*0.137*	*1.141*	*2.252*	*-1.946*	*-0.658*	*1.449*	*0.277*	*1.152*	*-1.049*		

Table 3.11: Robustness Test: Regression Controlling for Hot Market Effects

This table reports the coefficients and t-statistics of the coefficients from the regressions on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO), Hot Equity Market Dummy (which equals 1 if an SEO is completed in a hot equity market), and other control variables. The specification of the models is the same as in Table 3.3 to Table 3.10, except for the inclusion of the Hot Equity Market. Coefficients of the control variables are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	Hot Equity Market	R Square
Net Equity Issues (T=0)	0.014	0.014	0.675
	1.690	*1.706*	
Net Debt Issues (T=0)	-0.022	0.008	0.136
	-2.561	*0.935*	
Change in Dividends (T=0)	0.023	0.000	0.912
	1.756	*0.227*	
Change in Cash Balance (T=0)	0.027	0.007	0.400
	2.992	*0.774*	
Change in Cash Balance (T=1)	0.007	-0.019	0.133
	0.782	*-1.848*	
Change in Cash Balance (T=2)	0.009	-0.004	0.070
	0.990	*-0.431*	
Change in Cash Balance (T=3)	0.006	-0.030	0.070
	0.563	*-2.837*	
Investment (T=0)	-0.002	0.000	0.510
	-0.463	*-0.084*	
Investment (T=1)	0.006	0.003	0.507
	1.320	*0.609*	
Investment (T=2)	-0.001	-0.004	0.471
	-0.329	*-0.841*	
Investment (T=3)	0.002	0.004	0.457
	0.441	*0.969*	

Table 3.11: Robustness Test: Regression Controlling for Hot Market Effects (Continued)

Dependent Variable	Abnormal Sales Percentage	Hot Equity Market	R Square
EBITD (T=0)	-0.010	-0.005	0.497
	-1.477	*-0.730*	
EBITD (T=1)	0.007	-0.013	0.473
	0.764	*-1.410*	
EBITD (T=2)	0.004	-0.014	0.454
	0.489	*-1.492*	
EBITD (T=3)	-0.018	0.000	0.473
	-1.897	*-0.032*	
BL (T=-1)	-0.089	0.006	0.372
	-7.299	*0.406*	
BL (T=0)	-0.026	-0.001	0.738
	-3.920	*-0.173*	
BL (T=1)	-0.016	-0.005	0.640
	-1.909	*-0.515*	
BL (T=2)	-0.026	-0.007	0.559
	-2.667	*-0.678*	
BL (T=3)	-0.017	-0.003	0.492
	-1.539	*-0.271*	
BL (T=4)	-0.021	-0.005	0.463
	-1.644	*-0.356*	
BL (T=5)	-0.006	-0.008	0.470
	-0.455	*-0.575*	
Cumulative Change in BL (T=1)	-0.017	-0.004	0.419
	-1.983	*-0.475*	
Cumulative Change in BL (T=2)	-0.026	-0.007	0.425
	-2.679	*-0.668*	
Cumulative Change in BL (T=3)	-0.018	-0.003	0.424
	-1.558	*-0.284*	
Cumulative Change in BL (T=4)	-0.020	-0.004	0.452
	-1.639	*-0.331*	
Cumulative Change in BL (T=5)	-0.006	-0.008	0.445
	-0.467	*-0.570*	

Table 3.11: Robustness Test: Regression Controlling for Hot Market Effects (Continued)

Dependent Variable	Abnormal Sales Percentage	Hot Equity Market	R Square
Change in BL (T=0)	-0.026	-0.002	0.378
	-3.832	*-0.224*	
Change in BL (T=1)	0.006	0.000	0.138
	0.824	*0.016*	
Change in BL (T=2)	-0.006	0.003	0.100
	-0.839	*0.361*	
Change in BL (T=3)	0.006	0.007	0.106
	0.849	*0.837*	
Change in BL (T=4)	0.000	-0.008	0.106
	0.065	*-1.049*	
Change in BL (T=5)	0.017	-0.009	0.124
	2.009	*-0.979*	
Net Debt Issues (T=1)	-0.001	-0.011	0.135
	-0.140	*-1.183*	
Net Debt Issues (T=2)	-0.002	-0.010	0.114
	-0.254	*-1.062*	
Net Debt Issues (T=3)	0.008	0.003	0.124
	0.781	*0.293*	
Net Debt Issues (T=4)	0.003	0.001	0.138
	0.315	*0.152*	
Net Debt Issues (T=5)	0.004	-0.032	0.132
	0.341	*-2.938*	
Net Equity Issues (T=1)	-0.005	-0.025	0.204
	-0.507	*-2.517*	
Net Equity Issues (T=2)	0.007	-0.010	0.238
	0.832	*-0.990*	
Net Equity Issues (T=3)	-0.009	-0.029	0.300
	-0.943	*-3.018*	
Net Equity Issues (T=4)	-0.002	0.016	0.364
	-0.200	*1.553*	
Net Equity Issues (T=5)	-0.025	-0.006	0.348
	-2.357	*-0.562*	

Table 3.12:   Robustness Test: Regressions with Abnormal Sales Percentage by SEC
            Receipt Date

This table reports the coefficients and t-statistics of the coefficients from the regressions on Abnormal Sales Percentage (percentage of insider sales in the six months prior to the SEO, minus the average percentage of insider sales in the year starting at two years prior to the SEO) and control variables. Time of the insider trades is measured by the SEC Receipt Date. The specification of the models is the same as in Table 3.3 to Table 3.10, except for the measure of insider trading activities prior to the SEO. Coefficients of the control variables are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage	R Square
Net Equity Issues (T=0)	0.014	0.674
	1.794	
Net Debt Issues (T=0)	-0.026	0.136
	-2.923	
Change in Dividends (T=0)	0.000	0.912
	1.910	
Change in Cash Balance (T=0)	0.027	0.400
	3.075	
Change in Cash Balance (T=1)	0.007	0.131
	0.709	
Change in Cash Balance (T=2)	0.004	0.069
	0.486	
Change in Cash Balance (T=3)	0.009	0.065
	0.923	
Investment (T=0)	0.004	0.510
	0.897	
Investment (T=1)	0.006	0.507
	1.288	
Investment (T=2)	0.000	0.471
	-0.054	
Investment (T=3)	0.002	0.456
	0.481	

Table 3.12: Robustness Test: Regressions with Abnormal Sales Percentage by SEC Receipt Date (Continued)

Dependent Variable	Abnormal Sales Percentage	R Square
EBITD (T=0)	-0.012	0.497
	-1.750	
EBITD (T=1)	-0.010	0.473
	-1.224	
EBITD (T=2)	0.006	0.454
	0.725	
EBITD (T=3)	-0.001	0.471
	-0.126	
BL (T=-1)	-0.081	0.368
	-6.706	
BL (T=0)	-0.025	0.738
	-3.824	
BL (T=1)	-0.019	0.640
	-2.221	
BL (T=2)	-0.025	0.559
	-2.648	
BL (T=3)	-0.018	0.492
	-1.607	
BL (T=4)	-0.016	0.463
	-1.322	
BL (T=5)	-0.004	0.470
	-0.295	
Cumulative Change in BL (T=1)	-0.019	0.419
	-2.325	
Cumulative Change in BL (T=2)	-0.026	0.424
	-2.664	
Cumulative Change in BL (T=3)	-0.018	0.424
	-1.615	
Cumulative Change in BL (T=4)	-0.019	0.452
	-1.502	
Cumulative Change in BL (T=5)	-0.004	0.445
	-0.302	

Table 3.12: Robustness Test: Regressions with Abnormal Sales Percentage by SEC Receipt Date (Continued)

Dependent Variable	Abnormal Sales Percentage	R Square
Change in BL (T=0)	-0.025	0.378
	-3.779	
Change in BL (T=1)	0.003	0.138
	0.410	
Change in BL (T=2)	-0.003	0.100
	-0.495	
Change in BL (T=3)	0.006	0.105
	0.745	
Change in BL (T=4)	-0.004	0.105
	-0.541	
Change in BL (T=5)	0.014	0.121
	1.647	
Net Debt Issues (T=1)	-0.006	0.135
	-0.720	
Net Debt Issues (T=2)	0.001	0.113
	0.090	
Net Debt Issues (T=3)	0.007	0.124
	0.758	
Net Debt Issues (T=4)	0.002	0.138
	0.260	
Net Debt Issues (T=5)	0.007	0.125
	0.651	
Net Equity Issues (T=1)	-0.003	0.201
	-0.335	
Net Equity Issues (T=2)	0.009	0.238
	0.963	
Net Equity Issues (T=3)	-0.007	0.295
	-0.765	
Net Equity Issues (T=4)	-0.004	0.363
	-0.451	
Net Equity Issues (T=5)	-0.018	0.347
	-1.728	

Table 3.13: Robustness Test: Regressions with Abnormal Sales Percentage Adjusted for Firm Characteristics and Firm Fixed Effects

This table reports the coefficients and t-statistics of the coefficients from the regression of insider sales percentage on firm characteristics such as pre-issue stock run-up, the market-to-book ratio, and firm size, as well as firm fixed effects. The specification of the models is the same as in Table 3.3 to Table 3.10, except for the measure of insider trading activities prior to the SEO. Coefficients of the control variables are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Abnormal Sales Percentage Adjusted for Firm Characteristics and Firm Fixed Effects	R Square
Net Equity Issues (T=0)	0.027	0.610
	1.536	
Net Debt Issues (T=0)	-0.004	0.124
	-0.247	
Change in Dividends (T=0)	0.031	0.898
	1.121	
Change in Cash Balance (T=0)	0.050	0.389
	2.810	
Change in Cash Balance (T=1)	-0.030	0.162
	-1.448	
Change in Cash Balance (T=2)	-0.010	0.127
	-0.457	
Change in Cash Balance (T=3)	-0.001	0.093
	-0.023	
Investment (T=0)	0.003	0.491
	0.369	
Investment (T=1)	0.003	0.491
	0.287	
Investment (T=2)	-0.009	0.465
	-1.108	
Investment (T=3)	-0.005	0.447
	-0.582	
EBITD (T=0)	0.006	0.493
	0.454	
EBITD (T=1)	-0.018	0.442
	-1.016	
EBITD (T=2)	-0.034	0.461
	-1.859	
EBITD (T=3)	-0.033	0.484
	-1.765	

Table 3.13: Robustness Test: Regressions with Abnormal Sales Percentage Adjusted for Firm Characteristics and Firm Fixed Effects (Continued)

Dependent Variable	Abnormal Sales Percentage Adjusted for Firm Characteristics and Firm Fixed Effects	R Square
BL (T=-1)	-0.009	0.344
	-0.342	
BL (T=0)	-0.018	0.739
	-1.347	
BL (T=1)	0.007	0.626
	0.380	
BL (T=2)	-0.009	0.547
	-0.449	
BL (T=3)	-0.018	0.487
	-0.767	
Change in BL (T=0)	-0.018	0.333
	-1.300	
Cumulative Change in BL (T=1)	0.004	0.393
	0.254	
Cumulative Change in BL (T=2)	-0.010	0.411
	-0.528	
Cumulative Change in BL (T=3)	-0.019	0.413
	-0.821	
Net Debt Issues (T=1)	-0.004	0.130
	-0.246	
Net Debt Issues (T=2)	-0.008	0.099
	-0.434	
Net Debt Issues (T=3)	-0.012	0.115
	-0.587	
Net Equity Issues (T=1)	-0.032	0.208
	-1.649	
Net Equity Issues (T=2)	-0.021	0.230
	-1.148	
Net Equity Issues (T=3)	-0.015	0.298
	-0.773	

Table 3.14: Robustness Test: Regressions with Pure Insider Sales

This table reports the coefficients and t-statistics of the coefficients from the regressions on Pure Insider Sales (dummy which equals 1 for SEO firms with pure insider sales within the six month prior to the SEO) and control variables. The specification of the models is the same as in Table 3.3 to Table 3.10, except for the measure of insider trading activities prior to the SEO. Coefficients of the control variables are subsided from the tables. Robust T-statistics are reported in italics.

Dependent Variable	Pure Insider Sales	R Square
Net Equity Issues (T=0)	0.010	0.674
	1.626	
Net Debt Issues (T=0)	-0.017	0.136
	-2.628	
Change in Dividends (T=0)	0.011	0.912
	1.091	
Change in Cash Balance (T=0)	0.022	0.401
	3.217	
Change in Cash Balance (T=1)	0.009	0.131
	1.208	
Change in Cash Balance (T=2)	-0.005	0.069
	-0.667	
Change in Cash Balance (T=3)	0.009	0.066
	1.167	
Investment (T=0)	0.001	0.509
	0.321	
Investment (T=1)	0.004	0.507
	1.221	
Investment (T=2)	0.004	0.471
	1.312	
Investment (T=3)	0.002	0.457
	0.693	

Table 3.14:   Robustness Test: Regressions with Pure Insider Sales (Continued)

Dependent Variable	Pure Insider sales	R Square
EBITD (T=0)	0.001	0.498
	0.225	
EBITD (T=1)	0.001	0.474
	0.220	
EBITD (T=2)	0.002	0.453
	0.311	
EBITD (T=3)	-0.002	0.471
	-0.280	
BL (T=-1)	-0.038	0.355
	-3.837	
BL (T=0)	-0.019	0.738
	-3.611	
BL (T=1)	-0.011	0.640
	-1.749	
BL (T=2)	-0.014	0.558
	-1.835	
BL (T=3)	-0.018	0.493
	-2.048	
BL (T=4)	-0.016	0.462
	-1.611	
BL (T=5)	-0.008	0.470
	-0.770	
Cumulative Change in BL (T=1)	-0.012	0.419
	-1.785	
Cumulative Change in BL (T=2)	-0.014	0.423
	-1.847	
Cumulative Change in BL (T=3)	-0.018	0.425
	-2.015	
Cumulative Change in BL (T=4)	-0.015	0.452
	-1.596	
Cumulative Change in BL (T=5)	-0.008	0.445
	-0.752	

Table 3.14:   Robustness Test: Regressions with Pure Insider Sales (Continued)

Dependent Variable	Pure Insider Sales	R Square
Change in BL (T=0)	-0.017	0.377
	-3.393	
Change in BL (T=1)	0.001	0.138
	0.210	
Change in BL (T=2)	-0.002	0.100
	-0.441	
Change in BL (T=3)	0.000	0.105
	0.037	
Change in BL (T=4)	-0.003	0.105
	-0.515	
Change in BL (T=5)	0.007	0.120
	1.105	
Net Debt Issues (T=1)	0.002	0.134
	0.240	
Net Debt Issues (T=2)	-0.003	0.114
	-0.460	
Net Debt Issues (T=3)	0.002	0.124
	0.243	
Net Debt Issues (T=4)	0.002	0.138
	0.239	
Net Debt Issues (T=5)	-0.007	0.125
	-0.791	
Net Equity Issues (T=1)	-0.006	0.201
	-0.826	
Net Equity Issues (T=2)	-0.003	0.237
	-0.458	
Net Equity Issues (T=3)	-0.010	0.296
	-1.369	
Net Equity Issues (T=4)	0.011	0.364
	1.432	
Net Equity Issues (T=5)	-0.013	0.346
	-1.610	

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