Three Essays on Empirical Finance

by

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Abstract

This thesis presents three separate essays. We (1) study the headquarters relocation event and understand who benefits from the relocation decisions; (2) investigate the role of firm opacity in determining insider trading informativeness; and (3) document whether and when highly trained human capital help increase and sustain firm value.

In Chapter 2, we use a sample of headquarters relocations in the US and investigate the impact of relocations. We find limited evidence that relocation decisions correlate with increases in shareholder values. Exploring the impact for stakeholders shows no robust evidence on employees, creditors and communities' wealth changes. Instead, we find significantly lower individual top marginal income tax rates, top capital gains rates and average tax burdens in new headquarters locations compared to the old locations, which result in increased CEO wealth after relocations. We also show that personal tax rates are important considerations in headquarters location choices, and personal tax concerns are more important for CEOs with higher compensation and longer expectations to stay with the firm. Lastly, we provide some evidence that corporate governance helps: we document positive stock market reactions and no significant drop in personal tax rates for a subsample of firms that are well governed.

Chapter 3 examines the insider trading behaviours and documents positive association between firm opacity and insider trading informativeness. Specifically, insider purchases better predict future returns in firms with more earnings management and less firm-specific return variation. These associations are stronger for trades from key insiders like directors, and weaker for trades from beneficial owners, who are less involved in firm operations. Our findings suggest that insider trading is more informative when alternative information sources are of poorer quality.

In Chapter 4, we investigate whether and when highly trained human capital constitutes a rent-sustaining resource. Our study of 444 CEOs celebrated on the covers of major U.S. business magazines find an advantage accruing to graduates of selective universities. Such CEOs led firms with higher and more sustained market valuations. The advantage is strongest for undergraduate programs as these relate to the kinds of talent demanded of a CEO. The advantage also is greatest in smaller firms where CEO discretion might be highest and for younger CEOs who may benefit most from college and are less able to appropriate rents. Finally, the advantage accrues to graduates of more recent years, when selective schools have become less socially elitist and increasingly meritocratic, thus favoring human versus social capital.

Preface

Some of the researches conducted for this thesis are joint research collaborations. Chapter 3 is a joint work with Zhenyang Tang and Rengong Zhang, both from University of Alberta. As a team we work together on the research idea and research design; besides I was responsible for a significant portion of data analysis as well as the manuscript writings.

Chapter 4 of this thesis has been accepted for publication as Danny Miller, Xiaowei Xu, and Vikas Mehrotra, "When is human capital a valuable resource? The performance effects of Ivy league selection among celebrated CEOs", *Strategic Management Journal*, 2014. Dr. Danny Miller is from HEC Montreal and University of Alberta, and Dr. Vikas Mehrotra is from University of Alberta. In this Chapter, Dr. Danny Miller, Dr. Vikas Mehrotra and I co-developed the research concept throughout the procedure. And I was fully responsible for data collection and data analysis.

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Chapter 1 . Introduction

This thesis contains three separate essays on headquarters relocations, insider trading informativeness and CEO education. Among those seemingly unrelated topics, the common theme is the role of CEOs –the corporate decisions they make, the trading behaviours they have or the educations they obtain--in corporate valuations.

Chapter 2 examines a high profile corporate decision –headquarters relocations, and its implications on shareholders, employees, creditors, communities and managers. Similar to other corporate events such as mergers and acquisitions, managers sometimes give vague reasons about why they choose to relocate their headquarters; phrases such as "to better reflect corporate value" and "to facilitate corporate growth" are often used when relocation announcements are made. However, the real valuation consequences of relocations are rarely studied. At the same time, analyzing the event has interesting policy implications to local communities: politicians worry about losing corporate headquarters and welcome the addition of headquarters to their jurisdictions; media refers to this concern as the "hollowing out" effect, where losses of corporate headquarters are perceived to harm the local economy. Thus, it is important to investigate the event not only from the perspective of shareholders, but also from the perspectives of other stakeholders of the firm, whose interest may be influenced by relocation decisions. We first evaluate the market assessment of relocations by studying the stock market reactions to relocation announcement. For long-term relocation consequences, we then compare the three-year performance changes of relocating firms to their non-moving matching peers. Yet contradictory to common perceptions that relocations benefit firms or communities, we do not find evidence that relocations benefit shareholders, employees, creditors and communities on average. Finally, when we examine the personal benefit that top managers obtain after relocations, we find significantly lower personal tax rates in states that top managers move to

comparing to the states that they move out from; this suggests that personal economic concerns may be behind relocation decisions. We also document that this phenomenon mostly exists in firms with poor corporate governance: when firms are closely monitored, personal tax rate drops are insignificant and shareholder announcement reactions are on average positive.

Different from Chapter 2, which focuses on corporate decisions made by top managers, Chapter 3 directly studies personal trading decisions of corporate insiders and documents when those trades are more informative to the investors. The intuition of this chapter is straight forward: corporate insiders have information advantage over outside investors; when insiders trade, their trades impound information into stock prices, and the information content of those trades are higher when firms have more opaque information environments. Consistent with this view, we use price movement after each insider trade to measure insider trading informativeness and find significantly stronger price movement for firms with higher earnings management and lower stock price informativeness. Given the increased debate over insider trading, our findings add to the information incorporation role of insider trading.

In Chapter 4, we focus on characteristics of CEOs and examine whether CEOs' selection by a stellar educational institution can constitute or signal a resource to their firms. It is often argued about whether CEO matters — we show that CEOs graduated from Ivy League schools do add to superior sustained performance of the firm. We further find that Ivy CEOs do better in early career stages, in small companies, and where CEO-relevant undergraduate program-related skills apply, suggesting that an Ivy-connection enhances performance where the CEO has less experience, ample discretion, an especially critical role, and where there is less risk of rent appropriation. Moreover, that more recent graduates do better than those from a prior era suggests that most of the value of an Ivy degree comes from selection or education for talent more than social connections. Our findings suggest that Ivy selected CEOs can indeed be

considered a valuable resource to a firm — our results not only suggest that CEOs matter, but also under what conditions they matter more.

Chapter 2 . Who Benefits from Headquarters Relocations?

2.1 Introduction

Headquarters relocations are among high-profile corporate decisions. With Boeing moving to Chicago and Philips Morris moving to Richmond, relocation decisions of major corporate offices accompany millions of dollars of government tax incentives and grab media attention. These relocations are believed to affect local economies greatly; with high potential costs[1], they may as well affect firm performance in a significant manner. However, little is known about the impact of headquarters relocations. In this paper, we examine patterns around headquarters relocations and address to the question: who benefits from headquarters relocations? We study relocation influences on shareholders, employees, creditors, communities and managers.

Recent decades witness a clear trend that corporation headquarters diverse away from old economic centers and move to relatively medium-sized centers (Holloway and Wheeler 1991; Klier 2006). Those relocations can be costly. In a 2003 example, Philip Morris relocated its New York headquarters to Richmond, with an estimated total relocation costs around $120 Million[2]. Costs related to disruption of operations during the period of relocation can be much higher. Despite high relocation costs, it is not entirely clear what benefits relocations bring.

So why do headquarters relocate? From shareholder's perspective, headquarters relocations may improve firm performance through cost cutting and efficiency improvement.

[1] Potential major relocation costs include searching for and acquiring of the new offices, retention and relocating of the employees, and disruption of operations during the period of relocation.
[2] See Real Estate Weekly March 19th article: "Philip Morris leaving NYC".

Headquarters are not independent profit centers[3]. They provide service functions such as advertising and accounting, and perform coordination duties within firms to ensure operation smoothness (Henderson and Ono 2008). If headquarters function more efficiently in new locations, relocations can increase shareholder values. In addition, relocations may stimulate firm growth by taking advantage of local spillovers. Such spillovers allow faster information exchanges and technological updates, and are especially profound for headquarters (Davis and Henderson 2008).

However, empirical evidence on shareholder valuation increase and headquarters relocations are both limited and mixed. For example, using relocation samples from 1980 to 1988, Alli et al. (1991) document a 1.29% two day abnormal returns when headquarters relocations are announced; Ghosh et al. (1995), Chan et al. (1995) and Cox and Schultz (2008) find no significant announcement reactions on average, except when favourable relocation motivations are announced[4]. Several papers also focus on long term firm performance consequences. Alli et al. (1991) find significant negative changes in operating profit (ROA, ROE) and tax to sales ratio in the year after relocation. However, Chan et al. (1995) find no significant difference in ROE and Gregory et al. (2005) find little evidence of improved operating performance after relocations.

From the evidence in the literature, it is indeed puzzling why many firms relocate headquarters. If shareholder value maximization is the sole purpose of corporations, then it is hard to understand why headquarters relocate in most cases. A possible explanation is that

[3] This is because typical headquarters do not directly involve in revenue creating activities such as production and sales. Such activities are mainly conducted by production facilities located in different areas across the country.

[4] Different reasons are found to lead to favorable stock market reactions. Ghosh et al. (1995) found no stock market reactions, unless cost saving is stated as relocation reasons. Chan et al. (1995) document positive reactions to both cost savings and business expansions. Cox and Schultz (2008) document positive stock market reactions, except when space reasons are given.

relocation decisions are made to benefit stakeholders[5]. Stakeholder view asserts that stakeholder wealth should also be protected when managers make corporate decisions, because their wealth can be hugely subjective to firm decisions. For example, an employee who posits mostly firm-specific skills may find it difficult to pursue new jobs. As firm's actions impact those stakeholders, it is not fair to ignore them when making major corporate decisions (Zingales 2000).

Hence, we take a stakeholder view in relocation analysis. We study relocation implications on shareholders, stakeholders such as employee, creditors, communities, and the decision maker: managers. In fact, headquarters relocations events are particularly well suited for stakeholder analysis because of the underlying link between firm locations and different stakeholders. For example, employees relate to headquarters relocations because staffs that are unwilling to relocate to different cities may be forced to leave their jobs. If high relocation costs increase the amount of leverage and reduce the reselling values of corporate bond, creditors are worse off. Relocation's impact on communities is considered more profound. It is often argued that relocations create growth in new head office locations by bringing more employment opportunities, creating community leadership and charity giving (Klier & Testa, 2001). On the other hand, local governments of locations that lose headquarters are subject to a lot of criticisms because of the perceived "hollowing out" concern that local economy will decline after losing

[5] Although shareholder interest has always been the stated duty of directors, stakeholder's interest seems to be always taken care of in companies' decisions. According to Preston and Sapienza (1990), General Electric promoted stakeholder interest dated back as early as the 1930s. Many states have amended their corporate laws to include stakeholder interest into considerations. According to Wallace (2003), 38 states have legally recognized multiple-stakeholder interests. Autor, Kerr and Kugler (2007) point out that beginning in 1970s, vast majority of US states courts have adopted laws to constrain firms' ability to terminate workers. As well, different states have gradually adapted anti-takeover laws (most notably Delaware) to "protect stakeholder interest". Thus, even though US is considered to be a shareholder oriented country, it is apparently true that its corporate governance practices have stakeholder focus as well.

headquarters. We thus examine whether relocations impact employees, creditors and communities in this paper.

Lastly, we also consider the possibility that relocations are driven by managers' self interests. Because headquarters relocations often accompany the relocations of firms' top management team, the chosen locations must be perceived pleasant for the top management team to live. We consider two possibilities: first, managers may choose to relocate to take advantage of better and safer living environment; at the same time, they may prefer states with low tax burdens to increase their wealth. We examine both factors in this paper.

Our sample covers 222 headquarters relocations in the United States from 1971 to 2008. Comparing relocating firms to their non-relocating peers, we do not find evidence that shareholders benefit on average: both short-term stock market reactions to relocation announcement and long-term firm performance are not significantly impacted by headquarters moving to another metropolitan statistical area (MSA). Further, we find no evidence that wealth of employees and creditors positively relate to relocation decisions. The association between relocations and communities is also not significant. We find no robust evidence on declining local growth rates when MSAs lose headquarters, which does not support the hollowing out concern.

Despite all the surprising findings that shareholders and major stakeholders do not benefit from headquarters relocations, further analysis reveals a consistent pattern that headquarters choose to move to states with lower personal tax burdens (e.g., top marginal tax rates, top capital gains rates and average tax burdens). For instance, the average top marginal personal tax rate in the move out states is around 2.5% higher than it is in the move in states. We also show that low personal tax burdens help to attract headquarters, after controlling for other location characteristics. Our results suggest that, on average, headquarters relocations only correlate with

increases in top executives' wealth. To shareholders and other stakeholders in general, the perceived benefits from new locations do not translate to real consequences. The importance of headquarters relocations in spurring both corporate and community growth is questionable.

Finally, given that headquarters relocations are motivated by personal tax considerations, we explore what kind of CEOs relates to higher personal tax rate drops, and whether corporate governance plays a role in the relocation decision. We show numbers consistent with the idea that highly paid CEOs and CEOs who will not leave the firm soon tend to choose locations with high tax rate cuts. Relocations decisions made by well-governed firms result in higher shareholder values and lower personal income tax rate reductions.

Our contribution to the literature is twofold. First, we provide a stakeholder view in understanding relocation decisions. As far as we are aware of, we are the first to provide a comprehensive analysis of corporate headquarters relocation events, from the perspectives of both shareholders and stakeholders. Second, the study sheds light on policy issues about whether local communities should compete for headquarters. Our results fail to support that adding headquarters benefit, or losing headquarters harm local economic growth.

The remainder of this paper is organized as follows. Section 2.2 describes our sample. Section 2.3 presents shareholder valuation changes around relocations. Section 2.4 studies the changes on employees, creditors, and communities. Section 2.5 focuses on the relationship between relocations and managers. Section 2.6 provides further analysis about relocations, CEO compensation and turnover, and corporate governance. We conclude in Section 2.7.

2.2 Sample

2.2.1 Headquarters locations and relocation patterns

The core of our data is a combination of two lists: one is a hand-collected list of locations of top revenue firms in US between 1971 and 2008 (*Compustat 500 firms*); and the other is a list of location information for US firms between 2001 and 2008, obtained from the Corporate Library database (*Corporate Library Firms*). To construct the first list, *Compustat 500 firms*, we first obtain the top 500 revenue firms from the Compustat database each year from 1950 to 2008. Once a firm is included, we track the headquarters location as long as the firm is covered by Compustat[6]. We then restrict the sample period to 1971 to 2008[7] to ensure the availability of location level data. We collect headquarters locations manually. Each year, Fortune publishes city/address information for Fortune 500 companies[8]. Our sample is matched to the Fortune 500 list and headquarters location information are obtained from the Fortune magazine when available. When we are not able to find the location information from the Fortune magazine, we obtain the information from proxy statements or through Internet searches instead[9]. Our second list, the *Corporate Library Firms* covers on average over 1,500 firms each year from 2001 and 2008. For each of those firms, Corporate library reports headquarters city, state and zip code information. When there is a conflict between city/state and zip code information provided, we drop the firm out of our sample. Once the two lists are constructed, we combine the two lists to create our sample by removing any of the repetitive firm-year observations. The major benefits

[6] We keep the firm in our sample, even if it drops out of the top 500 revenue list in a given year. This is done to ensure continuity (eg. one firm can be in the top 500 list in year t, and then in year t+3; our method ensures that the firm will be followed in year t+1 and t+2).

[7] We start our sample period from 1971 instead of 1950 since BEA (Bureau of Economic Analysis) data only became available since then. The benefit of starting the data sample construction from 1950 instead of 1970 is that it ensure the relative stableness of our sample sizes across years. By keeping a firm in our sample even if it falls out from the top revenue list, the later years tend to have more firms than the earlier years. When we drop the first 20 years out of our sample, the addition rates of the firms are similar to the die out rate and thus, the sample sizes are relatively stable. Year 2008 is used as the final year to ensure the availability of firm level and location level information until year t+3.

[8] Our final sample is similar to the Fortune 500 lists except that: Fortune 500 covers only manufacturing companies before the 1980s; and the Fortune lists include both public and private firms.

[9] To ensure data accuracy, we compare our hand-collected location information with Compustat address information. Compustat provides the current location data of headquarters for each company. We manually match last year's headquarters information that are hand collected in our sample with the Compustat address information to ensure data accuracy.

for inclusion two lists into our sample is that it increases the number of relocations events greatly (Appendix A1 presents a breakdown of combined sample by individual list); and it also allows us to perform analysis for each list separately to ensure the robustness of our results[10].

To identify relocations events, headquarters city/states are then matched to the MSAs that the city belongs to. United States Office of Management and Budget defines MSAs as one or more areas that are centered around at least one major core urban area and has a high degree of social and economic integration[11]. We focus on MSAs, rather than cities or counties, to allow spillovers beyond the city boundary[12]. If a firm changes its head offices' MSA in a given year, we define the firm as a relocating firm. We do not identify within MSA moves.

We also exclude headquarters relocations around M&A events. For example, when Philadelphia based Bell Atlantic and New York based NYNEX merged in 1997, Bell Atlantic relocated to the old NYNEX locations in New York. In this situation, it is hard to identify relocation consequence and the relocation motives can be completely different to pure relocations. We drop them out of the sample. Finally, we exclude firms in financial and regulated utilities industries, and firms with missing assets or pricing data.

Our final sample consists 28,081 firm year observations and 3,312 firms. Among which, we are able to identify 222 cross-MSA relocations (Table 2.1 Panel A). Due to the addition of Corporate Library firms, there is a significant increase in sample size after year 2001. Our sample covers a great proportion of US MSAs - around 250 (out of more than 300 MSAs) have hosted at least one head offices during the 38 years.

[10] Since the analysis results under each of the individual list scenario is qualitatively the same compared to the combined list, we choose to report the results for the combined sample in this paper.
[11] See http://www.whitehouse.gov/sites/default/files/omb/fedreg/metroareas122700.pdf for more information.
[12] Many location studies, such as Strauss-Kahn and Vives (2005), use MSA as geographic unit of analysis.

Table 2.1 Panel B shows the distribution of those headquarters. Headquarters tend to cluster; on average, New York, Chicago and Los Angeles have consistently been the top location choices for US firms. In fact, those three locations have hosted on average around 1/3 of the US headquarters. However, the importance of mega cities such as New York and Los Angeles has been declining during the recent periods[13]. Specifically, New York has the biggest number of net loss (-44) of headquarters among the top revenue firms. The Sunbelt areas, including areas such as Dallas, Houston and Atlanta, have the most number of move-ins. This relocation trend from Rust belt areas to Sunbelt areas is consistent with evidence documented by Klier (2006).

In Panel C, we also show the combinations of move-in and move-out MSAs that have attracted the most numbers of relocations. The only significant pattern is that, a great percentage (19 firms, out of 222) of relocations are from New York to its neighbouring MSA (Bridgeport-Stamford-Norwalk) in Connecticut. We do not find other relocation combinations extremely popular.

[Insert Table 2.1]

2.2.2 Variable constructions and summary statistics

To understand the implications of headquarters relocation events, it is important to identify possible firm level and location level variables that might impact shareholders, stakeholders and CEOs of the firms. We merge in Compustat, CRSP for firm characteristics; location level data are obtained from different US official website (detailed in Appendix A2).

2.2.2.1 Variables for shareholders

[13] Holloway and Wheeler (1991); Klier and Testa (2002); Klier (2006) also document similar trend.

We use several variables to capture shareholders value changes around relocations. We directly capture long term shareholder wealth using tobin's average q (Q), calculated as total assets subtract the book value of equity and plus the market value of equity (price times common shares outstanding), and then divided by total assets. This measure reflects the market evaluation of the prospects of the firm.

We also examine specific costs and performance factors. First, strategic positioning of headquarters locations reduces costs and enhances efficiencies through both improved coordination between headquarters and plant level actions and easier access to headquarters related activities. Our headquarters cost and efficiency measure is sales, general and administration cost (SG&A) scaled by firms' revenue. This variable measures company overhead cost, a big component of which consists of head office costs such as headquarters labour, rental, administration costs, advertising and legal fees[14]. Such costs may substantially differ across locations[15]. One additional costs reduction source is corporate tax savings. Relocations may result in tax savings because of either lower state corporate tax rates after relocations or local tax incentive package provisions[16]. Generally, moving from high tax states to low tax states can directly result in improved tax environment. Or, tax incentive packages such as tax credits or tax breaks, also allow firms to pay lower tax amounts in the following years. We measure corporate

[14] Admittedly, using SG&A as a measure to capture headquarters cost is not perfect since it includes much more than headquarters expenditure. According to Deloitte's report, SG&A should be a better proxy to headquarters cost in a more centralized service model. Regardless, we believe that this is the closest measure we can find to proxy for headquarters cost.

[15] For example, changes in local wage levels and labour markets can result in changes in headquarters labour costs. Metro areas and more populated locations have better and cheaper access to service industries, while costs related to coordination and administration can be relatively high (Ono and Henderson 2008). If headquarters relocations result in cost reductions in terms of lower overhead cost and higher headquarters efficiencies, we should observe reduced SG&A in the years after relocations.

[16] Note that the actual relationship between headquarters locations, state corporate tax rate and tax expenditure is complicated. The norm is to pay taxes to the state where the business income is generated and there is often a division formula among all the states in which the corporation is doing business. However, certain items are usually allocated to headquarters state for taxation, especially nonbusiness incomes (e.g. interest earnings on a pool of cash held for future corporate acquisitions).

tax using tax expenditures scaled by pre-tax income, similar to Ali et al. (1991) and Gregory et al. (2005)[17].

Second, the idea that location matters to firm performance relies on the notion that locations can provide positive agglomeration externalities[18]. Performance increases come from information spillovers such that firms learn from each other. Such a dynamic view predicts that relocations may benefit firms through more extensive technological and idea sharing in the new location. We examine whether relocations improve operating performance and productivities using return on asset (ROA) and total factor productivity growth (TFP growth) after relocations. We calculate ROA as net income divided by total assets. To calculate TFP growth, we assume a Cobb-Douglas production function that allows labour and capital to have different impacts on output: $Y=TFP*K^{\alpha}*L^{1-\alpha}$. Thus, TFP growth is measured as the residual of firms' output growth rate (measured as Δlog revenue growth) net of growth accounted by capital (Δlog PP&E) and labour (Δlog employee numbers). We assign $\alpha = 0.3$ for capital share following King and Levine (1993). Robustness checks are conducted by allowing estimates for α for different weights ranging from 0.2 to 0.4. Greenstone et al. (2010) document a positive TFP spillover when a neighbouring plant was opened in a county.

2.2.2.2 Variables for stakeholders (employees, creditors and communities)

We also use several variables to capture stakeholder wealth changes. We measure employee benefit using employee number changes and creditors wealth using both average firm

[17] Ali et al. (1991) scale the tax expenditure by sales, and Gregory et al. (2005) scale the tax expenditure by pre-tax income. Scaling by sales yields qualitatively similar results.

[18] There are a lot of literatures emphasizing the positive externalities within a location. Marshall (1920) is generally credited with providing the earliest discussion of such local agglomeration economies. Other literatures in this area are (list not complete): Glaeser, Kallal, Scheinkman and Shleifer (1992), Rosenthal and Strange (2001), Glaeser & Gottlieb (2009)

credit ratings and leverage. If relocation events relate to employee layoffs, we would expect a reduction in employee numbers afterwards. Leverage ratio is calculated as the sum of long-term and short-term debt scaled by total assets. Firm level credit ratings are S&P's long-term ratings at issuers' level. Higher ratings correspond to lower score values (e.g. AA+ have a score of 4 and AA have a score of 5).

To capture community growth rate changes around relocations, we define four measures of MSA prosperity: population growth, employment growth, per capita income growth and private business growth (Glaeser et al. 1992). Each of the growth measures are calculated as the difference between local characteristics of year t and year t-1, scaled by the value of year t-1. Population, employment and income data are from BEA, while private business data is from Census.

2.2.2.3 Variables for managers

Finally, managers' interests are captured by living environment and personal tax burdens. We measure whether a city is pleasant to live in using both violent crime rates that measure location safety, and natural amenity scores that capture natural living environment (Gottlieb 1995; O'Mara 1999[19]). Natural amenity scores are available from the Department of Agriculture and are reported as the average environmental quality from year 1941 to 1970 for each county. This score ranges from 1 to 7 and aggregate important factors such as warm winter and summer temperature. The higher the natural amenity score, the better the weather conditions. We take the

[19] O'Mara (1999) studies relocation decisions by interviewing executives of 40 companies. The survey results show that "the economic development incentives are less important than the ease of living". Gottlieb (1995) studies the location patterns of firms in municipals of northern New Jersey and finds crime rate to be a significant disamenity of region.

average of county level natural environment scores to calculate the natural amenity scores for MSAs. To measure location safety, we use the number of violent crime cases divided by MSAs population. Crime data is obtained from Bureau of Justice Statistics, and is available after 1980.

Executives prefer low tax states, which can effectively increase their after-tax income. We rely on three different measures to proxy for personal tax burdens in a state. First, we obtain the highest marginal individual income tax rate for each state from the University of Michigan world tax database and Tax Foundation. Highest marginal tax rate is used because most of the executives fall into the highest tax bracket. This makes highest marginal tax rate the most relevant in our analysis[20]. Second, we obtain the maximum capital gains rate from Taxism. There is no readily available capital gains tax rates for each state. Thus, we rely on NBER Taxism, which simulates state capital gains rate for top income bracket starting from year 1977. We also use a third measure--personal tax burden obtained from Tax Foundation. This tax burden measure is calculated as the total amount of taxes paid by the state residents, divide by the state's total income. This measure is an aggregate tax burden measure, which contains not only income taxes, but also other important tax perspectives such as sales taxes and property taxes.

2.2.2.4 Summary statistics

Table 2.2 reports summary statistics for the data, for both the entire sample (Panel A) and the relocating firm-years (Panel B). Broadly speaking, the relocating firms have lower ROA in the year of relocation comparing to the entire sample. The median population of the MSAs

[20] To ensure the accuracy of this analysis, we also try using the Taxism software provided by NBER. This software allows us to calculate the tax payable to state for each individual, once income and other information is entered. Without further information on individuals, we tried calculating the income payable for years around relocations, assuming married couple and no other income source besides total compensation reported by Execucomp. The resulted effective tax rate under this assumption is in fact very close to the top marginal personal income tax rate.

covered in our sample is 3.24 million, while the median population for the MSAs that headquarters move to is only 2.62 million. This is consistent with the observation that firms are moving to smaller population centers. Panel C and Panel D presents correlation matrix for firm level and location level variables. Correlation matrix shows that the three personal tax measures have correlations ranges from 0.66 to 0.9. Employment, income and private business growth rates are also positively correlated with correlations ranges between 0.27 and 0.62.

[Insert Table 2.2]

2.3 Relocations and Shareholders

It is widely acknowledged in the United States that the principle of any business decisions is shareholder value maximization. For headquarters relocation decisions, managers often state that the moves are strategic for firms' growth. In this session, we assess the shareholder valuation consequences of headquarters relocations, linking relocations to stock market reactions and long-term firm performance changes.

2.3.1 Stock market reactions

If stock market is efficient and relocation news are unknown to the public prior to its announcement, we would expect stock market react to the news announcement positively if relocations are beneficial to shareholders on average. Otherwise, either a negative reaction or no reaction should be found.

To estimate the stock market reactions to relocation announcement, we first use Factiva news searches to identify announcement dates for our relocating events. The search results in

127 cases of relocations in total[21]. We use the market model (with value weighted market returns) to estimate stock betas in a -300 to -46 event day window before relocation announcement. We then use the estimated betas to calculate daily abnormal returns.

Table 2.3 Panel A reports cumulative abnormal returns (CARs) for seven different windows around the relocation events, where event day 0 represents the announcement date. We choose event window starting from two weeks before relocation announcement (day -10) to two weeks after relocation announcement (day 10). Days before event days are included in case there is information leakage before announcement. For each event windows, we report t test results for mean and Wilcoxon signed-rank tests for median. Our results show no statistically significant CARs for all windows. The magnitude of cumulative abnormal returns is always lower than 1%: ranges between -0.2% (AR[0]) and 0.8% (CAR[-5,5]). This suggests that on average, stock market do not show strong positive reactions to relocation announcement.

Finding no evidence on short-term announcement reaction does not support the idea that relocations benefit shareholders. In an efficient market, stock market should incorporate good or bad news into stock prices at news announcement. However, it is always interesting to test long-run implications of the relocation impact and see whether our short-term stock market findings also hold true for long-term firm performance after relocations.

[Insert Table 2.3]

2.3.2 Long-term firm performance

To examine shareholder valuation changes around relocation years, we define the relocating year as event year 0 and then compare the average performance differences in the

[21] The loss of sample are resulted mostly from the fact that Factiva coverage is not good until the late 80s; and for many of the small firms, relocation announcements cannot be properly identified.

three years after relocations and three years before relocations. Three-year-window is chosen to capture the long-term realizations of possible relocation benefit. In the ideal empirical setting, we would want to compare the performance changes of the relocating firms, to the scenario had the firm not relocated at first place. However, since the "non-relocating" scenario for the relocating firm is not observable, we must find firms that are similar to the relocating firms, but have not relocated during the same years.

A natural starting point is to compare performance changes for relocating firms to their industry peers to exclude any performance changes that are driven by industry shocks. We benchmark the performance difference by 1) industry median (Fama French 49 industry) and 2) an industry-size matched firm that has never moved[22] during the three-year relocating window [-3, +3]. To ensure the quality of our match, we restrict the matched sample to be within 30% of total asset to the relocating firm. In the first two sections of Table 2.3 Panel B, we report both industry median adjusted and size matched firm adjusted performance changes. Results show no significant changes in long-term shareholder value after relocations. Comparing to their industry benchmarks, Q, ROA and TFP growth exhibit no statistically or economically significant differences after relocations. Median tests report numbers around 50% for most of the variables, which suggests that around half of the relocations indeed negatively relate to ex-post performance. Further, we find no evidence that costs related variables--SG&A and corporate tax significantly decline after relocations.

Industry adjusted performance changes would be sufficient if the relocation event is purely random. That is, if every firm in an industry have similar probability of relocating their headquarters in a given year, our previous approach would be sufficient to assess the relocation

[22] This restriction only applies to firms that have location data.

effect. However, this may not be true for our data. In fact, when we include performance variables, such as last year's ROA into a regression to predict headquarters relocation, we find significantly lower ROA for the relocating firms comparing to all non-relocating firms (logit model in Appendix A3 Panel A). This is to say that relocations decisions are made, partially dependent on past performance of the firm. To control for this tendency, we use a propensity score matching approach to match our sample firms to non-moving firms that are in the same industry in a given year, and that have similar probabilities of moving. First, we run a logit regression on all observations of moving and non-moving firms in our sample. The dependent variable equals to one if a firm moved its head office in a given year and 0 otherwise. We then use last year's Tobin's q, firm size, ROA, and firm age to control for firm characteristics and performance difference in the pre-move year. We also include year and industry dummies. Next, within each year and industry, we choose a non-moving firm as a match to the relocating firm based on their predicted scores. Non-moving firms that have the closest scores[23] to the moving firms are then chosen. By construction, this match firm is perceived to have the closest probability of relocation compared to the actual move firm. Thus, we use the match firms' performance changes to proxy for the unobserved performance changes of the move firms had they not moved. As an additional robustness to address location differences between the move and match firm, we also include a stricter test to restrict the match firm to be in the same location as the move firm in year t-1. We trust the matching quality is on average satisfactory: we show that in general, there is no statistical significant difference in the average pre-move characteristics for the move firm and their matched peers (Appendix A3 Panel A). The performance consequences relative to the propensity score matching peers are again presented in

[23] We only keep matching firms that have predicted scores within 0.1 of the moving firms.

Table 2.3 Panel B. Similar to industry-median and industry size adjusted results, we again show no significant changes in terms of costs, growth and performance after relocations.

We perform several robustness tests. First, we use multivariate regression analysis to examine the relationship between move and long term performance changes. Multivariate regressions allow us to control for both lagged and contemporaneous factors that may impact relocation consequences. In Appendix A4 Panel A, we report regression results comparing the move year performance changes to performance changes for both non-moving firms and firms in non-moving years. We use three-year changes around the relocation year as our dependent variable. The variable of interest is the move dummy—whether a firm is relocating in a given year. We control for lagged total assets (log), lagged book to market ratio, three-year changes in firm size and leverage, and industry and firm dummies. Standard errors are clustered by industry. We show no statistical significant results of the move dummy on three-year performance changes.

Second, due to the initial cost of relocations, relocations may not benefit headquarters until a longer time range, instead of a three-year window. To rule out the possibility that longer windows are needed for relocation benefit to be realized, we tried using five-year window, as well as firm fixed effect regressions with dummy variables representing all years after relocations. We do not observe that firms better perform in the years after relocations.

Finally, we also use alternative firm level variables. We test for other cost and efficiencies measures such as operating efficiency, labour productivity and capital productivity. To see whether relocations help equity raisings, we examine external equity issuances around relocation years. In addition, we also look at changes in return volatility, earnings volatility,

investments, asset growth, institutional ownerships and dividend payouts. In general, we find no significant differences in those variables around relocation years.

Overall, our results suggest that on average, shareholder values do not increase after headquarters relocations. Given that we find no evidence that corporate headquarters relocation decisions are made to benefit shareholders, shareholder value maximization does not seem to be the purpose of corporate relocations.

2.4 Relocations and Stakeholders

The common wisdom in the field of finance emphasizes the idea of shareholder primacy: firms should be run in the interest of shareholders. According to this view, stakeholders' benefit, such as community growth, employee and creditor wealth, do not need to be considered. Conversely, in the stakeholders view, people emphasize the concept that managers should attend to all stakeholders without prioritizing one over another (Freeman 1984). This view asserts that parties such as employees, creditors, and communities all have significant stakes in a firm and help to grow the firm. Thus, they should also be taken into considerations in managers' decision-making procedures[24]. We apply the stakeholder view and show how different stakeholders might be influenced by headquarters relocations.

2.4.1 Employees and creditors

[24] Stakeholder view gets popular and is formalized in US through Harvard Law Professor Merrick's 1932 debate with Yale Professor Adolf Berle. Dodd argued that company should be responsible for their major stakeholders—shareholder, employees, customers and general public, while Berle insisted on the shareholder view. It is after 20 years later when Berle changed his mind and agreed with Dodd's stakeholder view. Stakeholder view has been quite popular among business leaders. In a survey work (Raymond 1968) in asking whether executives act only in the interest of shareholders, more than 80% of the respondents assert the unethicalness of the shareholder only view. The stakeholder view has since then gained more popularity. Especially after the collapse of Enron and WorldCom, shareholder primacy as the sole corporate objective has been questioned.

It is possible that corporate decisions impact employees and bondholders. Asserting that shareholders gain at the expense of employees, Shleifer and Summers (1988) in their hostile takeover study claim that:

"…[T]akeovers that limit managerial discretion increase the acquired firm's market value primarily by redistributing wealth from corporate stakeholders to share owners. …When a hostile acquisitor cuts off their investments, the shareholders gain…[and] the gains come at the expense of the employees' employment and wage losses."

Pontiff, Shleifer and Weisbach (1990) study post hostile takeover behaviors and notice reversion of excess pension assets after takeovers. They conclude that replacing existing pension plans with new ones is one potential source of employee loss after hostile takeovers. In terms of bondholders, Warga and Welch (1993) document on average between 6% and 7% losses of bondholders on a leverage buyout announcement, mostly because of the increase of leverage upsurges the riskiness of the debt and greatly reduces the current value of the bond.

It is possible that relocations also adversely impact employees and creditors. Relocations can relate to employee downsizing. Relocations of headquarters often require closing downs of old head offices. Thus, staff in the original headquarters may be forced to resign when they are reluctant to move the entire family to new regions and when they are unwilling to switch to new positions. For bondholders, if the high cost of relocations increases leverage, the creditors deteriorate afterwards.

[Insert Table 2.4]

In Table 2.4, we compare log employee numbers for the three years before relocations and three years after relocations, controlling for the performance changes of the matched groups. The matching group is constructed similar to the previous section. For bondholders, increasing

leverage and deteriorating credit ratings also imply lower debt values and is considered unfavorable. Our results show no significant changes for both leverage ratios and credit ratings, which suggests that relocations do not seem to benefit creditors as well. The change in leverage is less than 1% comparing to its industry peers, again both statistically and economically insignificant. We again confirm our results in appendix A4 panel B when we use multivariate regressions as robustness checks.

It is relatively harder to evaluate the wealth of employees. Employees care for their job securities (i.e. whether they have a job) and their economic wealth. We rely on the change of employee numbers to see whether relocations decisions may accompany employee-cutting behaviors, which are perceived to be undesirable for current employees. We do not find robust evidence that employee numbers reduce after relocations. Employee numbers drop significantly comparing to their industry size matched peers; however, when we control for the probability of moving out, the drop in employees are no longer significant. Thus, it is likely that employee cuttings will happen even if the firms stay in the old location—that is, it might be the poor firm performance or general local environment that results in employee cutting, not the relocation. Another important aspect to assess employee wealth changes is the net income difference of headquarters staff before and after relocations. Ideally, it is desirable if average salary of the headquarters staff can be obtained—however, we are not able to obtain such data. Instead, in undocumented results, we examine the difference of *median* household tax rate[25] for the move out and move in location and find no statistical difference between median income tax rates for the two locations. This again supports that relocations do not have significant implications for employees.

[25] In later sections, when we study the impact of relocations on top management teams, we use the top marginal tax rate, instead of the median tax rate. This is because the top management team usually consists with highly paid individuals, thus it is more appropriate them to assign them the top income tax rate. However, for an average employee, we use the median tax rate for the location instead.

2.4.2 Communities

One important stakeholder often neglected in corporate decision analysis is community. Yet the impact of headquarters relocations on communities is important to both local investors and politicians. When Seattle labor unions, government officials and Boeing-related businesses whined at their loss of Boeing, city of Chicago and state of Illinois happily spent around $60 million in tax breaks and various grants to attract Boeing over Denver and Dallas. Do headquarters relocations make such a big difference to MSAs?

Cities and regions have huge differences in living standards. For example, per capita income ranges from $27,028 in the state of Mississippi to $57,746 in Washington DC in 2006. The differences measured at the city level are even greater. Cities develop through internal spillover effect. Urban economic literatures have well documented that cities grow because of the agglomeration benefit when people gather together. The idea is that cities provide environments for people to interact and create efficient information spillovers. The information spillover may facilitate regional growth in two ways. First, regions grow because information spillovers allow better allocation of resources in terms of both labour and raw materials (Black and Henderson 1999). More importantly, easy flow of ideas promotes intellectual breakthroughs and hastens the adoption of innovations (Glaeser et al. 1992).

Hosting headquarters are perceived to be beneficial. Large corporate headquarters create local employment opportunities directly. Headquarters also create additional jobs in related industries such as finance and legal. Famous headquarters attract attention for their regions, and thus generate additional investment opportunities, job opportunities, human capital migration, and incubate new businesses (Glaeser and Gottlieb 2009). Such agglomeration of human capital

creates knowledge spillovers, which are perceived the "engines of growth" (Romer 1986, Lucas 1988).

Thus, how to attract and retain headquarters becomes a big concern of local governments. Politicians worry about losing corporate headquarters and welcome the addition of headquarters to their jurisdictions. Media refers to this concern as the "hollowing out" effect, where losses of corporate headquarters are perceived to harm the local economy. Local governments offer millions of dollars incentive packages to attract or retain headquarters so that hollowing out does not happen to their communities. Takeover defenses were set up to prevent corporate headquarters to become local branches. Given all those tax packages and takeover defenses, the real consequences of headquarters relocations, however, are never clear. In this section we aim to examine community growth rate changes around relocations.

To test this, we calculate the net number of headquarters relocations for each MSA every year. We denote MSAs as net move-in regions if headquarters move-in numbers are greater than move-out numbers in a given year. If move-in numbers are lower than the move-out numbers, we classify the MSAs as net move-out regions[26].

In Table 2.5, we report the means and medians of community growth rate changes for the net move-in MSAs and net move-out MSAs. Similar to previous sections, changes are calculated as the 3-year average after relocations minus the 3-year average before relocations. Annual US average growth rates are subtracted from community growth rates to adjust for general economic environment. Since the decision to move out of / move into a location are not randomly made, we control for location characteristics difference by first matching each of our net move-in and

[26] One concern is that moves from firms in finance or utility industries, or moves related to M&A should also impact local communities. Thus, we perform robustness checks by adding those firms back when we calculate the MSA-year net relocation numbers. Results stay qualitatively similar.

net move-out MSAs to a similar sized MSA that did not attract or lose any head offices in the three years before and after the relocating years. We restrict the matched MSA to have the closest population[27] to the location of interest, and within 30% population difference.

In addition, we conduct propensity score matching to match each of our net move in and net move out MSAs to MSAs that have the closest probability of attracting and losing headquarters (model in Appendix A3 Panel B). We are hoping to isolate the real effect of relocation this way, because the move in and move out MSAs may be fundamentally different to other MSAs. To predict the probability of attracting (losing) headquarters, the regression dependent variable equals to one if the MSA is a net move in (out) region in a given year. We control for local spillover factors using percentage of finance and service industry employment, and number of existing headquarters; and we control for cost factors using top marginal individual and corporate tax rate[28]. Once the regression is run, we match each of our move in (out) MSA to a non-move in (out) MSA that have the closest predicted score in attracting (losing) headquarters. We then compare the local growth difference between the move in (out) MSAs with their matched peers.

[Insert Table 2.5]

Table 2.5 Panel A reveals that on average, there is no statistically significant increase in population, income and private business growth rates for net move-in MSAs. About 57% of the MSAs increase in their employment growth rate; however, the mean difference of the growth rate difference is less than 0.3% and is not economically or statistically significant. In Table 2.5 Panel B, we also show that MSAs that lose headquarters do not underperform US average, similar sized MSAs, or MSAs that have similar probabilities of losing headquarters. As a

[27] We also tried match by population/income and results are similar.
[28] We will talk more about those variables in the next section.

robustness check, we also report multivariate regression results (Appendix A4 Panel C) controlling for additional factors such as number of existing headquarters in location. We use both the number of move in headquarters and the total market value of the move in headquarters as variable of interest. The regression results again confirm that attracting headquarters do not benefit local growth more than not attracting or losing headquarters.

To conclude, our results suggest that on average, headquarters relocations are not related to valuation improvement for creditors, employees or communities. If headquarters relocations do not benefit both shareholders and stakeholders, who benefits from those relocations? We next examine the valuation implications of relocations on managers.

2.5 Managers

As any other corporate decisions, typical agency problems can occur. Managers may choose to pursue their own goals rather than firm's interest. Since relocations often require executives and their family members to move and adapt to a new city, sell and buy houses and change their social circles, executives' lives can be greatly influenced by relocations. When Boeing announced their headquarters relocation from Seattle, much attention has been emphasized on executives' interests. As noted in the press, "much of the time was spent talking about the things Boeing said it most wants: a city that offers fulfilling lives for the executives' families"[29]. Since top managers are the ones to make the relocation decisions, changes on executive benefits are particularly intriguing and are the focus of this section.

2.5.1 Living environment and personal tax rates, univariate

[29] See Chicago Tribune daily newspaper, April 20th, 2001 Issue.

We consider two perspectives to be important for managers: first, we test whether executives choose to move to locations with better living environment: i.e. better natural amenity scores and lower crime rate; second, we test whether executives are economically better off after relocations: i.e. move to states with lower tax rates.

[Insert Table 2.6]

Our first step is to directly compare the living environment and tax rates between the move in and move out locations. In Table 2.6 Panel A, we first compare whether headquarters on average relocate to locations with better living environment. We find no evidence that managers relocate to safer environments. Comparing to old MSAs, new MSAs have lower natural amenities scores, which is exactly opposite to what we were expecting.

When we compare personal tax rates among locations, our results show that all personal tax burden measures (i.e. top marginal rates; top capital gains rates; average tax burdens) drop significantly after relocations. The average move out state's top marginal individual tax rate is 7.06%, which is 2.57% higher than the average top marginal individual tax rate in the move in states; 66% of the firms are moving from high top marginal personal tax rate states to low top marginal rate personal tax states. Using average tax burden and top capital gains rates reveal similar patterns. To avoid the possibility that our findings are driven by the 19 moves from New York to Connecticut, we also perform robustness checks by dropping out those 19 moves. The decrease in personal tax rates is still significant. Given that the average total compensations of a big firm CEO is around 11.5 million in year 2000, our results suggest average savings in personal income taxes of around $300,000.

2.5.2 Multivariate regressions

2.5.2.1 Personal tax considerations and location choices

In this section, we address the question whether managers *choose* to relocate to states with low personal tax rates. Personal tax rates are correlated with other location level variables. Hence, we want to show that not only managers benefit from lower personal income taxes after relocations, but also managers actively consider personal tax rates as important factors in new headquarters' location choices. We use multivariate regression techniques to show that personal tax rates matter even after we control for other location factors.

Our regression model is as follows. Firms face many potential candidates when they make relocation decisions. We assume that every relocating firm can choose from all MSAs that have held at least one head office in a given year[30]. We use a variable CHOSEN to denote whether a MSA is eventually selected. CHOSEN equals to 1 if the MSA is the new headquarters location and 0 otherwise. Our variables of interest are differences in top marginal personal income tax rates, differences in average tax burdens and differences in top capital gains rates. Differences are calculated using tax rates in the candidate locations subtract the rates in the move-out headquarters locations. Other location characteristics differences are used as controls. Year dummies are included. Our logistic regression model follows the following specific form:

$$\text{Chosen}_{i,t}=\beta_1 \Delta\text{Personal Tax}_{i,t-1}+\beta_2 \Delta\text{Controls}_{i,t-1}+\text{Year Dummies}+\varepsilon_t$$

i stands for relocating firms and t stands for year of the relocations.

[30] We only include MSAs that have held at least one head office during the same year as potential choice locations since prior research show strong special concentration of headquarters. For example, Shilton and Stanley (1999) show that 40% of all corporate headquarters are located in only 20 counties. We consider the likelihood of a MSA that did not hold headquarters to win over headquarters is very small and choose to exclude them.

Control variables include factors that may influence relocation decisions. Because top marginal corporate tax rates and top marginal personal tax rates/personal tax burdens/top capital gains rates have correlations of between 0.53 and 0.75 in our sample, it is important to control for differences in corporate tax rates to rule out the possibility that the observed reduction in individual tax rates are driven by corporate tax rate changes. We also control for population, wage, service and finance employment. Those variables proxy for the cost and spillovers concerns and are also used in Strauss-Kahn and Vives (2009)[31]. Natural amenity scores and crime rates are included to reflect living conditions changes. In addition, we include changes in percentage same industry employment, as well as the distance of relocation. Distances are calculated by converting the longitude and latitude differences between the new and old MSAs to kilometers. We obtain the longitude and latitude information from ICPSR.

Table 2.6 Panel B presents logit regression results. We find strong evidence that managers choose to relocate to states with low personal tax rates, using top marginal income tax rates, average tax burdens and top capital gains rates as income tax measures. The impact of personal tax rates is economically significance: a 1% increase in individual income tax rate/capital gains rate corresponds to about 5% (odds ratio=0.948/0.953) drop in headquarters attractiveness. A 1% increase for tax burden will result in almost 20% drop in headquarters attractiveness. Our results suggest that individual tax rates are in fact important concerns when managers choose where they want to relocate their headquarters.

2.5.2.2 Personal tax considerations and MSA attractiveness

[31] We also tried controlling for other location characteristics such as industry herfindahl, crime rate, airport, location demography and etc. Many of the variables have high correlations with each other: e.g. airport and population etc. Personal tax rates remain significant.

We also consider whether lower individual tax rate correlates to higher numbers of headquarters move ins next year. Specifically, our panel is constructed at location-year level and we use location characteristics in year t-1 to predict the net move numbers in year t. Dependent variable is the net move in number of headquarters each year in a given MSA. A positive number means a net move in, while a negative number means a net move out. Each regression is clustered at state level and year dummies are included. Our regression follows the subsequent form:

$$Net\ Move\ Ins_{j,t} = \beta_1 Personal\ Tax\ Rate_{j,t-1} + \beta_2 Controls_{\ j,t-1} + Year\ Dummies + \ \varepsilon_t$$

where j stands for individual MSAs and t stands for year. We also report results adding state fixed effect into the regression. Adding state dummies allows us to examine whether a within state increase in personal income tax rates correlates to lower headquarters attractions.

Table 2.6 Panel C presents the regression results. The regression results confirm that locations with lower personal individual state tax rate, average tax burdens and capital gains rates attract headquarters better. This result generally holds true with and without the state dummy. Our results again suggest that individual tax rates are important factors for locations to attract headquarters.

To sum, examining headquarters relocations and managers' wealth reveals that headquarters relocations benefit corporate managers. Executives benefit economically through significant lower personal tax rates after relocations. Further, lower personal tax rates help attract headquarters to a region.

2.6 Further Analysis

The results of previous sections suggest that relocations benefit managers rather than shareholders or stakeholders of the firm. In this section, we explore the events further and ask the question: 1) when do managers care about the personal tax rate drop more; and 2) when might the relocation decisions increase shareholder values? Unlike the previous sections that document the average effect of a relocation event, this section focuses on sub-samples of relocating firms.

2.6.1 When does personal tax rate matter more?

One natural extension to our study is to see what types of managers care more about tax rate drops. Specifically, we focus on CEO related factors because they tend to have the most power in corporate decision-makings. If our personal tax rate story is true, then one would expect that two types of CEOs should care more because their economic wealth tend to be impacted by the relocation decisions stronger: CEOs with higher pre-tax compensations and CEOs that stay with the firm longer. In Table 2.7, we test whether this is indeed true.

[Insert Table 2.7]

We rely on subsample analysis to test the hypothesis. We first inflation adjust the total compensation of CEOs (TDC1 obtained from Execucomp, available after year 1992) to 2005's dollars. We define high compensation CEOs as CEOs whose inflation adjusted compensation are over 5 million (top quartile); the low compensation group, on contrast, have compensation at the bottom quartile (lower than 1.8 million). In Table 2.7 Panel A, we show that personal tax rate drops are only significant among the high compensation group. For the low compensation group, the average changes in all three personal tax rate measures are negative, yet the magnitude is much smaller. This is consistent with our hypothesis that CEOs with higher pre-tax compensation should care more about tax rates in new locations.

In Table 2.7 Panel B, we also report statistics for CEO turnovers around the relocating years. Specifically, we examine number of CEO turnovers in the three years before and after relocations. If personal tax reductions are the reason behind relocations, then one will expect those CEOs who just join the firm to care more about the relocation decisions than those CEOs who will leave soon. Consistent with this hypothesis, CEO turnover numbers are much higher in the years prior to relocations (71 versus 13). We also document that personal tax rate drops are mostly driven by CEOs that are relatively new to the firm.

To sum, both findings that highly compensated CEOs and CEOs with less probability of leaving the firm tend to relocate to lower personal tax locations are consistent with the idea that CEOs choose to relocate to locations to benefit themselves.

2.6.2 Whether corporate governance helps?

Effective corporate monitoring has been shown to limit managers' discrepancy behaviours and increase shareholders valuations (Shleifer and Vishny 1997). So far, we documented that relocations are events that do not benefit shareholders. Is it true for all firms? Does better governance prevent managers from making decisions that do not increase shareholder values? To answer this question, we distinguish between well governed and poorly governed firms.

We use GIM score to proxy for how well the firms are monitored by the takeover market[32]. GIM is a measure developed by Gompers, Ishii and Metrick (2003) by combining 24 anti-takeover provisions that restrict shareholder rights, such as staggered board provisions that

[32] We also tried entrenchment index (E-index) as an alternative governance measure and considered using high/low managerial ownership to partition the sample. Results using this alternative measures are similar to using GIM.

prevent board replacement and poison pills that makes the firm highly unlikely to be taken over. Thus, High GIM scores represents more anti-takeover provisions in a firm and indicates poor governance. Low GIM suggests that the firm is well governance and represents better monitoring from the takeover market. One restriction is that GIM is only available for a subset of firms after the 90s. As a consequence, our sample size is greatly reduced.

We partition the sample according to median GIM score of the relocating firms. Table 2.8 Panel A reports stock market reactions for high GIM firms (poorly governed firms) and low GIM firms (well governed firms). In all event windows except day 0, our results show positive stock market reactions for low GIM firms. In fact, the stock market excess returns are around 4% for the five to ten day window when well-governed firms announce headquarter relocations. This indicates the market's approval of relocation decisions when managers are monitored closely. However, for the group of firms whose corporate governance practice are below median, we do not find significant stock market reactions after relocation announcement.

We also test whether the increase in shareholder valuation in better governed firms correspond to lower personal tax rate drops. This should be true if better-governed firms increase shareholder value through limiting managers' power to choose locations that only benefit themselves. In Table 2.8 Panel B, the partitioned results suggest that, only poorly governed firms have significant drops in personal tax rates. Therefore, our evidence is consistent with the idea that closely monitoring of corporate managers benefits shareholders and limits the abilities of managers to make self-interested decisions.

[Insert Table 2.8]

2.7 Conclusion

Using US corporate headquarters location data, we study the underlying motivations and valuation implications of headquarters relocations events and find evidence that relocations decisions are only made to benefit top managers. To reach this conclusion, we first study the valuation changes of shareholders, employees, creditors and communities around the relocations events and surprisingly find no valuation increases for those major parties after headquarters moves. However, further exploring the data suggest that relocations on average benefit managers through a reduction in personal tax rates after the move. We continue to show that this drop in personal tax rates is indeed an important consideration when managers make relocation decisions, especially when they have longer expectations to stay with the firm and when their compensations are high. Finally, we find some evidence that corporate governance may limit managers' ability to make self-interested relocation decisions; relocations can benefit shareholders when relocating firms are well governed.

Unlike a typical agency problem, our findings seem to suggest that relocations are on average pareto improvement. CEOs are better-off afterwards; yet nobody are found to suffer. Thus, disregard all the times and troubles involved in headquarters relocations, should relocations decisions be approved all the time? The answer to this question ties back to the fundamental question on corporate governance: if shareholders wealth are the only focus of the firm, then probably it is really indifferent for the headquarters to move or not. Otherwise, all stakeholders need to be taken into properly consideration.

Results in this paper also have some policy implications. For instance, our results suggest that efforts to retain corporate headquarters may not be economically justified. Losing major

headquarters often cause panic in local communities. However, our results do not provide empirical evidence supporting this hollowing out concern.

Chapter 3 . Firm Opacity and Insider Trading Informativeness

3.1 Introduction

Opaque firm information increases information asymmetry between managers and investors and thus affects firm valuations (Francis et al. 2005; Aboody et al. 2005; Francis et al. 2008). In firms with high opacity, insider trades may serve as an alternative information channel as they impound managers' private information into stock prices. Using the return predictive power of insider trades as the informativeness measure, this paper studies whether insider trades are more informative in firms where other information channels fail to work properly, e.g., firms with high opacity.

When corporate insiders trade their own firms' stocks, significant price movements are observed afterwards (Jaffe 1974; Seyhun 1986); however, the magnitudes of subsequent price movements vary across different-sized firms and insider groups (Seyhun 1986; Lakonishok and Lee 2001). One plausible explanation is insider trades impound information into stock prices (Leland 1992; Aktas et al. 2008); therefore, in firms with higher information asymmetry between managers and investors, insider trades are more informative and can better predict future returns (Frankel and Li 2004).

Despite the growing number and importance of insider trades, empirical evidence on the relation between insider trading informativeness and information asymmetry has been limited. Small firms (Lakonishok and Lee 2001) and high R&D firms (Aboody and Lev 2000) are linked with high insider trade informativeness. Frankel and Li (2004) use three information asymmetry measures, and only one measure (analyst following) is associated with insider profitability.

Huddart and Ke (2007) use six conventional information asymmetry measures, but only two of them ("whether firms report R&D" and "median absolute abnormal return over past earnings announcements") are significantly associated with insider trading informativeness.

In this paper we study two significant sources of firm opacity that are largely neglected in previous studies: earnings management and firm-specific return variation. Both of our opacity measures are intuitively related to insider trading informativeness. Earnings management makes financial reports opaque, and thus exacerbates information asymmetry between managers and investors. As a result, informational content in insider trades become more valuable and precede greater price movements. Earnings management includes accruals management and real activities management. Accruals management, measured by discretionary accruals, is well documented in accounting literature and is found to obscure information about firm fundamentals (e.g, Sloan 1996; Xie 2001). In a closely-related paper, Aboody et al. (2005) find that accruals management is associated with higher cost of capital and insider trading profitability. Similar to accruals management, real earnings management also adds to financial report opacity. Real earnings management includes manipulating SG&A or R&D expenditures to inflate earnings, and overproducing inventory to lower cost of sales, etc. (Rowchowdhuary 2006). Real earnings management affects both earnings and cash flows and may cause even greater distortion in assessing firm fundamentals. For example, Cohen and Zarowin (2010) find that real earnings management causes greater mispricing than accrual earnings management in an SEO setting. Survey evidence shows that real earnings management is prevalent (Graham et al. 2005) and grows more popular after Sarbanes-Oxley Act (Cohen et al. 2008). Since earnings no longer truly reflect firm fundamentals, both accrual and real earnings management make financial reports opaque and thus make insider trading, an alternative information source, more informative.

Another measure of opacity is firm-specific return variation (inverse log transformation of R^2), which measures the return variation that cannot be explained by market-wide macroeconomic information. Since Morck et al. (2000) first use firm-specific return variation as a measure of stock price efficiency, there has been a growing literature on firm-specific return variation as a measure of firm opacity. Jin and Myers (2006) develop a formal model which links high opacity to low firm specific return variation. They show that reduced information to investors decreases firm specific return variation by shifting firm-specific risk to managers. Firms with lower firm-specific return variation (or higher R-square) are found to have fewer institutional investors and analysts (Piotroski and Roulstone 2005), higher amount of margin-buyings and short-sellings (Bris et al. 2007) and higher stock return sensitivity to future earnings changes (Durnev et al. 2003). In other studies, firm-specific return variation is shown to be associated with capital allocation efficiency (Wurgler 2000), capital market openness (Li et al. 2004), cross-listings (Ferreira and Fernandes 2005) and anti-takeover provisions (Ferreira and Laux 2007). The rich literature suggests that firm-specific return variation captures opacity in stock prices not limited to opaque financial reports. When firm-specific information is severely lacking, other information channels such as insider trades become more valuable and informative.

Using a sample of SEC insider trade filings, we find all three opacity measures in this paper, accruals management, real earnings management and firm-specific return variation, are significantly associated with the return predictive power of insider trades. Insider trades are more informative in firms with higher earnings management and lower firm-specific return variation. Our findings are not driven by firm size, trade volume or firm liquidity. Consistent with Seyhun (1986), we also find that trades from directors or other corporate insiders are more informative than trades from beneficial owners. Our findings support the view that insider trades impound information into stock prices when information asymmetry is great, and suggests insider trades

serve as an alternative information channel when financial reports or existing stock prices fail to fully reflect firm-specific information.

The two sources of opacity in our study- earnings management and firm specific return variation - are not completely independent. Cross-sectionally, firms with opaque financial statements are also more likely to have low firm-specific return variation and opaque stock prices (Hutton et al. 2009). Yet, while earnings management only reflects opacity in financial reports, firm-specific return variation is a more general measure of firm opacity as it captures all opacity sources reflected in stock prices, such as information obtained from analysts and voluntary disclosures. It is thus interesting to test the importance of financial reports, given the amount of information available from other information sources that are reflected in stock prices. We find that when firm-specific return variation is high (when the prices already capture most firm-specific information), earnings management matters less; in other words, opacity in financial reports matters less when other information channels reduce firm level opacity.

The contribution of this paper is twofold. First, it links together earnings management, firm-specific return variation and insider trading. Our findings supports the information role of insider trades: when financial statements and stock prices fail to fully impound information due to earnings management or low firm-specific information, insider trades bring in new information and prevent the market from being overly inefficient. Our opacity measures exhibit stronger association with insider trading informativeness compared to other information asymmetry measures in Frankel and Li (2004) and Huddart and Ke (2007), suggesting that our measures may better reflect the degree of information asymmetry. Second, the paper finds new determinants of insider trading informativeness and may be of practical interest to investors. Though Aboody et al. (2005) partially document the relation between insider trading and

accruals management, to the best of our knowledge this is the first paper documenting real earnings management and firm-specific return variation as determinants of insider trading informativeness.

The rest of the paper is organized as follows. Section 3.2 describes how we measure insider trading informativeness and opacity. Section 3.3 reports the sample construction and summary statistics. Section 3.4 reports our results. Section 3.5 presents robustness tests. Section 3.6 concludes.

3.2 Variable Constructions

3.2.1 Insider trading informativeness

Insider trading has long been viewed as a special kind of informed trading. Although SEC forbids corporate insiders to trade on "non-public, material information", researchers still find insider trades informative. Seyhun (1986) finds that insiders can predict future returns and profit from trading. The finding is later corroborated by Lakonishok and Lee (2001). In this paper, we measure the informativeness of insider trades by their return predicting power, e.g., post-trade cumulated abnormal return (CAR). Specifically, we use the market model to estimate stock betas in a -300 to -46 trading day window before insider trades, and use the estimated betas to calculate daily abnormal returns afterwards. We then sum up daily abnormal returns to obtain CAR and use it as the measure of insider trading informativeness. The intuition behind is straight-forward: the information content in insider trades is best measured by the degree of stock price reactions to the trades. The CAR measure is widely used to measure informativeness (or equivalently, the degree of information asymmetry) in many other papers including Lakonishok and Lee (2001), Hsieh et al. (2005), Frankel and Li (2004), and Huddart and Ke (2007).

One potential problem in using cumulative abnormal returns is how long the event window should be. Many of the previous studies use a 6-month window due to the short swing rule which limits the profitability of insider purchases for the following 6 months[33] (Huddart and Ke 2007). However, long windows contain much more noise because some insider trades precede major corporate events, such as earnings announcements (Seyhun 1992; Huddart et al. 2007), dividend announcements (John and Lang 1991), bankruptcy (Seyhun and Bradley 1997), and to some extent, mergers and takeovers (Agrawal and Jaffe 1995; Arshadi and Eyssell 1991; Harlow and Howe 1993; Agrawal and Nesser 2011). To avoid contaminating events, we focus on a shorter event window of [0, 5] and report results for other windows for robustness reasons.

We use the reported transaction dates, rather than filing dates, as the base dates of our event study. Insiders do not have to report their trades immediately after their trades; instead, their filing dates are often a few days later than transaction dates[34]. Seyhun (1986) argues that the dates on which insiders file their trades to SEC should be used as base days because those are the dates when insider trades become public information. However, empirical evidence suggests that significant price movements are observed on insider trading days instead of filing days (Meulbroek 1992). Though it is not clear how the market learns these trades before the filings, it seems that information in insider trades is revealed by order flows and dissipates very quickly. As a result, we think it is more appropriate to use transaction dates as day 0 in our event study.

3.2.2 Opacity measures

[33] The short swing rule mandates that when an director, officer or shareholder holding more than 10% of outstanding shares of a public company makes a profit with respect to the company's stock during the 6-month period following the trades, the insider has to pay the price difference back to the company.
[34] Currently insiders are required to file their trades within two days, but in the 1990s the filing procedure can take considerably longer.

We use three measures of opacity: accrual earnings management, real earnings management and firm specific return variation.

3.2.2.1 Accrual earnings management

To measure accrual earnings management, we construct discretionary accruals –the amount of accruals that cannot be explained by an accrual expectation model. Following the earnings management literature, we use the modified Jones model (Dechow, Sloan and Sweeny 1995) to estimate discretionary accruals. The modified Jones model is estimated for each two-digit SIC year grouping as follows:

$$\frac{\mathrm{TA_{it}}}{\mathrm{Assets_{i,t-1}}}=\mathrm{k_{1t}}\frac{1}{\mathrm{Assets_{i,t-1}}}+\mathrm{k_2}\frac{\Delta\mathrm{REV_{it}}}{\mathrm{Assets_{i,t-1}}}+\mathrm{k_3}\frac{\mathrm{PPE_{it}}}{\mathrm{Assets_{i,t-1}}}+\varepsilon_{\mathrm{it}} \quad (1)$$

Where, for fiscal year t and firm i, TA represents total accruals calculated as the difference between earnings before extraordinary items and operating cash flows, and is scaled by last fiscal year ends' total assets. $\Delta\mathrm{REV_{it}}$ captures the change in firms' sales from year t-1 to year t. PPE represents the gross value of property, plant and equipment. To enhance the validity of our estimates, we drop SIC years with less than 10 observations.

The coefficients from equation (1) are applied to the following equation to obtain estimates of firm-year specific normal accruals ($\mathrm{NA_{it}}$):

$$\mathrm{NA_{it}}=\hat{\mathrm{k}}_{\mathrm{it}}\frac{1}{\mathrm{Assets_{i,t-1}}}+\hat{\mathrm{k}}_2\frac{\Delta\mathrm{REV_{it}}-\Delta\mathrm{AR_{it}}}{\mathrm{Assets_{i,t-1}}}+\hat{\mathrm{k}}_3\frac{\mathrm{PPE_{it}}}{\mathrm{Assets_{i,t-1}}} \quad (2)$$

$\Delta\mathrm{AR_{it}}$ is change in accounts receivable from the previous year.

Finally, Discretional accruals ($dacc_{\mathrm{it}}$) is calculated as the difference between total accrual and fitted value from equation (2), which is $(\mathrm{TA_{it}}/\mathrm{Assets_{it-1}})$-$\mathrm{NA_{it}}$.

We measure DACC in year t as below:

$$\mathrm{DACC_t}=|dacc_{t-1}|+|dacc_{t-2}|+|dacc_{t-3}|$$

This is done for several reasons. First, we use lagged DACC instead of current year DACC because contemporary accounting information may not be available to general investors before financial statements are made public. Second, we add three year lagged DACC to average out yearly noises and make the opacity measure less volatile. Intuitively, firms with consistently high degrees of earnings management have opaque earnings that do not reflect true profitability. In contrast, one year lagged DACC is subject to short-term shocks and is likely to be noisier[35]. Third, we add up unsigned discretionary accruals instead of signed discretionary accruals because we are interested in opacity alone, regardless of the direction of dacc. When signed dacc is used, cancellations of positive and negative discretionary accruals fail to truly reflect accounting opacity. For example, firms may take a "big bath" in year t-3 and accrual upward in year t-2 and t-1, so adding up signed discretionary accruals makes the measure biased. Signed dacc in the three years may sum up to zero, but accounting opacity still exists. Our measure has also been used by Hutton et al. (2009).

Because we use unsigned discretionary accruals, our DACC measure becomes left-bounded and highly skewed. Therefore, we log transform it in our main results. We use untransformed variable in our robustness checks.

3.2.2.2 Real earnings management

[35] We use one year lagged DACC in our robustness check session.

To measure the degree of real earnings management, we first estimate discretionary spending following Roychowdhury (2006) procedure:

$$\frac{\mathrm{SG\&}A_{\mathrm{i,t}}}{\mathrm{Asset_{i,t-1}}} = \propto_0 + \propto_1 \left(\frac{1}{\mathrm{Asset_{i,t-1}}}\right) + \beta \left(\frac{\mathrm{Sales_{i,t-1}}}{\mathrm{Asset_{i,t-1}}}\right) + \epsilon_{\mathrm{i,t}} \qquad (3)$$

Where $\mathrm{SG\&}A_{\mathrm{i,t}}$is selling, general and administrative expense. $\mathrm{Asset_{i,t-1}}$is lagged total asset and $\mathrm{Sales_{i,t-1}}$ is lagged net sales. We estimate the model by each two digit sic year with no less than 10 observations. Following Banker et al. (2011), we drop observations with negative SG&A expenses. We focus on SG&A only because it is the most common among firms. Other real earnings management tools, such as R&D manipulation and overproduction to lower per unit cost of sales, are less general and only apply to certain industries.

The error term $\epsilon_{\mathrm{i,t}}$ in (3) is our measure of discretionary spending, which we denote $\mathrm{Disexpense_{i,t}}$.

Again, since real earnings management can be of both directions, we sum up the absolute value of $\mathrm{Disexpense_{i,t}}$ in the three year prior to insider purchases. We again log transform the absolute value to correct for skewness. Thus, our final measure for real earnings management is:

$$\mathrm{RM_t} = \log\left(|\mathrm{Disexpense_{t-1}}| + |\mathrm{Disexpense_{t-2}}| + |\mathrm{Disexpense_{t-3}}|\right)$$

3.2.2.3 Firm-specific return variation

We use firm-specific return variation as a measure of prevailing stock price opacity. As in Morck et al. (2000), we first estimate R^2 of the following regression for each firm-year:

$$R_{i,t} = \alpha_i + \beta_i * R_{M,t} + \varepsilon_{i,t} \ (4)$$

$R_{i,t}$ is the daily return of stock i on day t, and $R_{M,t}$ is the daily market equal-weighted return on day t.

To alleviate noises in the estimation, we calculate the moving average of R^2in the past three years as in accruals and real earnings management calculations:

$$R\_3yr_{i,j}^2 = R_{i,j-1}^2 + R_{i,j-2}^2 + R_{i,j-3}^2$$

Since the R-square from this regression is bounded between 0 and 1, we transform the 3 year R-square in the following form:

$$\Psi_{i,j} = \log\left(\frac{1 - R\_3yr_{i,j}^2}{R\_3yr_{i,j}^2}\right)$$

$\Psi_{i,j}$ is our final firm specific return variation measure. This measure is higher when the firm has more return variation that is not explained by the market return. Therefore, a higher firm specific return variation means better firm information environment, and a lower firm specific return variation means higher price opacity. Our measure is defined in the same way as in Fernandes and Ferreira (2009).

In our main results, firm specific return variation is estimated using equal-weighted market return. In unreported results, we tried value-weighted market return instead, and the results are not affected.

3.3 Data

3.3.1 Sample selection

We obtain insider trading data from Thomson Financial Insider Filing Data Files. Thompson provides insider trading details including insider position (e.g., CEO, board directors, etc.), transaction volumes and dates. We include only open market insider purchases from 1987 to 2010[36]. Non-open market transactions, such as stock grants, option-related transactions and bona-fide gifts, are excluded because these trades do not necessarily reflect insider opinion and are not informative[37]. We do not keep insider sales for several reasons: first, unlike insider purchases, open market insider sales are not always driven by insider information. Corporate insiders risk by working and investing in the same firm; therefore, insiders are expected to sell shares from time to time due to diversification considerations. Second, some insider sales recorded in the database are not active sales; occasionally insiders are forced to liquidate their shares due to margin calls when stock prices drop sharply. In results not reported in this paper, we find our empirical evidence are much weaker for insider sales than for insider purchases, consistent with Aboody et al. (2005).

If an insider has multiple transactions in a day, we combine the transactions into a single one. This is because a single order may be broken down into smaller orders and executed at different prices, and some insiders report each transaction separately. We also drop the firms that are not covered in CRSP or Compustat, and firms in financial or utility industries. Our final sample consists of 268,949 insider trades.

One often-ignored problem in insider trading research is that a similar-sized outsider trade may as well cause market reactions like an insider trades does. To address the problem, we sort insider trades into groups based on subclasses of insider positions. Intuitively, a trade from key corporate insiders like board directors may convey more information than a trade from a

[36] 1987 is the first year we have available data to calculate accounting opacity.
[37] Other studies, for example, Seyhun (1986) and Huddart & Ke (2007), also exclude non-open market transactions.

non-director beneficial owner does. The heterogeneity in insider groups is also documented in Seyhun (1986), which finds trades from directors are more informative than trades from officers or beneficial owners. By comparing the informativeness in trades from different insiders, we can be sure our results are not driven by mere trade size effects. Following Agrawal and Nasser (2011), we categorize insiders into five groups: board, officers, top managers, top financial officers, and beneficial owners. Board includes all board directors. Officers include all corporate officers defined by the section 16(a) of the Security Exchange Acts of 1934. Top manager includes Chairman, President, Chief Executive Officer (CEO), Chairman and Chief Operation Officer (COO). Top financial officers include Chief Financial Officer (CFO), controller and treasurer. Beneficial owners are blockholders holding no less than 10% of the equity securities in the firm. Slightly different from Seyhun (1986), we don't find much difference between trades from directors and from officers; instead, our results suggest that beneficial owners trade in very different patterns compared to other insider groups[38], and their trades seem to be less informative. Therefore, we also show results for all non-beneficial-owner insiders as a separate group. We find trades from beneficial owners are less informative despite of their larger sizes. The findings suggest our results are not driven by trading sizes but informational content in each trade.

3.3.2 Descriptive statistics

Table 3.1 shows our descriptive statistics in general. According to Panel A, our sample constitutes 8,901 unique firms and 43,012 firm-year observations. On average, insiders have 6.25 purchases per year and each purchase has a median of 3,000 shares.

[38] In unreported summary statistics, we find non-beneficial-owner groups report much more sales than purchases, and purchase size is greater than sale size. However, for beneficial owners, buy and sell frequencies and volumes are roughly the same.

Panel B shows descriptive statistics by year. In an average year, over 1,000 firms conduct insider buys and the average trades per firm/year ranged between 4.16 and 10.87. Within insider categories, board has the largest percentage of insider transactions and top financial officer has the smallest. However, the percentage of board transactions decreases while the percentage of beneficial owners increases over time. Note that the percentages may sum up to more than 100% since an insider can hold multiple roles.

[Insert Table 3.1]

Panel C shows correlation matrix. First, accrual management (log DACC) and real management (log RM) have a positive correlation of 0.305. This positive correlation suggests that accrual and real earnings management are often used together in a firm, consistent with Cohen et al. (2008) and Zang (2012).

The positive correlation between firm specific return variation and the other two opacity measures (DACC and RM) raises concerns. Since high firm specific return variation measures high transparency, this positive relationship indicates that high transparency are linked to high information opacity from accounting statements, contradictory to what has been documented by Hutton et al. (2009).

This counter intuitive relationship can be explained by the highly positive correlation between firm specific return variation and firm size. High firm specific return variation firms tend to be smaller. Since high DACC and RM firms are often smaller, the positive relationship between accounting opacity and firm specific return variation merely captures their correlations with firm size. In fact, once we control for size, the relationship between accounting opacity and firm specific return variation becomes negative.

3.4 Insider Trading and Opacity

3.4.1 Trading period return and opacity

To understand the relationship between opacity and stock market reactions to insider buys, we plot mean cumulative abnormal returns from one month (approximately 20 trading days) prior to insider buys to six months (approximately 120 trading days) after insider buys. Specifically, we divide firms into high/median/low groups[39]according to their opacity measures: high DACC, high RM and low firm specific return variation indicate high firm level opacity.

[Insert Figure 3.1]

Figure 3.1 presents some remarkable patterns. First, abnormal returns are persistently negative in the one month prior to insider buys, until one day prior to insider buy. On average, the cumulative abnormal return in the one month prior to insider buys is below -2%. When insider makes a purchase, we observe a sharp and steady increase in abnormal returns. Cumulative abnormal return is on average 0.5% on day 0, over 2% in one week, and steadily increases to 9% in 120 days. Table 3.2 verifies the statistical significance of this increase. We show that the increase in abnormal return is statistically significant regardless of the role of insiders. However, both the economic and statistical significance of CAR is much lower for beneficial owners, comparing to those "real" insiders (e.g, 2% vs 9% in 120 day window). This is consistent with the idea that trades by beneficial owners who may not be directly involved in corporate decision making contain less information than trades by real decision makers.

[Insert Table 3.2]

Second, the increase in abnormal returns is more significant for high opacity firms than for low opacity firms. In our figures, the impact of insider buys is consistently higher in firms

[39] Quartiles and quintiles give us similar results but in tertiles the groups exhibit the clearest order.

with greater earnings management. This suggests that insider purchase informativeness is higher in more opaque firms. Univariate results in Table 3.3 confirm this pattern. In Table 3.3, we report abnormal returns in high/median/low opacity groups. We pick CAR[0,5] window as our reporting window for univariate statistics. Prior to SOX, the required reporting period after insider trades is within 10 days of the close of calendar month of such transaction. As a requirement of SOX, in July 2002, the required reporting period is shortened to within two business days of transaction. Since our sample covers both the before and after SOX period, we pick an intermediate period CAR [0, 5] as our reporting window. In multivariate regressions, we will include all alternative event windows, from CAR [0, 1] to CAR[0,120] as robustness checks.

In Table 3.3 Panel A and B, we show that stock market reactions are stronger for high accounting opacity groups. Cumulative abnormal returns increase monotonically in both DACC and RM, and the results hold among all insider groups. When we take the difference of stock market reactions for the highest accounting opacity group and the lowest accounting opacity group, the difference in CAR is between 0.5% and 1% on average. However, this distinction primarily exists in non-beneficial owners. When beneficial owners make a purchase, firm level accounting environment does not seem to make a difference in stock market reactions.

[Insert Table 3.3]

The relationship between firm specific return variation and stock market reactions to insider purchases is less clear. Figure 3.1 shows that less transparent firms (low firm specific return variation) have higher long run cumulative abnormal returns (especially after 40 trading days). However, this pattern is not apparent in the short run window. Table 3.3 Panel C shows that the overall CAR[0, 5] is 0.083% higher for more transparent firms than for less transparent firms, in contrast to the long run results. We suspect this unstable univariate relationship between

transparency and insider trade is resulted from the high negative correlation between firm-specific return variation and firm size (correlation=-0.575). Smaller firms are often linked with higher information asymmetries and lower insider trade informativeness (for example, Lakonishok and Lee 2001). Without controlling for the impact of firm size, the univariate results may be very biased due to omitted size effects. To address this problem, we first sort firms into size tertiles (small/median/big firms). Within each size group, we then divide firms into low/median/high groups by firm specific return variation[40]. When we calculate CAR after insider purchases in each size-transparency group, we show in Panel C that in a five day window, CAR is about 0.6% lower for high transparency firms than for firms with low firm-specific return variation[41]. After separating the size effect from firm specific return variation, our results again demonstrate that opaque firms are linked with better insider trade informativeness.

3.4.2 Multivariate results

In this section, we turn to multivariate regressions to examine the relationship between firm opacity and insider trade informativeness. Specifically, we perform OLS with year fixed effect and cluster at firm level. Our regression follows the format below:

$$CAR[0,5]_i = \alpha_1 + \beta_1 \times Total\ Assets_{i,t-1}(log) + \beta_2 \times Book\ to\ Market_{i,t-1} + \beta_3 \times Opacity_i + Year\ Dummy + \varepsilon_i$$

Our variable of interest is opacity, measured by DACC, RM and firm specific return variation. We use firms' logged total assets at year t-1 to control for the effect of size and we also

[40] In univariate analysis, the strong negative correlation between size and earnings management may give an over-estimation of the impacts of earnings management measures, and an under-estimation of the impact of firm-specific return variation measure. In undocumented results, we show that our results hold with DACC/RM, within size tertiles. We did not include this set of results here since they are qualitatively similar.

[41] We only report the results for all insiders. The results for individual insider groups are qualitatively similar.

control for firms' book to market at year t-1. Size and book-to-market ratio are commonly known to affect returns (Fama and French 1992); besides, size and book to market ratio are likely to affect a broad range of firm characteristics including opacity measures. Since small firms and value firms tend to have higher returns (Lakonishok and Lee 2001), we expect a negative sign for size and positive sign for book to market. All variables are winsorized at 1% level.

Table 3.4, 3.5 and 3.6 reports the regression results correspond to DACC, RM and firm specific return variation. In each table, Panel A reports the full regression results by insider group. Panel B presents the coefficient of opacity measures (β_3) for alternative time windows, from CAR[0,1] to CAR[0,120], again by insider group.

[Insert Table 3.4]

[Insert Table 3.5]

[Insert Table 3.6]

Multivariate regression results confirm that firm opacity is associated with higher insider trade informativeness. Table 3.4 and Table 3.5 show that both DACC and RM are significantly positive for all non-beneficial-owner insiders, namely directors, officers, top managers and top financial managers in all time windows. Indeed, for non-beneficial owners, a one standard deviation increase in DACC/RM is associated with 0.33%/0.2% higher cumulative abnormal returns within a week, and around 2.6%/2.4% higher cumulative abnormal returns in six month period. This magnitude is economically significant, given that the average 6 months CAR is around 11% for non-beneficial owners. In Table 3.6, we turn to the role of firm specific return variation on insider trade informativeness. Again with non-beneficial owners, all regressions indicate that high transparency firms are associated with low stock market reactions. On average,

one standard deviation drop in transparency is associated with an increase of about 0.3% CAR in five days and of about 6.7% CAR in six months. Both CARs are higher comparing to the numbers associated with accounting opacities measures.

In contrast, firm opacity matters much less for the trade informativeness of beneficial owners. Further, the magnitudes of the coefficients are almost always smaller than coefficients for non-beneficial owners. This suggests that trades from "true" insiders are much more informative than trades from beneficial owners, who are less involved in firm decisions.

In general, our multivariate regression results affirm that accrual earnings management, real earnings management and firm specific variation all contribute to insider trade informativeness.

3.4.3 Accounting opacity, firm specific return variation and insider trading informativeness

Hutton et al. (2009) find firms with opaque financial reports also tend to have lower firm-specific return variation (higher R-square). Their results are intuitive because stock prices are supposed to be "information aggregators" (Diamond and Verrecchia, 1981) and reflect most of publicly available information including information from financial reports. As a result, when financial reports are opaque, the opacity will eventually be reflected in uninformative stock prices, e.g., prices with low firm-specific information.

A natural inference is that when stock prices capture much firm-specific information, opaque financial reports do not matter that much because other information channels will eventually reduce the opacity and make stock prices informative. Therefore, earnings management measures may only impede information channelling when firm-specific return

variation is low. When it comes to insider trading informativeness, earnings management may only be associated with insider trading informativeness when firm-specific return variation is low.

[Insert Table 3.7]

To test the hypothesis, we add interaction terms of DACC/RM and firm specific return variation. For ease of interpretation, we generate a dummy variable that equals to 1 if firm specific return variation is above median and 0 otherwise. In undocumented results, we also use firm specific return variation as a continuous variable to conduct the interaction, and our results are qualitatively similar. We again report our main regression results in Table 3.7 Panel A and C. Panel B and D report coefficients of interaction terms in alternative event windows.

We find that RM and DACC significantly associate with insider trade informativeness when the firm specific return variation is low (dummy=0). However, when the firm specific return variation is high (dummy=1), the impact of DACC/RM is largely reduced. In fact, the negative coefficient on the interaction term is often equal to or bigger than the coefficient on DACC/RM, which suggests that DACC/RM may not affect insider trade CAR at all when firm specific return variation is high. One other interesting observation is that RM and DACC becomes significant in beneficial owner regressions. This suggests that when the stock price does not incorporate much information, even trades by beneficial owners may reveal positive signals to the market.

Our findings suggest that when the general opacity is high, each single information source (specifically in this paper, financial report) becomes more valuable, and opaque information from the source results in higher informational costs. In this scenario, insider trades become more valuable and informative.

3.5 Robustness Checks

3.5.1 Firm-year level regressions

One potential concern is that we give more weights to firms with more insider purchases when we use trade level data. To test if our results are sensitive to weighting, we weight each firm equally by running regressions at firm/year level. In this set of regressions, we calculate the annual average cumulative abnormal returns as dependent variable. Again, our variable of interest are DACC, RM and firm specific return variation, and we control for year fixed effect, book to market and total assets in all regressions[42].

Table 3.8 shows that the results for annualized regressions are consistent with our prior analysis. The coefficients for DACC (log) and RM (log) are significantly positive, and the coefficients for firm specific return variation are statistically negative at conventional levels across all windows.

[Insert Table 3.8]

3.5.2 Alternative specifications for main variables

Table 3.9 shows regression result using alternative specification for main variables. In Panel A, we use one year opacity measure (logged) instead of three year measures. One year opacity measure is noisier than three year measures in reflecting the firm's overall firm opacity, so we expect our results to be weaker. As we predicted, the results are weaker but still consistent with our argument. In Panel B, we use three year level of opacity instead of three year logged

[42] In robustness checks, we only report results for ALL INSIDERs.

measure. When we use the level of R^2 without log transformations, higher R^2 indicates lower firm level transparencies and thus, the expected regression coefficients for R^2 should be positive. Overall, the results when we use alternative specifications for main variables, our results are generally similar.

[Insert Table 3.9]

3.5.3 Additional control variables

Stock reaction to insider trades could be confounded by trade size and illiquidity effect. Big insider purchases may push price up through temporary price pressures, especially for short-term windows (Brochet 2010). Thus, we control for trade size effect by including scaled insider trading volume: insider trading volume/common shares outstanding. We also control for Illiquidity since illiquidity has also been documented as an important pricing factor (Amihud 2002). Illiquidity is calculated as average daily absolute return over daily dollar volume in millions during the current year, as in Amihud (2002).

[Insert Table 3.10]

Table 3.10 shows that our results are robust after controlling for trade size and illiquidity. The coefficients for trade size are positive and significant; suggesting that trade size does positively impact stock market reactions. Illiquidity measures, however, only seem to affect insider trade informativeness in the long run. Overall, the relationship between opacity and insider trade informativeness still holds after controlling for trade size and illiquidity.

3.6 Conclusion

Insider trading is strictly regulated in most economies today (see Bhattacharya and Daouk, 2002). Meanwhile, economic and law researchers are still debating whether insider trades should be de-regulated as they are likely to contribute to market efficiency. Our paper adds empirical evidence to the informational contributions of insider trades; we show that when financial reports are obscured by earnings management or when stock prices contain little firm-specific return variation, insider trades take effects and become more informative. Insider trades function like an alternative information channel as they impound insider information into stock prices.

The paper also suggests that a good way to limit insider trading profit is to make financial reports and stock prices more informative. Insider trading profits are disliked by the general public, and in history many stories of huge insider trading profits raised great public outcries; but if financial reports fully reflect firm fundamentals and if stock prices capture all firm-specific information, there will be little room for insiders to beat the market and profit. This arouses another question: is firm opacity endogenous? Do corporate insiders have incentives to make financial reports or stock prices more opaque so that their trades can better predict future returns? More studies need to be done before a final conclusion can be reached.

Our paper also shows that opacity in financial reports matters less when the general information environment is good. When other information sources impound firm-specific information into prices, the relation between financial reports opacity and return predictive power of insider trades become significantly weaker. This seems to indicate that earnings management only works in firms with low firm-specific return variation. In firms with better information environment (higher firm-specific return variation), even opaque financial reports are properly priced so that insiders cannot profit from trading. Unfortunately, not all firms have

good information environment. As a result, earnings management may still matter for most of public firms.

Chapter 4 . When is Human Capital a Valuable Resource? The Performance Effects of Ivy League Selection among Celebrated CEOs[43]

4.1 Introduction

We examine the conditions under which human capital constitutes a resource. Human capital is said to encompass the knowledge, skills and talents inherent in individuals, yet its status as a source of economic rent remains unclear (Coff, 1999). Recent analyses show its impact on firm rents to be mixed (Crook et al., 2011; Dimov & Shepherd, 2005; Goettesman & Morey, 2006; Martelli & Abels, 2010). Findings to date suggest that human capital is most valuable to a firm when it is a non-tradable asset in labor markets such that its rent cannot be appropriated (Ahuja et al., 2005; Coff, 1999; Lazear, 2009; Wang, He & Mahoney, 2009) and when it is less subject to adverse selection (Ackerloff & Yellen, 1986; Malmendier & Tate, 2009). It also is shown to contribute more to operational outcomes such as efficiency, product quality (Hatch & Dyer, 2004) and personal evaluations than to firm returns, which are less consistently affected (Crook et al., 2011).

Unfortunately, much of the literature operationalizes human capital as normal education or experience, which given their prevalence and potential imitability may not be adequate resource proxies (Barney, 1991). Another drawback is that many previous studies concentrate on the knowledge capital of middle level employees whose output may relate only tangentially to firm-level economic rents (see the review by Crook et al., 2011).

[43] A version of this chapter has been published. Copyright © 2014 John Wiley & Sons, Ltd. Used with permission from Danny Miller and Vikas Mehrotra (2014). When is human capital a valuable resource? The performance effects of Ivy League selection among celebrated CEOs? Strategic Management Journal, forthcoming.

Our research attempts to address these gaps by studying a type of human capital that is relatively rare and highly selected and thus might well qualify as a resource: namely graduates of Ivy League schools with stringent admissions policies. Moreover, we examine a group of chief executives who have risen to the top of their profession such that sustained outperformance in that rarified group would truly attest to a high level of capability. We also demonstrate the contingent nature of this human capital resource, highlighting just when and where it has the greatest value (Miller & Shamsie, 1996). CEO services are in some respects a tradable asset (Ackerloff & Yellen, 1986; Coff, 1999). However information asymmetries regarding a CEO's true potential may impede that person's ability to capture all of her incremental rent (Greenwald, 1986; Lazear 2009; Lippman & Rumelt, 2003). We shall argue that that is especially true in early career and in smaller firms where a CEO is less visible to rival bidders. Appropriation may also be difficult where executive talent resides in subtle social and cognitive skills linked to a selective undergraduate program, or is firm specific (Hatch & Dyer, 2004; Holcomb et al., 2009; Lippman & Rumelt, 2003).

We study a specially selected sample of celebrated CEOs – those who had significant power in directing their organizations and setting strategy, and whose putative status as human capital had been signaled independently, in our case by cover stories in the top three US business journals: *Fortune, Business Week* and *Forbes* from 1970 until 2008. To determine the potential resource status of human capital trained at a selective, quality institution, we compared the performance of the firms of CEOs who attended the eight Ivy League schools to that of the firms of other accomplished CEOs on the covers of the same magazines. Because RBV resource criteria set a high bar for rarity, inimitability, and non-substitutability (Barney, 1991), and for the resulting "abnormal rents", our sample of celebrated managers was a useful one for establishing the resource value of human capital. Moreover, the cover stories, rightly or not, ascribe the good

performance to the CEOs, suggesting that they had considerable decision making power and acted in visible ways to shape their companies. Finally, as we focus on market returns, our findings are net of any appropriation of rents (Coff & Kryscynski, 2011).

4.2 Hypothesis

4.2.1 Ivy League selection as a marker of scarce human capital

Human capital theory asserts that individual skills represent an important source of economic productivity, and that those skills can be enhanced by training and education (Becker, 1964; Zhang, 2012). It remains a question however whether an individual's selection by a stellar educational institution can constitute or signal a resource – in other words, can a firm extract economic rents from pivotal human resources that have been especially well-selected or trained (Coff, 1999)?

Ivy League schools represent the top echelon of U.S. universities, most of which have enjoyed outstanding reputations for more than a century. These schools include Harvard, Yale, Princeton, Columbia, Brown, Dartmouth, Pennsylvania and Cornell, and are among the most selective in the world. Their acceptance rates generally range from about 5% to 15% of total applications (which themselves are likely to represent a higher than average quality pool, see http://theivycoach.com/ivy-league-statistics-by-college/), and their criteria for admission are both academic and social. Candidates have to have demonstrated outstanding scholastic ability, general intelligence as demonstrated by standardized testing such as SAT scores, and leadership in extra-curricular social activities (Hernandez, 1997; Zhang, 2012). Thus the vast majority of

Ivy students will have proven their talent even before arriving at university[44]. Ivy League schools are also known to provide an excellent education. Moreover, before the 1960s, Ivy schools displayed a bias in favor of admitting those from wealthy establishment families with important social connections (Coleman, 1988; Kingston, 1990; Palmer & Barber, 2001). It stands to reason therefore that admission to an Ivy League school may signal a human resource that is particularly likely to promote superior sustained performance, as those selected are, in effect, winners of a tournament of talent (Lazear & Rosen, 1981). We expect that firm performance effects signaled by Ivy League selection will be most marked for CEOs. CEOs usually have the greatest impact on a firm's strategic direction and their actions may profoundly shape firm performance (Finkelstein, Hambrick & Cannella, 2008; Henderson et al., 2006). This might be especially the case among firms whose executives have been celebrated as being successful leaders.

Selection by a top university may indicate a variety of talents. Rogers (2010) has found that education was associated with more creativity and innovation, and greater receptiveness to new ideas. Higher levels of CEO education have been linked to superior levels of cognitive complexity (Wally & Baum, 1994), more innovation (Wiersema & Bantel, 1982), more sustained investment in a firm (Bertrand & Schoar, 2003), and a facility to make valuable alliances (Palmer & Barber, 2001). All of these outcomes may lead to sustainable superior firm performance.

Finally, as we shall argue below, many Ivy-selected CEOs are unlikely to be able to appropriate all of their incremental rents because under specific conditions, information

[44] Dale & Krueger (2002) found that those admitted to Ivy schools who decided to go to colleges with lower SAT hurdles earned as much as did the Ivy graduates.

asymmetries conceal their value to potential bidders and asset specificity reduces their transferability (Hatch & Dyer, 2004; Holcomb et al., 2009; Lippman & Rumelt, 2003).

H1: Firms run by CEOs selected by Ivy League schools will show superior sustained performance, even over other high performing CEOs.

4.2.2 Undergraduate versus graduate training

We do not expect that all forms of a CEO's education will be equally valuable to a firm's performance. Education varies in the types of students it selects for, and hence their suitability to the task of outstanding general management. Undergraduate programs at Ivy schools select for general intelligence and past achievements, academic and non-academic alike (Hernandez, 1997). These programs also seek out those with analytical ability and social skills (Zhang, 2012). It is such subtle skills and talents – and the relationships developed among those who posses them – that are most relevant to the demands of a CEO position, and perhaps less visible to bidders outside the firm (Lazear, 2001; Lazear & Shaw, 2007). They foster creativity, problem-solving ability, communication skills, and the capacity to form useful social connections. When competing against other very high achieving CEOs, those skills may be especially valuable.

By contrast, graduate programs base selection for admission more on general cognitive intelligence (essentially IQ) and competency within a specialized field of knowledge. They also constitute more subject- or discipline-focused training remote from the job of CEO (Hernandez, 1997). Selection for these talents is more apt to be useful within a specialized field than in dealing with the notoriously varied, ill-structured and socially complex challenges confronting an executive. Moreover, high IQ and an advanced knowledge of physics, law, or finance will get a CEO only so far, especially if the object is to outperform creative, motivated, well-connected and

socially accomplished competitors[45]. In short, CEOs selected for Ivy undergraduate degrees will be more likely to outperform other high achieving CEOs than those who have an Ivy graduate degree[46].

H2: The performance advantage of Ivy League human capital selection will accrue mostly to CEOs with Ivy undergraduate as opposed to graduate degrees.

4.2.3 Selection and educational versus experience effects

If an executive's performance were truly due to education and selection for talent, we would expect that to be reflected relatively early in a career, before other factors come into play. Less seasoned CEOs may have to rely more on their natural talent and education as they often lack the reputation, connections and political clout accruing to older executives (Hambrick & Fukutomi, 1991)[47]. CEOs also are more likely to change their strategies and make their mark in the first half than in the last half of their tenures – thereby having more influence on the performance of their companies (Henderson, Miller & Hambrick, 2006; Wiersema & Bantel, 1982). Finally, potential bidders for talent are less apt to recognize the value of a young CEO, thereby reducing chances of rent appropriation. By contrast, after many years on the job, it is very likely that experience as a manager and the connections one builds in the normal course of a career may come to matter more than one's formal education and early talent, however exalted, especially when competing against an outstanding cohort with years of enriching experience.

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[45] Specialists such as investment bankers, lawyers, or doctors often appropriate their rents.
[46] We do not wish to impugn the merits of Ivy graduate education, merely to suggest that they represent a type of training perhaps more suitable to particular specialties than general management at the highest level of achievement.
[47] By contrast, older CEOs may be so late in their job histories and having been subject to a wide variety of career and personal influences that they no longer exploit the training and contacts they received at school. Older CEOs also tend to be less likely to use their discretion to shape the strategies of their organizations (Miller & Shamsie, 2001).

H3: The firm performance advantages of Ivy League human capital selection will be strongest earlier in CEO careers.

4.2.4 Firm context: small versus large firms

If the selective education of a CEO were truly to have an effect it would be most apt to reveal itself where the CEO has the most influence on firm outcomes – specifically, in smaller rather than larger companies[48]. First, CEOs have more discretion to influence a company more quickly and more profoundly in smaller firms (Finklestein et al., 2008). There are fewer administrative levels to remove them from direct command, and less bureaucracy to slow them down. Moreover, in smaller companies, a prestigious CEO might confer legitimacy upon a firm, thereby enhancing its access to resources. Smaller firms are also subject to significant competitive challenges because of their size, having to formulate creative niche strategies that benefit from the superior talent signaled or conferred by an Ivy degree (Porter, 1990). Finally, modest CEO visibility in a small firm may impede CEO rent appropriation.

By contrast, larger firms have been shown to be more bureaucratic, rule bound, and thus more sluggish to adapt (Miller & Chen, 1994). They also are apt to have amassed significant political and financial resources that give them power in the marketplace. Thus they may benefit less dramatically from the contributions of a capable CEO. CEOs of large firms may also be more visible to outside bidders for talent – and hence subject to rent appropriation.

H4: The firm performance advantages of Ivy League human capital selection will be strongest in smaller firms.

[48] If the Ivy effect were strong in large firms and weak in small ones that might suggest that richly endowed, high performing firms are more apt to acquire costly Ivy grads. Here performance might be driving Ivy selection rather than vice-versa.

4.2.5 Why does an Ivy degree matter: connections versus competency?

Some have argued that Ivy League schools do not so much signal talent or provide an excellent education as confer the social networks to sustain CEOs despite modest levels of competency (Coleman, 1988; Judge et al., 1995; Newcomer, 1955; Useem & Karabel, 1986). In other words, the superior performance associated with an Ivy degree may be more due to social contacts than competency.

It is well established that up until about 1960, Ivy League schools based admission in part on the social connections and wealth of the parents of their applicants (Farnum, 1990; Hernandez, 1997; Kingston, 1990; Palmer & Barber, 2001). That would not only give a university prestige, but might attract potential donors and prominent entrants with whom their less economically privileged cohorts might interact to enhance social mobility. Beginning in the 1960s, however, admission criteria at the Ivy schools became more reliant upon applicants' intelligence and achievement (Kingston, 1990; Zhang, 2012).

It might be argued, therefore, that if social connections mattered more to business success than talent, then graduates of the early era Ivy classes would do better than graduates from more recent years. Conversely, talent might be shown to be more important to performance if the later classes did better than the earlier ones. Thus two opposing hypotheses:

H5a: *Social Capital Hypothesis: The older / well connected Ivy cohort will outperform.*

H5b: *Human Capital Hypothesis: The more recent / talented Ivy cohort will outperform.*

4.3 Empirical Results

4.3.1 Methods

We chose to study situations in which a CEO's human capital was deemed by experts (editors of major business periodicals) to account for superior firm performance. Thus we selected a sample in which outstanding managerial impact was established by a) the highest level of executive influence – namely the CEO position, b) significant organizations that pose a substantive managerial challenge for the leader, c) publicly traded organizations subject to oversight and monitoring by investors, d) selection for a complimentary cover story by a top-three circulation US business magazine – namely, *Business Week, Fortune* or *Forbes*. This last stipulation ensured that our Ivy League CEOs would be compared to a cohort of high-achievers. We chose as standards of evaluation the market valuations of the firm, thereby avoiding the accounting manipulations to which financial returns measures are subject. Moreover, to handle endogeneity concerns we examined the relative *sustainability* (i.e. changes in) valuations *after* the CEOs had appeared on the cover.

Our period of analysis was 1970 to 2008, during which we coded every issue of the above three journals to identify every cover story about a CEO of a firm for which financial information was available in the Compustat database. We then identified covers that were positive -- those in which a CEO's achievements were praised. Neutral stories were deleted from the sample. The coding was straightforward as the positive stories celebrated the CEOs and their firms. In all, we identified 502 positive covers during the period, but dropped duplicate covers for the same CEOs in a given period, resulting in a final 444 observations.

To ascertain the accuracy of classifications, a random sample of 50 covers was chosen from our journals which included those reporting poor, ambiguous or celebrated CEO behavior

and performance, and we subjected these to an independent rating process. In only one case was there disagreement as one rater deemed a positive cover as being "somewhat neutral". Thus inter-rater agreement was very acceptable.

To confirm the superior performance of our CEOs with positive covers, we report their industry median- and year-adjusted performance relative to firms in the Compustat database in their profitability, growth, and market-to-book valuations over the comparable time period (see Table 4.1, panel A).

[Insert Table 4.1]

4.3.2 Variables

Our dependent variables were both the levels and changes in firm market valuation as assessed by Tobin's Q. Tobin's Q reflects the evaluation by the market of all of the information about a company available to investors and as such is a better measure of performance than profit-based indexes such as return on assets which are more easily subject to manipulation by managers (Shleifer & Vishny, 1997; Villalonga & Amit, 2006). Tobin's Q also reflects investors' evaluations of the prospects of the company. We examined average valuations for 3, 2 and 1 year intervals pre-and post-cover – in other words for 7, 5 and 3 year market valuation averages centered on the publication year. In order to evaluate the *sustainability* of the superior returns we also assessed changes in Tobin's Q for 3, 2 and 1 year intervals after the cover to reduce chances of endogeneity and establish robustness. The dependent variables were winsorized at the 5% level to remove outliers.

We assessed each CEO-cover firm according to the following variables. First, we examined some attributes of the CEO: specifically, a binary variable to reflect whether or not the CEO either possessed an Ivy League degree or had gained admission to an Ivy League school. For testing hypotheses 2 to 5, respectively, we measured degree level, number of employees, CEO age, and year of graduation. To control for possible gender bias we incorporated the gender of the CEO in all of our models (Martelli & Abel, 2010). Also, because founders have been shown to outperform (Miller et al., 2007; Villalonga & Amit, 2006), we controlled for a CEO's founder status. To control for training in management, we included a binary variable reflecting possession of a business degree. All CEO-related data were hand collected from Who's Who, Notable Names Database (NNDB Mapper), company websites, and other internet sources.

In all analyses, we also controlled for industry at the 2 digit SIC level using Compustat figures, as well as the year in which the cover appeared. Moreover, in predicting post-cover change in performance (Panel B of Tables 4.2 to 4.6), we incorporated the level of Tobin's Q in the year prior to the cover to take into account mean reverting tendencies (De Bondt & Thaler 1985; Fama & French 1988). The analysis of post-cover changes in performance reveals the extent to which CEOs with an Ivy degree are able to sustain their superior performance relative to other cover CEOs whose achievements had also been celebrated with positive covers.

4.3.3 Analyses

Table 4.1 compares the performance of our sample of successful cover CEO firms versus Compustat firms with assets above $25 million, adjusted for year and industry median performance. The correlation matrix is presented in Table 4.1 panel B, and the regression models with all controls are presented in Tables 4.2 to 4.6. In all instances clustering was

performed at the CEO level (Peterson, 2009). Tables 4.3 to 4.6 contain the subsample analyses; for Table 4.3 the sample was split according to whether a CEO had obtained a graduate or an undergraduate Ivy degree, for Tables 4.4 and 4.5 subsamples were defined by median bifurcation according to CEO age, and firm size, respectively; for Table 4.6 the sample was divided according to the 1960 year of graduation.

4.3.4 Findings

Table 4.1, panel A shows that our cover firms significantly outperformed the Compustat firms in asset growth and in Tobin's Q. This was indeed a high performance sample of companies, and thus any outperformance by Ivy CEOs represented an impressive achievement.

We also wished to compare the prevalence of Ivy CEOs in our 40-year cover sample to those in Fortune 500 firms, a comparable group of companies in visibility and scale. We used various published sources to obtain the Fortune 500 data, including Who's Who, Kieser (2004), and Forbes. On average, during this interval 23.4% of the CEOs of Fortune 500 firms had Ivy degrees, whereas 33.1% of our cover sample comprised Ivy CEOs – clearly a significant over-representation in a sample of very high achievers.

In Table 4.1 panel B, the mean for Q_7 is smaller than Q_5, which is smaller than Q_3 (the subscripts here refer to the number of years in the average). This indicates that peak performance is centered on the cover event, an inference also supported by the values for the changes in Q in the post-cover time period. We exploit this pattern later in this section when we study sustainability of performance following the cover event.

The focus of our research, however, was to assess how well Ivy CEOs might do in this impressive sample – is it simply that their prestigious degree gets them into good jobs and brings them favorable attention from the press, or do they actually outperform within this select cover appearance group? Tables 4.2 to 4.6 provide evidence of when and where the latter occurs.

Table 4.2 indicates that CEOs with Ivy League degrees were associated with superior firm market valuations and a greater ability to sustain those valuations than the comparison group of cover CEOs without an Ivy association. Thus Hypothesis 1 receives support for intervals surrounding the covers of 7, 5, and 3 year average Tobin's Q ratios, and also for changes in Tobin's Q 1, 2, and 3 years post-cover. However, the subsample analyses will tell a more nuanced story.

We note from Table 4.2, panel B that the changes in Q-ratios are negative and statistically significant, indicating a tendency for mean reversion (also see related means in Table 4.1, panel B). This suggests that perhaps luck played an important role in our CEO's success (Poterba & Summers, 1988). However, the positive coefficients for Ivy League education in Table 4.2 Panel B show that Ivy League CEOs are better able to avoid reversing their pre-cover event valuations, and hence are inconsistent with fortune alone driving performance. The same cannot be said of non-Ivy league CEOs.

[Insert Table 4.2]

According to Hypothesis 2, we expected that undergraduate degrees from selective Ivy schools would be more conducive to superior performance than specialized graduate training. Table 4.3 bears this out, thus confirming our second hypothesis. Indeed, the firms of CEOs with undergraduate Ivy exposure outperformed others, whereas the firms of CEOs with graduate Ivy degrees did not. We present the subsample findings as they more precisely demonstrate just how

strong the relationship between Ivy training and performance is within the different educational groups. Furthermore, in the difference regressions (panel B), only the Ivy League undergraduate-degree CEOs displayed superior performance, with the strength of the coefficients offsetting the mean-reversion indicated by the coefficient for lagged Q ratios. These findings of the subgroup analyses were fully confirmed by interaction analyses on the total sample using a product of Ivy and a dummy that distinguished education at or above or below the Master's level (analyses are available from the authors).

[Insert Table 4.3]

Hypotheses 3 and 4, respectively, suggested that Ivy selection would be more useful to performance earlier in CEOs' careers, and where firms were relatively small. From Tables 4.4 and 4.5 we see that these hypotheses were supported. Ivy positive effects were strongest for younger CEOs and those in smaller firms. These findings were also obtained for analyses of the entire sample using Ivy * size, and Ivy * CEO age interaction dummies.

Finally, Table 4.6 relating to Hypotheses 5a and b compares eras of graduation to assess talent versus social capital Ivy effects. We found that an Ivy degree granted before 1960 did not confer any performance advantage; the opposite was true for degrees granted after that date. Thus the value from an Ivy degree is derived not so much from the social capital conferred during the earlier era of social elite selection, but rather the talent associated with selection in the more recent meritocratic era. This however is only a suggestive result as our study cannot distinguish conclusively the effects of selection for talent, the knowledge imparted by education, and the social capital accruing to an Ivy cohort.

[Insert Table 4.4]

[Insert Table 4.5]

[Insert Table 4.6]

Some of our control variables showed interesting results. For example, a management degree did not raise market valuations and was associated with more rapid post-cover declines in performance. We also found that founder firms outperformed. This is not surprising as firms run by their founders are comparatively young, and for them to warrant a cover story from a prominent national business magazine suggests that these executives have brought their firms to national attention in an unusually short span of time. Founder firms are also held to be relatively free of agency problems (Miller et al., 2007). Surprisingly, the dummy variable for female showed a negative coefficient. It may be that the relative paucity of female CEOs garners them preferential treatment in the cover decision by magazine publishers. A detailed examination of such gender biases is left for future studies.

4.3.5 Robustness

We employed several techniques to establish the robustness of our findings. First, we examined both the level and the changes in market valuation (Tobin's Q) as these might be influenced by a CEO's having an Ivy degree. We also examined three different averages for the level of Q and three different intervals for the changes in Q. There was considerable convergence in these findings. Moreover, we tried dropping management degrees from the analyses to ascertain whether the same findings would obtain absent the control for formal administrative training. In virtually all cases, the findings did not change. We also split the sample into different decades or twenty-year intervals to determine whether an Ivy degree was worth more during a given cover decade. We could detect no differences in this respect. Nor

were there any differences in the ages (52.9 and 53 years) at which Ivy vs. non-Ivy CEOs appeared on the covers. Finally, the Ivy advantage did not seem to differ between industries with different levels of volatility. In short, the Ivy advantage remained more or less the same except for the variables used to define our subsample analyses of Tables 4.3 to 4.6 – namely the level of the degree, the age of the CEO, the size of the firm and the era of graduation.

Some authors claim that the Ivy list should be expanded to include a few other prestigious universities (Zhang, 2012). Thus to further substantiate our findings we added CEOs with Stanford and University of Chicago educations to an "expanded Ivy" list. All statistically significant results were robust to these additions. Finally, as Tobin's q may be influenced by intangible assets, we reran all analyses incorporating the common proxy for that variable consisting of a composite of R&D / sales and advertising / sales taken from Compustat. The results did not change in any material way.

Arend (2006) argues that in order to qualify as a resource according to RBV definitions, it should result in superior performance vis-a-vis other organizations for a period of "several consecutive years". To establish how long Ivy CEOs' performance continued to lead that of the non-Ivy cover CEOs we extended our analyses beyond the 3 years of Table 4.2 to 4, 5, 6, and 7 years (at which point the sample became quite small). Superior performance was maintained at the 4, 5, and 6 year marks, but not in year 7, perhaps because by then outperformance is priced in by the market. Thus the Ivy advantage is indeed very durable.

We also wished to assess whether the Ivy advantage would disappear when the Ivy CEO left the firm. Thus we performed comparisons for firms whose Ivy CEOs are no longer present after years 4, 5, 6, and 7 of our analyses. Only in year 4 did the formerly Ivy firm display superior performance – which then disappeared in all subsequent years. Clearly, performance in

our firms was linked to the presence of the Ivy CEO. All robustness analyses are available from the authors.

Finally, we tried to tease out selection vs. education effects by analyzing a sample of Ivy dropouts. Although our dropout sample was too small to show statistical significance, the firms of dropout CEOs did no worse than the firms of the Ivy graduates. Nor was the statistical significance of our findings influenced by whether or not we included dropouts in our analysis. Thus admission-based talent screening may be a key role performed by Ivy universities.

4.4 Discussion and Conclusion

Recent studies have found a decline in the prevalence of CEOs from Ivy League universities (Keiser, 2004; Martelli & Abels, 2010). Some authors have deemed this a product of the ascendance of a meritocracy whereby job performance rather than educational advantage is responsible for promotion and firm performance (Judge et al., 1995; Martelli & Abels, 2010; Sowell, 2008). Yet, if scholars of human capital are correct, and high quality training does enhance the value of human capital (Becker, 1964; Cooper et al., 1994; Flamholtz & Lacey, 1991), then there may be strategic value to an Ivy education. Moreover, Ivy universities perform early-stage screening for outstanding talent and motivation (Zhang, 2008). And despite our findings regarding the meritocratic era, Ivy schools still attract entrants from rich, well-connected families, and that may give their graduates social capital (Palmer & Barber, 2001).

Our finding that Ivy CEOs do better in early career, in small companies, and where CEO-relevant undergraduate program-related skills apply, suggests that an Ivy-connection enhances performance where the CEO has less experience, ample discretion, an especially critical role, and

where there is less risk of rent appropriation. Indeed, the positive effects of the characteristics emphasized by undergraduate programs suggest that there may be a significant executive capability component linked to an Ivy association. Moreover, that more recent graduates did better than those from a prior era suggests that most of the value of an Ivy degree comes from selection or education for talent more than social connections.

In summary, under specific conditions, Ivy selected CEOs can indeed be considered a valuable resource according to the tenets of the resource-based view. Even within our sample of high-performing CEOs who made the cover of national business magazines our Ivy CEOs showed their superiority in three ways. First, they were significantly more likely to appear in this high performing sample than their prevalence among Fortune 500 companies would have predicted. Second, they outperformed in the market valuation accorded their companies by investors – a tough hurdle given the nature of the cover comparison sample. Third, and most important, they sustained their superior post-cover valuations longer than other cover CEOs. Thus if we ask whether human capital as created or signaled by a particular training environment can contribute to sustainable rents – the answer is "yes", under the conditions we have specified.

We remain uncertain of the exact sources of firm value associated with an Ivy undergraduate education – whether it be from astute selection, education, or social capital born of networking. Thus it would be useful for researchers to engage in finer grained research to establish the relative contributions to executive achievement of training, social networks, and exacting selection. Also, whereas we studied Ivy trained CEOs within a group of high performers to establish their status as resources, in order to establish the generality of our findings, future researchers may usefully choose a less selective sample and other early markers of talent. Finally, we have in no way shown that any or all types of education constitute a

resource advantage: Ivy educations are especially selective. It remains unanswered just how broadly we may expand the list of universities and find the same benefit. That question too presents an opportunity for further research.

Table 2.1 Relocation Sample

Panel A. Sample distribution, by years

Year	# Firms	# of Moves
1971	506	
1972	526	6
1973	543	4
1974	559	8
1975	575	5
1976	599	5
1977	618	1
1978	628	3
1979	627	3
1980	610	1
1981	586	6
1982	572	5
1983	559	1
1984	536	1
1985	506	4
1986	489	6
1987	470	4
1988	447	3
1989	438	3
1990	440	3
1991	450	3
1992	465	6
1993	481	8
1994	485	2
1995	489	4
1996	495	3
1997	496	5
1998	479	8
1999	468	8
2000	454	1
2001	1,011	2
2002	1,190	6
2003	1,256	14
2004	1,421	16
2005	1,467	10
2006	2,006	10
2007	2,087	19
2008	2,047	25
Total	28,081	222

Panel B. Relocation distribution, by MSAs

MSA	In	Out	Net
Top 5 Net Move in Locations			
Houston-Sugar Land-Baytown, TX	16	4	12
Dallas-Fort Worth-Arlington, TX	17	5	12
Bridgeport-Stamford-Norwalk, CT	24	13	11
Atlanta-Sandy Springs-Marietta, GA	14	4	10
Chicago-Joliet-Naperville, IL-IN-WI	10	4	6
Top 5 Net Move out Locations			
New York-Northern New Jersey-Long Island, NY-NJ-PA	13	57	-44
Los Angeles-Long Beach-Santa Ana, CA	11	22	-11
San Jose-Sunnyvale-Santa Clara, CA	3	12	-9
Sioux City, IA-NE-SD	0	3	-3
Cleveland-Elyria-Mentor, OH	2	4	-2
Top 5 HQ-Years (Average per Year)			
New York-Northern New Jersey-Long Island, NY-NJ-PA		111	
Chicago-Joliet-Naperville, IL-IN-WI		60	
Los Angeles-Long Beach-Santa Ana, CA		38	
Boston-Cambridge-Quincy, MA-NH		29	
Dallas-Fort Worth-Arlington, TX		29	

Panel C. Headquarters relocation patterns

Panel reports all location pairs that had more than two relocations.

	From (MSAs that lose headquarters)	To (MSAs that attract headquarters)	Numbers
1	New York-Northern New Jersey-Long Island, NY-NJ-PA	Bridgeport-Stamford-Norwalk, CT	19
2	New York-Northern New Jersey-Long Island, NY-NJ-PA	Atlanta-Sandy Springs-Marietta, GA	4
3	Los Angeles-Long Beach-Santa Ana, CA	Houston-Sugar Land-Baytown, TX	4
4	New York-Northern New Jersey-Long Island, NY-NJ-PA	Dallas-Fort Worth-Arlington, TX	3
5	San Jose-Sunnyvale-Santa Clara, CA	San Francisco-Oakland-Fremont, CA	3
6	New York-Northern New Jersey-Long Island, NY-NJ-PA	Charlotte-Gastonia-Rock Hill, NC-SC	3
7	New York-Northern New Jersey-Long Island, NY-NJ-PA	Miami-Fort Lauderdale-Pompano Beach, FL	3
8	Los Angeles-Long Beach-Santa Ana, CA	Dallas-Fort Worth-Arlington, TX	3

Table 2.2 Summary Statistics and Correlations

Table reports summary statistics for main variables for the entire sample (Panel A) and the relocating sample (Panel B). *Q* is tobin's average q, calculated as total assets subtract the book value of equity and plus the market value of equity (price times common shares outstanding), and then divided by total assets. *TFP growth* is calculated as the residual of revenue growth rate net of growth accounted by capital and labour. *ROA* is net income divided by total asset. *SG&A/revenue* measures headquarter efficiency and is the sales, general and administration cost scaled by revenue. *Corporate Tax* is the amount of corporate tax paid divided by pre-tax operating income. *Leverage* is total debt divided by total assets. *Credit rating* is a score corresponding to each credit rating (AAA to SD), where higher scores correspond to lower credit ratings. Correlation matrix is reported for the relocating sample in Panel C for firm level variables, and in Panel D for location level variables.

Panel A. Entire sample

	Obs	Mean	25th	Median	75th	Stdev
Firm Level Variables						
Total assets (mil)	28081	4228	458	1275	3514	8658
Q	28081	1.61	1.02	1.30	1.82	0.975
TFP growth	28081	0.043	-0.022	0.045	0.112	0.183
ROA	28081	0.031	0.017	0.048	0.078	0.109
SG&A /revenue	25717	0.217	0.102	0.180	0.283	0.162
Corporate tax	25254	0.168	0.062	0.176	0.273	0.178
Employees (thousands)	28081	26.5	3.64	11.4	29.5	44.5
Credit rating	11973	11.1	8	11	14	3.86
Leverage	28081	0.249	0.123	0.236	0.344	0.179
GIM	12460	9.33	7.5	9	11	2.60
Location Level Variables						
Per capita income growth	27249	0.057	0.033	0.055	0.081	0.035
Employment growth	27249	0.015	0.003	0.016	0.027	0.021
Population growth	27249	0.009	0.002	0.007	0.014	0.012
Private business growth	21962	0.015	0.004	0.012	0.021	0.025
Natural amenities	27152	3.94	3.00	4.00	4.00	1.43
Crime rate	21962	0.006	0.004	0.005	0.007	0.003
Personal tax (top marginal)	28081	5.80	2.80	6.00	8.25	4.09
Personal tax (burden)	24783	9.90	9.20	9.90	10.60	1.30
Personal tax (capital gains)	24783	4.97	2.50	5.00	7.50	3.21
Corporate income tax	28081	6.86	5.00	7.90	9.00	3.06
Finance	27249	0.054	0.045	0.054	0.064	0.014
Service	27249	0.205	0.139	0.201	0.267	0.073
Population (mil)	27249	5.51	1.41	3.24	8.05	5.63
Wage	27249	33461	18811	33214	45146	16907

Panel B. Relocating sample

	Obs	Mean	25th	Median	75th	Stdev
Firm Level Variables						
Total assets (mil)	222	4619	540	1438	3253	9097
Q	222	1.48	1.03	1.25	1.64	0.816
TFP growth	222	0.077	-0.007	0.059	0.138	0.208
ROA	222	0.008	-0.012	0.032	0.063	0.121
SG&A /revenue	200	0.198	0.089	0.147	0.253	0.164
Corporate tax	191	0.114	0.011	0.087	0.208	0.180
Employees (thousands)	222	25.6	2.70	9.07	30.0	43.0
Credit rating	110	12.3	9.0	12.0	15.3	3.84
Leverage	222	0.303	0.163	0.282	0.390	0.210
GIM	105	9.36	8	9	11	2.47
Location Level Variables						
Per capita income growth	222	0.056	0.033	0.050	0.079	0.035
Employment growth	222	0.020	0.006	0.020	0.033	0.021
Population growth	222	0.013	0.004	0.010	0.022	0.013
Private business growth	177	0.015	0.004	0.014	0.023	0.018
Natural amenities	211	4.10	3.00	4.00	4.00	1.39
Crime rate	177	0.006	0.004	0.005	0.007	0.003
Personal tax (top marginal)	222	4.55	0.00	5.00	7.50	3.77
Personal tax (burden)	194	9.51	8.60	9.50	10.30	1.34
Personal tax (capital gains)	194	4.36	0.00	4.50	6.89	3.37
Corporate income tax	222	6.38	4.80	7.00	8.84	3.30
Finance	222	0.055	0.045	0.056	0.065	0.015
Service	222	0.208	0.151	0.213	0.266	0.070
Population (mil)	222	4.17	1.01	2.62	5.35	4.52
Wage	222	34049	20897	35642	45625	16373

Panel C. Correlation matrix for firm level variables

		1	2	3	4	5	6	7	8	9
1	Total assets (mil)									
2	Q	-0.009								
3	TFP growth	-0.044	0.076							
4	ROA	0.135	0.124	-0.093						
5	SG&A /revenue	-0.118	0.150	0.112	-0.477					
6	Corporate tax	-0.024	0.108	0.015	0.329	-0.043				
7	Employees (thousands)	0.656	-0.063	-0.106	0.168	-0.123	0.078			
8	Credit rating	-0.463	-0.142	0.216	-0.397	0.046	-0.471	-0.445		
9	Leverage	-0.024	-0.062	-0.090	-0.259	-0.066	-0.341	-0.038	0.407	
10	GIM	0.084	-0.067	-0.088	0.144	-0.201	-0.113	0.202	-0.036	0.000

Panel D. Correlation matrix for location level variables

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Per capita income growth													
2	Employment growth	0.457												
3	Population growth	-0.047	0.540											
4	Private business growth	0.272	0.618	0.462										
5	Natural amenities	0.079	0.100	0.058	0.058									
6	Crime rate	-0.335	0.005	0.278	0.214	0.220								
7	Personal tax (top marginal)	-0.063	-0.062	-0.124	-0.019	0.294	0.049							
8	Personal tax (burden)	0.013	-0.222	-0.446	-0.251	0.139	-0.204	0.663						
9	Personal tax (capital gains)	-0.087	-0.155	-0.266	-0.129	0.341	-0.128	0.900	0.710					
10	Corporate income tax	0.077	-0.229	-0.452	-0.156	0.161	-0.142	0.532	0.752	0.639				
11	Finance	-0.242	0.010	0.177	-0.160	0.176	0.262	0.108	0.172	0.110	-0.062			
12	Service	-0.528	-0.187	0.011	-0.393	0.099	0.274	0.150	0.133	0.224	-0.008	0.672		
13	Population (mil)	-0.114	-0.097	-0.137	-0.154	0.118	0.173	0.262	0.341	0.244	0.038	0.306	0.222	
14	Wage	-0.465	-0.183	-0.012	-0.382	0.092	0.238	0.179	0.235	0.274	-0.029	0.660	0.911	0.341

Table 2.3 Relocations and Shareholders

Panel A reports abnormal returns around the relocation announcement date. Panel B reports long-term performance changes for the period of three years after relocations and three years before relocations. We compare performance changes to different comparison groups: industry medians, industry size matched firms, same industry firms that have similar probability of relocation, same industry firms that locate in the same old location and have similar probability of relocation. *Q* is tobin's average q, calculated as total assets subtract the book value of equity and plus the market value of equity (price times common shares outstanding), and then divided by total assets. *TFP growth* is calculated as the residual of revenue growth rate net of growth accounted by capital and labour. *ROA* is net income divided by total asset. *SG&A/revenue* measures headquarter efficiency and is the sales, general and administration cost scaled by total asset. *Corporate Tax* is the amount of corporate tax paid divided by pre-tax operating income. t score corresponds to the mean difference and Wilcoxon signed rank z score corresponds to the median difference. *, **, *** corresponds to significance at 10%, 5%, and 1% respectively.

Panel A. Announcement reactions

Interval	Obs	Mean	t	% Positive	z
AR [0]	127	-0.17%	(-0.56)	46.88%	(-1.05)
CAR [0,1]	127	0.35%	(1.24)	45.31%	(-0.21)
CAR [0,5]	127	0.18%	(0.39)	51.56%	(0.34)
CAR [0,10]	127	0.01%	(0.01)	52.76%	(0.24)
CAR [-1,1]	127	0.40%	(1.32)	53.54%	(1.45)
CAR [-5,5]	127	0.80%	(1.05)	51.18%	(0.79)
CAR [-10,10]	127	0.73%	(0.73)	56.69%	(1.14)

Panel B. Long-term shareholder impact, comparing to the matched sample

	Obs	Mean	t	% Positive	z
Comparison Group: Industry median					
Δ Q	169	-0.046	(-1.40)	50.89%	(-0.60)
Δ TFP growth	169	-0.016	(-1.50)	55.23%	(-0.18)
Δ ROA	169	0.005	(0.97)	51.48%	(1.20)
Δ SG&A/Revenue	169	0.003	(0.88)	46.15%	(0.14)
Δ Corporate Tax	120	0.007	(0.55)	53.39%	(0.67)
Comparison Group: Industry size matched firms					
Δ Q	138	0.041	(0.99)	54.35%	(1.22)
Δ TFP growth	138	-0.035	(-1.65)	50.72%	(-0.55)
Δ ROA	138	0.008	(1.15)	55.07%	(1.31)
Δ SG&A/Revenue	138	0.007	(1.20)	47.83%	(-0.06)
Δ Corporate Tax	88	-0.010	(-0.49)	44.32%	(-0.98)
Comparison Group: Same industry firms, match by probability of moving					
Δ Q	161	0.009	(0.26)	53.99%	(0.39)
Δ TFP growth	161	-0.017	(-0.95)	47.85%	(-0.22)
Δ ROA	161	-0.001	(-0.13)	56.44%	(0.95)
Δ SG&A/at	161	0.006	(1.29)	51.33%	(1.13)
Δ Corporate Tax	90	-0.010	(-0.50)	52.22%	(-0.27)
Comparison Group: Same location-industry firms, match by probability of moving					
Δ Q	78	-0.014	(-0.16)	51.28%	(0.42)
Δ TFP growth	78	-0.031	(-1.18)	39.19%	(-1.26)
Δ ROA	78	0.010	(1.03)	55.13%	(1.30)
Δ SG&A/at	78	-0.010	(-1.35)	42.67%	(-1.40)
Δ Corporate Tax	40	-0.042	(-1.46)	41.03%	(-1.02)

Table 2.4 Relocations, Employees and Creditors

Table reports changes in number of employees, credit ratings and leverages for the period of three years after relocations and three years before relocations. We compare performance changes to different comparison groups: industry medians, industry size matched firms, same industry firms that have similar probability of relocation, same industry firms that locate in the same old location and have similar probability of relocation. *Leverage* is total debt divided by total assets. *Credit rating* is a score that corresponds to each credit rating (AAA to SD), where higher scores mean lower credit ratings. t score corresponds to the mean difference and Wilcoxon signed rank z score corresponds to the median difference. *, **, *** corresponds to significance at 10%, 5%, and 1% respectively.

	Obs	Mean	t	% Positive	z
Comparison Group: Industry median					
Δ Employee (log)	169	-0.050	(-1.32)	42.01%	(-1.47)
Δ Credit rating	75	0.122	(0.70)	49.33%	(0.21)
Δ Leverage	169	-0.001	(-0.06)	50.30%	(0.09)
Comparison Group: Industry size matched firms					
Δ Employee (log)	138	-0.127***	(-3.43)	34.06%***	(-3.71)
Δ Credit rating	88	-0.107	(-0.48)	50.00%	(-0.07)
Δ Leverage	138	-0.005	(-0.47)	50.72%	(-0.19)
Comparison Group: Same industry firms, match by probability of moving					
Δ Employee (log)	161	-0.032	(-0.84)	44.79%	(-1.02)
Δ Credit rating	43	-0.032	(-0.84)	39.47%	(-1.45)
Δ Leverage	161	-0.010	(-0.84)	46.20%	(-0.60)
Comparison Group: Same location-industry firms, match by probability of moving					
Δ Employee (log)	78	-0.069	(-1.28)	41.03%	(-1.29)
Δ Credit rating	17	0.275	(0.43)	53.33%	(0.47)
Δ Leverage	78	0.000	(0.02)	49.35%	(-0.25)

Table 2.5 Relocations and Communities

Table reports changes in community growth rates for the three years after relocations and three years before relocations. Panel A presents community growth rate changes for MSAs that have a net addition and Panel B presents community growth rate changes for MSAs with a net loss of headquarters. We report the growth rate changes, comparing to the US average changes, to a similar sized MSA and to MSAs that have similar probability of attracting/losing headquarters. t score corresponds to the mean difference and Wilcoxon signed rank z score corresponds to the median difference. *, **, *** corresponds to significance at 10%, 5%, and 1% respectively.

Panel A. MSA that attracted HQs

	Obs	Mean	t	% Positive	z
Comparison Group: US average					
Δ Per capita income growth	172	0.08%	(0.77)	54.65%	(1.04)
Δ Employment growth	172	0.09%	(0.80)	56.98%	(1.17)
Δ Population growth	172	-0.03%	(-0.54)	50.00%	(-0.17)
Δ Private business growth	105	0.04%	(0.37)	49.52%	(0.23)
Comparison Group: Similar sized MSAs					
Δ Per capita income growth	159	0.08%	(0.52)	50.31%	(0.54)
Δ Employment growth	159	0.27%	(1.43)	56.60%*	(1.76)
Δ Population growth	159	0.03%	(0.36)	52.79%	(0.54)
Δ Private business growth	99	0.18%	(0.97)	53.50%	(0.98)
Comparison Group: MSAs that have closest probability of attracting HQs					
Δ Per capita income growth	164	0.05%	(0.32)	52.91%	(0.55)
Δ Employment growth	164	0.02%	(0.17)	52.33%	(0.25)
Δ Population growth	164	-0.08%	(-1.08)	48.84%	(-0.95)
Δ Private business growth	101	0.02%	(0.12)	52.38%	(0.20)

Panel B. MSA that lost HQs

	Obs	Mean	t	% Positive	z
Comparison Group: US average					
Δ Per capita income growth	149	-0.02%	(-0.19)	48.32%	(-0.19)
Δ Employment growth	149	0.16%	(1.53)	52.60%	(1.56)
Δ Population growth	149	0.05%	(1.09)	53.02%	(1.15)
Δ Private business growth	92	0.06%	(0.45)	50.00%	(0.44)
Comparison Group: Similar sized MSAs					
Δ Per capita income growth	119	-0.11%	(-0.61)	45.37%	(-0.52)
Δ Employment growth	119	0.21%	(1.20)	56.30%	(1.12)
Δ Population growth	119	0.00%	(0.01)	52.94%	(0.01)
Δ Private business growth	74	0.07%	(0.35)	48.65%	(0.26)
Comparison Group: MSAs that have closest probability of losing HQs					
Δ Per capita income growth	113	0.15%	(0.96)	53.69%	(0.32)
Δ Employment growth	113	0.24%	(1.59)	53.69%	(0.98)
Δ Population growth	113	0.09%	(1.19)	47.65%	(0.31)
Δ Private business growth	70	0.16%	(1.16)	55.43%	(1.15)

Table 2.6 Relocations and Managerial Interest

Panel A compares living conditions and personal tax rates for the move-in and move-out locations. Personal tax rates are all in percentages. t score corresponds to the mean difference and Wilcoxon signed rank z score corresponds to the median difference. Panel B reports logit regression results for personal interest and relocation decisions. Dependent variable equals to 1 if an MSA is chosen in a given year and 0 otherwise. Independent variables include changes in local characteristics, measured as the potential MSA's local characteristics subtract the move-out MSA's local characteristics. Year dummies are included. Panel C reports regressions results at location-year level and use lagged local characteristics to predict next year's net move in of headquarters. Dependent variable is the net move numbers—where a positive number represents a net move in and negative number represents a net move out. Standard errors are clustered at state level. t scores are in brackets. *, **, *** corresponds to significance at 10%, 5%, and 1% respectively.

Panel A. Univariate comparisons

	Obs	Old	New	Old-New	t	% Positive	z
Living environment							
Natural amenities	211	4.35	4.10	0.25**	(2.05)	43.88%*	(1.74)
Crime rate	177	0.006	0.006	0.000	(0.62)	50.59%	(0.40)
Personal tax							
Personal tax (top marginal)	222	7.12	4.55	2.57***	(6.54)	33.51%***	(5.51)
Personal tax (burden)	194	10.09	9.51	0.58***	(4.63)	32.23%***	(4.61)
Personal tax (capital gains)	194	5.48	4.36	1.12***	(3.66)	39.08%***	(3.36)

Panel B. Location choices and managerial interest

	Chosen		
Δ Personal tax (top marginal)	-0.053***		
	(-2.70)		
Δ Personal tax (burden)		-0.242***	
		(-4.74)	
Δ Personal tax (capital gains)			-0.048**
			(-2.25)
Δ Natural	0.065	0.043	0.070
	(1.38)	(0.90)	(1.50)
Δ Crime rate	21.980	4.458	15.761
	(0.87)	(0.18)	(0.63)
Δ Corporate income tax rate	-0.032	-0.015	-0.038*
	(-1.48)	(-0.77)	(-1.71)
Δ Population (mil)	0.020	0.030*	0.018
	(1.34)	(1.95)	(1.17)
Δ Wage (000s)	0.029***	0.031***	0.030***
	(3.05)	(3.26)	(3.06)
Δ % Finance industry	8.473***	10.889***	8.660***
	(2.94)	(3.88)	(2.92)
Δ % Service industry	2.046	2.641*	2.344
	(1.41)	(1.79)	(1.62)
Δ Same industry employment	1.136	1.994*	1.725
	(1.00)	(1.76)	(1.52)
Distance (log)	-0.496***	-0.490***	-0.498***
	(-5.69)	(-5.64)	(-5.72)
Constant	-1.376**	-1.471**	-1.334**
	(-2.37)	(-2.44)	(-2.20)
Obs	31,447	31,447	31,447
Pseudo-R2	0.064	0.066	0.062

Panel C. MSA net move numbers and personal interest

	Net Move Numbers			Net Move Numbers		
Personal tax (top marginal)	-0.006*			-0.022**		
	(-1.84)			(-2.47)		
Personal tax (burden)		-0.029***			-0.042**	
		(-3.18)			(-2.53)	
Personal tax (capital gains)			-0.005*			-0.008
			(-1.76)			(-1.14)
Natural	-0.009	-0.012***	-0.009	-0.045***	-0.045***	-0.045***
	(-1.64)	(-2.82)	(-1.52)	(-2.86)	(-2.77)	(-2.82)
Crime rate	-3.392	-5.616	-3.882	-7.110	-7.187	-7.231
	(-0.84)	(-1.21)	(-0.91)	(-1.05)	(-1.03)	(-1.05)
Corporate tax rate	-0.006*	-0.003	-0.006*	-0.009	-0.014	-0.015
	(-1.86)	(-1.55)	(-1.96)	(-0.56)	(-0.65)	(-0.71)
Population (mil), log	0.019*	0.020**	0.019*	0.023**	0.024**	0.024**
	(1.94)	(2.19)	(1.97)	(2.07)	(2.05)	(2.04)
Wage (000s), log	-0.134	-0.103	-0.133	-0.140	-0.150	-0.149
	(-1.31)	(-0.95)	(-1.30)	(-0.88)	(-0.95)	(-0.93)
% Finance industry	-0.248	-0.179	-0.241	-0.564	-0.588	-0.585
	(-0.44)	(-0.34)	(-0.43)	(-0.71)	(-0.74)	(-0.73)
% Service industry	0.006	0.082	0.032	0.235	0.216	0.205
	(0.03)	(0.40)	(0.16)	(1.10)	(1.07)	(0.96)
Constant	1.138	1.044	1.106	1.292	1.649	1.313
	(1.19)	(1.04)	(1.14)	(0.85)	(1.06)	(0.87)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
State dummies				Yes	Yes	Yes
Observations	3,561	3,561	3,561	3,561	3,561	3,561
Adj R2	0.011	0.014	0.010	0.032	0.030	0.029

Table 2.7 When does Personal Tax Rate Drop More?

Table reports changes in personal tax rates, partitioning sample by high and low pre-tax compensations (Panel A) and the time of executive turnovers (Panel B). Turnover [t-3,t-1] corresponds to the cases when there is a change of CEO in the three years before the relocation announcement date. Turnover [t+1, t+3] corresponds to the cases when there is a change of CEO in the three years after relocation announcement date. High compensation is the group of CEOs with top quartile total compensation (over 5 millions-inflation adjusted in year 2005's dollars); while low compensation is the group with bottom quartile compensation (below 1.8 million). t score corresponds to the mean difference and Wilcoxon signed rank z score corresponds to the median difference. *, **, *** corresponds to significance at 10%, 5%, and 1% respectively.

Panel A. CEO compensations

	High Compensation			Low Compensation		
	Obs	**New-Old**	**%Positive**	**Obs**	**New-Old**	**%Positive**
Δ Personal tax (top marginal)	25	-1.731**	20.00%**	26	-0.621	47.62%
		(-2.99)	(-2.51)		(-0.78)	(-0.46)
Δ Personal tax (burden)	25	-0.500*	31.25%*	26	-0.200	42.86%
		(-1.77)	(-1.64)		(-0.68)	(-0.68)
Δ Personal tax (capital gains)	25	-1.974***	20.00%***	26	-0.495	52.38%
		(-3.26)	(-2.59)		(-0.66)	(-0.23)

Panel B. Executive turnovers

	Turnover [-3, -1]			Turnover [1, 3]		
	Obs	**New-Old**	**%Positive**	**Obs**	**New-Old**	**%Positive**
Δ Personal tax (top marginal)	72	-1.038**	41.51%**	13	-0.265	53.85%
		(-2.13)	(-2.08)		(-0.28)	(0.46)
Δ Personal tax (burden)	72	-0.269	48.65%	13	0.254	50.00%
		(-1.53)	（-0.36）		(0.91)	(0.51)
Δ Personal tax (capital gains)	72	-0.927*	43.40%*	13	-0.508	40.00%
		(-1.93)	(-1.79)		(-0.56)	(-0.61)

Table 2.8 Does Better Governance Help?

Panel A reports shareholder reactions to relocation announcement, partitioning the sample by median GIM score. Panel B reports the personal tax rate changes (new states-old states), by GIM score. High GIM firms represent poorly governed firms (with more takeover defense techniques), while low GIM firms represent the opposite. t score corresponds to the mean difference and Wilcoxon signed rank z score corresponds to the median difference. *, **, *** corresponds to significance at 10%, 5%, and 1% respectively.

Panel A. Stock Market Reactions

	Well-governed firms (Low GIM)			Poorly-governed firms (High GIM)		
	Obs	**New-Old**	**%Positive**	**Obs**	**New-Old**	**%Positive**
AR [0]	21	0.26%	52.38%	29	0.39%	51.72%
		(0.47)	(0.40)		(1.08)	(0.53)
CAR [0,1]	21	1.67%**	66.67%**	29	-0.03%	41.38%
		(2.33)	(2.00)		(-0.05)	(-0.25)
CAR [0,5]	21	4.24%***	80.95%***	29	0.21%	44.83%
		(4.38)	(3.18)		(0.27)	(-0.03)
CAR [0,10]	21	3.66%***	80.00%**	29	1.11%	58.62%
		(2.80)	(2.55)		(1.20)	(1.50)
CAR [-1,1]	21	1.40%**	57.14%*	29	-0.40%	37.93%
		(2.21)	(1.65)		(-0.93)	(-1.57)
CAR [-5,5]	21	4.29%***	75.00%***	29	0.97%	44.83%
		(2.95)	(2.58)		(0.84)	(0.12)
CAR [-10,10]	21	5.57%***	75.00%**	29	0.75%	62.07%
		(2.78)	(2.39)		(0.57)	(0.60)

Panel B. Personal Tax Rate

	Well-governed firms (Low GIM)			Poorly-governed firms (High GIM)		
	Obs	**New-Old**	**%Positive**	**Obs**	**New-Old**	**%Positive**
Δ Personal tax (top marginal)	45	0.143	63.33%	62	-0.896*	41.30%*
		-0.27	-0.49		(-1.79)	(-1.63)
Δ Personal tax (burden)	45	-0.096	46.67%	62	-0.189	39.58%
		(-0.41)	(-0.48)		(-0.99)	(-1.00)
Δ Personal tax (capital gains)	45	-0.155	56.67%	62	-0.883*	40.43%
		(-0.30)	(-0.07)		(-1.73)	(-1.59)

Table 3.1 Sample Summary Statistics

This table reports summary statistics of insider buys and key variables. Panel A shows insider buy samples and summary statistics. DACC is measured using the log of moving sum of absolute accruals over the past three years. Real earnings management is the log of the moving sum of absolute discretionary SG&A over the past three years. Firm specific return variation is the log transformation of the moving sum of the R^2 over the past three years, calculated as log ((1- R^2)/ R^2). Book to market ratio is the book equity value divided by market equity value at last year's fiscal year end. Trading volume is the volume of each insider buy in our sample. Illiquidity is calculated as abs(ret)/(abs(prc)*vol*1,000,000). Panel B divides the sample according to the party of transaction. Board includes all transactions from board directors. Officers are corporate executives as defined by SEC. Top manager (Top Mng) includes Chairman, President, CEO and COO. Top financial officers (Top Fin) include CFO, controller and treasurer. Beneficial owners (Benown) are blockholders holding no less than 10% of the equity securities in the firm. Non-beneficial-owner insiders (Non-Benown) include all insider groups besides beneficial owners. Panel C reports correlations between key variables.

Panel A. Summary Statistics.

	n	Mean	Q25	Median	Q75	Stdev
DACC (log)	193340	-1.59	-2.13	-1.61	-1.04	0.823
Real Earnings Management (log)	191330	-0.934	-1.61	-0.876	-0.236	0.956
Firm Specific Return Variation	219717	1.71	0.67	1.73	2.77	1.59
Total Assets (log)	268494	4.96	3.61	4.77	6.19	1.86
Book to market	263171	0.677	0.300	0.527	0.906	0.534
Trade volume	268949	38994	1000	3000	10000	612911
Illiquidity	263016	0.324	0.002	0.016	0.140	0.983
# of firms			8091			
# firm-year			43012			
# of trades			268949			
# of trades/firm year			6.25			
# of trades/firm			33.2			

Panel B. Insider Buys By Year and Insider Categories.

Year	# of Firms	# of Trades	Trades/Firm	Board	Officer	% of Trades Top Mng	Top Fin	Benown
1987	362	1835	5.07	57%	28%	7%	0%	12%
1988	1613	7400	4.59	54%	24%	8%	0%	19%
1989	1561	6967	4.46	52%	26%	8%	0%	20%
1990	1803	10584	5.87	53%	29%	9%	0%	16%
1991	1565	6880	4.40	49%	23%	8%	0%	23%
1992	1646	6900	4.19	47%	31%	10%	4%	19%
1993	1829	7613	4.16	49%	28%	9%	4%	19%
1994	2233	10635	4.76	51%	33%	11%	4%	16%
1995	2306	10795	4.68	51%	32%	11%	5%	19%
1996	2671	14790	5.54	52%	37%	15%	5%	23%
1997	2749	15986	5.82	54%	39%	16%	6%	22%
1998	2968	24920	8.40	52%	37%	17%	6%	24%
1999	2637	21647	8.21	52%	38%	17%	6%	26%
2000	2450	18682	7.63	56%	43%	20%	6%	20%
2001	2003	14099	7.04	60%	41%	20%	6%	19%
2002	1857	14929	8.04	51%	37%	17%	6%	29%
2003	1440	7805	5.42	52%	37%	16%	6%	27%
2004	1401	7079	5.05	53%	32%	13%	6%	27%
2005	1336	7545	5.65	50%	29%	13%	6%	32%
2006	1349	7131	5.29	50%	28%	14%	5%	34%
2007	1413	9311	6.59	47%	28%	13%	6%	34%
2008	1764	19174	10.9	43%	28%	14%	4%	40%
2009	1280	11510	8.99	43%	26%	14%	4%	43%
2010	776	4732	6.10	42%	25%	14%	4%	46%

Panel C. Correlation Matrix.

	DACC (log)	Real Earnings Management(log)	Firm Specific Return Variation	Total Assets (log)
Real Earnings Management(log)	0.305			
	(16.98)			
Firm Specific Return Variation	0.106	0.106		
	(3.72)	(1.33)		
Total Assets (log)	-0.366	-0.260	-0.575	
	(17.96)	(3.61)	(18.21)	
Book to Market	-0.080	-0.098	0.166	0.011
	(4.04)	(5.46)	(10.78)	(0.75)

Table 3.2 Announcement Reactions

This table shows daily abnormal returns (all values in %s) surrounding the insider trading date by insider categories. Abnormal returns are calculated using the market model. Board includes all transactions from board directors. Officers are corporate executives as defined by SEC. Top manager (Top Mng) includes Chairman, President, CEO and COO. Top Fin includes CFO, controller and treasurer. Beneficial owners (Benown) are blockholders holding no less than 10% of the equity securities in the firm. Non-beneficial-owner insiders (Non-Benown) include all insider groups besides beneficial owners. Standard errors are clustered by firm. t-statistics are in the parenthesis. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

	All	Board	Officer	Top Mng	Top Fin	Non- Benown	Benown
-5	-0.136***	-0.145***	-0.220***	-0.154***	-0.324***	-0.172***	-0.029
	(9.97)	(8.54)	(9.17)	(5.00)	(6.09)	(10.95)	(0.98)
-4	-0.156***	-0.177***	-0.249***	-0.201***	-0.281***	-0.197***	-0.037
	(11.35)	(10.19)	(10.42)	(6.39)	(5.30)	(12.37)	(1.44)
-3	-0.201***	-0.221***	-0.317***	-0.220***	-0.439***	-0.256***	-0.045
	(13.67)	(11.54)	(12.42)	(6.26)	(7.77)	(14.83)	(1.37)
-2	-0.243***	-0.260***	-0.426***	-0.333***	-0.618***	-0.316***	-0.032
	(14.99)	(12.25)	(15.10)	(8.85)	(9.90)	(16.76)	(1.13)
-1	-0.202***	-0.220***	-0.355***	-0.247***	-0.549***	-0.271***	-0.003
	(11.61)	(9.96)	(11.86)	(6.32)	(8.94)	(13.37)	(0.12)
0	0.416***	0.486***	0.493***	0.710***	0.324***	0.447***	0.327***
	(11.48)	(18.18)	(15.23)	(15.18)	(4.65)	(19.10)	(3.23)
1	0.485***	0.536***	0.564***	0.621***	0.681***	0.515***	0.398***
	(22.18)	(26.31)	(20.72)	(16.79)	(10.98)	(28.07)	(7.79)
2	0.370***	0.397***	0.495***	0.533***	0.586***	0.411***	0.251***
	(20.74)	(22.05)	(19.88)	(15.83)	(10.37)	(24.82)	(7.11)
3	0.281***	0.300***	0.375***	0.403***	0.436***	0.302***	0.221***
	(17.78)	(17.21)	(15.93)	(11.68)	(7.68)	(19.13)	(7.00)
4	0.219***	0.250***	0.274***	0.285***	0.352***	0.249***	0.132***
	(16.16)	(15.15)	(12.80)	(9.79)	(6.95)	(16.86)	(5.28)
5	0.192***	0.200***	0.260***	0.262***	0.292***	0.208***	0.145***
	(14.92)	(12.61)	(11.86)	(8.60)	(5.90)	(14.62)	(6.38)
[0,10]	2.62***	2.91***	3.31***	3.69***	3.62***	2.89***	1.86***
	(24.68)	(37.37)	(33.91)	(26.45)	(19.34)	(40.33)	(7.48)
[0,20]	3.76***	4.29***	5.08***	5.54***	5.72***	4.33***	2.12***
	(21.17)	(36.00)	(35.05)	(25.34)	(21.36)	(39.50)	(5.27)
[0,60]	6.49***	7.69***	9.57***	10.1***	11.0***	7.96***	2.24***
	(18.40)	(31.36)	(30.74)	(21.99)	(20.70)	(35.43)	(3.02)
[0,120]	9.15***	11.3***	13.9***	15.3***	16.0***	11.5***	2.36*
	(16.26)	(26.98)	(28.80)	(20.44)	(18.69)	(30.23)	(1.88)

Table 3.3 Univariate

This table shows the average CAR[0, 5] (all values in %s) for insider buys across different insider categories and opacity groups. Opacity measures, DACC (in Panel A), real earnings management (in Panel B), and firm specific return (in Panel C) are divided into low/median/high groups. In addition, Panel C also presents the average stock market reactions by firm specific return variation and firm size (big/median/small). Abnormal returns are calculated using the market model. Board includes all transactions from board directors. Officers are corporate executives as defined by SEC. Top manager includes Chairman, President, CEO and COO. Top financial officers (Top Fin) include CFO, controller and treasurer. Beneficial owners are blockholders holding no less than 10% of the equity securities in the firm. Non-beneficial-owner insiders include all insider groups besides beneficial owners. DACC is measured using the log of moving sum of absolute accruals over the past three years. Real earnings management is the log of the moving sum of absolute discretionary SG&A over the past three years. Firm specific return variation is the log transformation of the moving sum of the R^2 over the past three years, calculated as log ((1- R^2)/ R^2). t-statistics are in parenthesis. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

Panel A. By Accruals Earnings Management (DACC).

	CAR						
	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
Low	1.494***	1.489***	1.742***	2.058***	1.728***	1.477***	1.547***
	(16.25)	(15.32)	(15.73)	(11.73)	(8.79)	(17.58)	(6.90)
Median	1.679***	2.055***	2.177***	2.451***	2.019***	1.963***	1.053**
	(7.64)	(20.66)	(17.54)	(13.62)	(9.42)	(19.71)	(2.55)
High	2.234***	2.545***	2.870***	3.191***	3.392***	2.510***	1.547***
	(15.60)	(20.54)	(17.33)	(16.23)	(10.68)	(21.53)	(4.74)
High-Low	0.740***	1.056***	1.128***	1.133***	1.664***	1.032***	-0.000
t	(4.37)	(6.70)	(5.70)	(4.30)	(4.45)	(7.23)	(0.00)

Panel B. By Real Earnings Management.

	CAR						
	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
Low	1.404***	1.634***	1.947***	2.182***	2.221***	1.574***	0.993**
	(6.65)	(15.62)	(15.51)	(12.35)	(7.72)	(15.19)	(2.11)
Median	1.901***	2.046***	2.323***	2.671***	2.107***	2.018***	1.545***
	(19.49)	(19.91)	(16.61)	(14.44)	(9.66)	(20.53)	(7.55)
High	2.089***	2.224***	2.434***	2.679***	2.875***	2.189***	1.769***
	(19.12)	(20.22)	(17.85)	(14.55)	(10.75)	(21.94)	(6.67)
High-Low	0.685***	0.590***	0.488***	0.497*	0.653*	0.615***	0.776
t	(2.88)	(3.91)	(2.63)	(1.95)	(1.66)	(4.28)	(1.44)

Panel C. By Firm Specific Return Variation.

	CAR						
	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
Low	1.698***	1.707***	1.990***	2.447***	2.129***	1.670***	1.811***
	(19.65)	(17.19)	(16.40)	(12.90)	(9.60)	(19.95)	(8.46)
Median	1.713***	2.046***	2.268***	2.542***	2.457***	2.032***	1.041***
	(8.47)	(20.40)	(16.46)	(13.82)	(11.01)	(20.72)	(2.77)
High	1.781***	2.053***	2.325***	2.460***	2.506***	1.995***	1.199***
	(16.60)	(20.55)	(18.21)	(14.71)	(8.95)	(20.89)	(4.86)
High-Low	0.083	0.346**	0.335*	0.013	0.377	0.325**	-0.613*
t	(0.61)	(2.46)	(1.89)	(0.05)	(1.06)	(2.56)	(1.89)

By Size and Firm Specific Return Variation:

Firm Specific Return Variation/Firm Size	Small	Median	Big
Low	2.605***	2.399***	1.358***
	(14.35)	(14.76)	(11.13)
Median	1.819***	2.093***	1.028***
	(8.09)	(13.22)	(9.47)
High	2.002***	1.841***	0.715***
	(13.29)	(12.11)	(2.70)
High-Low	-0.602**	-0.558**	-0.644**
t	(2.57)	(2.51)	(2.21)

Table 3.4 DACC and Stock Market Reactions of Insider Trades

Regression of stock market reaction on DACC, controlling for size and book to market ratio. Panel A reports the full regression using CAR[0,5] as the dependent variable. Panel B reports the coefficient of DACC with alternative CAR windows up to 120 trading days (approximately 6 months). Abnormal returns are estimated using the market model. DACC is the log of the moving sum of absolute accruals over the past three years. We use the log of one year lagged total asset to control for size. Book to market ratio is the book equity value divided by market equity value at last year's fiscal year end. Board includes all transactions from board directors. Officers are corporate executives as defined by SEC. Top manager(Top Mng) includes Chairman, President, CEO and COO. Top financial officers (Top Fin) include CFO, controller and treasurer. Beneficial owners (Benown) are blockholders holding no less than 10% of the equity securities in the firm. Non-beneficial-owner insiders (Non-Benown) include all insider groups besides beneficial owners. t-statistics are in the parenthesis. All models include year dummies. Standard errors are clustered by firm. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

Panel A. Main Regressions (CAR [0,5]).

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
DACC (log)	0.003***	0.004***	0.006***	0.005***	0.008***	0.004***	0.001
	(3.48)	(5.13)	(5.00)	(3.33)	(4.01)	(5.42)	(0.39)
Assets (log)	-0.002***	-0.002***	-0.002***	-0.002**	-0.001	-0.002***	-0.002
	(3.18)	(5.66)	(3.35)	(2.44)	(1.22)	(5.81)	(1.35)
Book to Market	0.014***	0.013***	0.015***	0.014***	0.020***	0.014***	0.014***
	(10.84)	(9.85)	(9.07)	(6.43)	(5.84)	(11.22)	(5.01)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	192971	95967	63362	27474	9495	138606	54365
R-squared	0.01	0.01	0.02	0.02	0.02	0.02	0.01

Panel B. Alternative CAR Windows.

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
CAR [0,1]							
DACC (log)	0.002***	0.002***	0.002***	0.003***	0.003***	0.002***	0.001
	(3.76)	(4.71)	(4.25)	(3.30)	(2.99)	(5.22)	(0.89)
CAR [0,3]							
DACC (log)	0.003***	0.003***	0.004***	0.004***	0.007***	0.003***	0.001
	(3.41)	(5.09)	(4.69)	(3.26)	(4.33)	(5.30)	(0.48)
CAR [0,10]							
DACC (log)	0.005***	0.007***	0.008***	0.008***	0.012***	0.007***	0.000
	(3.62)	(5.89)	(4.76)	(3.76)	(4.35)	(5.91)	(0.11)
CAR [0,20]							
DACC (log)	0.007***	0.010***	0.010***	0.012***	0.016***	0.009***	0.000
	(3.29)	(5.45)	(4.26)	(3.34)	(4.07)	(5.40)	(0.07)
CAR [0,60]							
DACC (log)	0.014***	0.018***	0.016***	0.019**	0.014*	0.017***	0.007
	(3.37)	(4.84)	(2.99)	(2.55)	(1.84)	(4.82)	(0.77)
CAR [0,120]							
DACC (log)	0.024***	0.031***	0.034***	0.042***	0.032**	0.031***	0.008
	(3.12)	(4.70)	(4.25)	(3.67)	(2.43)	(5.33)	(0.43)

Table 3.5 Real Earnings Management and Stock Market Reactions of Insider Trades

Regression of stock market reactions on real earnings management (RM), controlling for size and book to market ratio. Panel A reports the full regression using CAR[0,5] as the dependent variable. Panel B reports the coefficient of RM with alternative CAR windows up to 120 trading days (approximately 6 months). Abnormal returns are estimated using the market model. Real earnings management is the log of the moving sum of absolute discretionary SG&A over the past three years. We use the log of one year lagged total asset to control for size. Book to market ratio is the book equity value divided by market equity value at last year's fiscal year end. Board includes all transactions from board directors. Officers are corporate executives as defined by SEC. Top manager(Top Mng) includes Chairman, President, CEO and COO. Top financial officers (Top Fin) include CFO, controller and treasurer. Beneficial owners (Benown) are blockholders holding no less than 10% of the equity securities in the firm. Non-beneficial-owner insiders (Non-Benown) include all insider groups besides beneficial owners. t-statistics are in the parenthesis. All models include year dummies. Standard errors are clustered by firm. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

Panel A. Main Regressions (CAR [0,5]).

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
RM(log)	0.003**	0.001**	0.002**	0.001	0.004**	0.002***	0.004**
	(2.41)	(2.08)	(2.07)	(1.13)	(2.22)	(2.86)	(2.14)
Assets (log)	-0.002***	-0.002***	-0.002***	-0.002***	-0.002**	-0.002***	-0.001
	(4.86)	(7.64)	(4.98)	(2.99)	(2.41)	(7.96)	(1.22)
Book to Market	0.013***	0.013***	0.014***	0.013***	0.019***	0.013***	0.013***
	(10.64)	(10.02)	(8.19)	(5.80)	(5.56)	(10.86)	(4.54)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	190941	97292	64626	28106	9338	141542	49399
R-squared	0.01	0.01	0.01	0.01	0.02	0.01	0.01

Panel B. Alternative CAR Windows.

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
CAR [0,1]							
RM (log)	0.002***	0.001***	0.002***	0.002**	0.002*	0.001***	0.002**
	(2.85)	(2.67)	(3.63)	(2.38)	(1.82)	(3.62)	(2.27)
CAR [0,3]							
RM (log)	0.002**	0.001**	0.002**	0.001	0.003**	0.002***	0.003**
	(2.34)	(2.18)	(2.26)	(1.12)	(2.16)	(2.88)	(2.05)
CAR [0,10]							
RM (log)	0.003**	0.001	0.003**	0.003	0.004*	0.002**	0.004
	(2.18)	(1.27)	(2.06)	(1.43)	(1.75)	(2.50)	(1.55)
CAR [0,20]							
RM (log)	0.005***	0.004**	0.005***	0.006**	0.006**	0.005***	0.004
	(2.81)	(2.48)	(2.60)	(2.09)	(2.03)	(3.55)	(1.09)
CAR [0,60]							
RM (log)	0.013***	0.012***	0.017***	0.014***	0.019***	0.015***	0.002
	(3.98)	(4.18)	(4.61)	(2.79)	(3.11)	(5.90)	(0.23)
CAR [0,120]							
RM (log)	0.024***	0.020***	0.027***	0.024***	0.034***	0.025***	0.014
	(4.08)	(4.20)	(4.79)	(2.90)	(3.66)	(5.50)	(1.12)

Table 3.6 Firm Specific Return Variation and Stock Market Reactions of Insider Trades

Regression of stock market reaction on firm specific return variation, controlling for size and book to market ratio. Panel A reports the full regression using CAR[0,5] as the dependent variable. Panel B reports the coefficient of firm specific return variation with alternative CAR windows up to 120 trading days (approximately 6 months). Abnormal returns are estimated using the market model. Firm specific return variation is the log transformation of the moving sum of the R^2 over the past three years, calculated as log $((1- R^2)/ R^2)$. We use the log of one year lagged total asset to control for size. Book to market ratio is the book equity value divided by market equity value at last year's fiscal year end. Board includes all transactions from board directors. Officers are corporate executives as defined by SEC. Top manager(Top Mng) includes Chairman, President, CEO and COO. Top financial officers (Top Fin) include CFO, controller and treasurer. Beneficial owners (Benown) are blockholders holding no less than 10% of the equity securities in the firm. Non-beneficial-owner insiders (Non-Benown) include all insider groups besides beneficial owners. t-statistics are in the parenthesis. All models include year dummies. Standard errors are clustered by firm. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

Panel A. Main Regressions (CAR [0,5]).

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
Firm Specific Return Variation	-0.003***	-0.005***	-0.004***	-0.005***	-0.006***	-0.004***	-0.002
	(5.33)	(8.96)	(6.79)	(5.69)	(4.51)	(9.54)	(1.37)
Assets (log)	-0.004***	-0.005***	-0.005***	-0.005***	-0.006***	-0.005***	-0.002**
	(8.91)	(13.58)	(9.90)	(7.40)	(5.54)	(14.78)	(2.28)
Book to Market	0.014***	0.015***	0.015***	0.015***	0.020***	0.015***	0.013***
	(12.62)	(12.32)	(9.52)	(7.19)	(6.15)	(13.09)	(5.31)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	219064	111359	71347	30943	9725	161013	58051
R-squared	0.01	0.02	0.02	0.02	0.02	0.02	0.01

Panel B. Alternative CAR Windows.

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
CAR [0,1]							
Firm Specific Return Variation	-0.001***	-0.002***	-0.001***	-0.002***	-0.001	-0.001***	-0.001
	(3.77)	(5.82)	(3.53)	(4.11)	(1.34)	(5.65)	(1.58)
CAR [0,3]							
Firm Specific Return Variation	-0.002***	-0.003***	-0.003***	-0.004***	-0.004***	-0.003***	-0.001
	(4.97)	(7.93)	(6.51)	(5.63)	(4.01)	(8.75)	(1.37)
CAR [0,10]							
Firm Specific Return Variation	-0.006***	-0.007***	-0.007***	-0.009***	-0.010***	-0.007***	-0.003
	(6.54)	(10.24)	(8.17)	(6.61)	(5.41)	(10.97)	(1.47)
CAR [0,20]							
Firm Specific Return Variation	-0.009***	-0.011***	-0.012***	-0.014***	-0.017***	-0.011***	-0.004
	(6.72)	(10.46)	(8.72)	(6.95)	(6.44)	(11.02)	(1.51)
CAR [0,60]							
Firm Specific Return Variation	-0.023***	-0.024***	-0.028***	-0.029***	-0.033***	-0.025***	-0.018***
	(8.31)	(10.78)	(9.26)	(6.49)	(6.68)	(12.27)	(3.18)
CAR [0,120]							
Firm Specific Return Variation	-0.040***	-0.039***	-0.049***	-0.050***	-0.057***	-0.042***	-0.036***
	(9.58)	(10.44)	(10.68)	(7.37)	(7.35)	(11.88)	(4.01)

Table 3.7 Accounting Opacity, Firm Specific Return Variation and Insider Trading Informativeness

Regression of stock market reactions on the interaction between high firm specific return variation and DACC (in Panel A and B) and real earnings management (in Panel C and D), controlling for size and book to market ratio. We report main regression results (CAR[0,5] as the dependent variable) in Panel A and C; In Panel B and D, we only report the coefficients of the interaction terms for alternative CAR windows. Abnormal returns are estimated using the market model. DACC is the log of the moving sum of absolute accruals over the past three years. Real earnings management is the log of the moving sum of absolute discretionary SG&A over the past three years. Firm specific return variation is the log transformation of the moving sum of the R^2 over the past three years, calculated as log ((1- R^2)/ R^2). High firm specific return variation is a dummy variable that equals to 1 if the firm has above median firm specific return variation. We use the log of one year lagged total asset to control for size. Book to market ratio is the book equity value divided by market equity value at last year's fiscal year end. Board includes all transactions from board directors. Officers are corporate executives as defined by SEC. Top manager(Top Mng) includes Chairman, President, CEO and COO. Top financial officers (Top Fin) include CFO, controller and treasurer. Beneficial owners (Benown) are blockholders holding no less than 10% of the equity securities in the firm. Non-beneficial-owner insiders (Non-Benown) include all insider groups besides beneficial owners. t-statistics are in the parenthesis. All models include year dummies. Standard errors are clustered by firm. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

Panel A. DACC and Firm Specific Return Variation-Main Regression.

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
DACC (log)	0.005***	0.004***	0.006***	0.004**	0.009***	0.005***	0.006***
	(4.32)	(3.85)	(3.85)	(1.97)	(3.41)	(4.11)	(2.70)
High Firm Specific Return Variation	-0.020***	-0.015***	-0.015***	-0.015***	-0.014*	-0.016***	-0.028***
	(6.12)	(5.09)	(3.80)	(2.94)	(1.91)	(5.50)	(4.55)
DACC* High Firm Specific Return Variation	-0.006***	-0.002	-0.003*	-0.002	-0.003	-0.003**	-0.011***
	(3.39)	(1.56)	(1.68)	(0.61)	(0.89)	(2.06)	(3.53)
Total Assets (log)	-0.004***	-0.004***	-0.003***	-0.004***	-0.002**	-0.004***	-0.003**
	(5.45)	(9.01)	(5.50)	(4.84)	(2.27)	(8.95)	(2.53)
BTM (lag)	0.015***	0.014***	0.017***	0.015***	0.021***	0.015***	0.014***
	(11.79)	(10.89)	(9.52)	(6.92)	(5.90)	(12.11)	(5.29)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	181661	90753	59766	26019	8914	130892	50769
R-squared	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Panel B. DACC and Firm Specific Return Variation-Alternative CAR Windows.

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
CAR [0,1]							
DACC* High Firm							
Specific Return Variation	-0.002***	-0.001	-0.002	-0.000	-0.002	-0.001	-0.005***
	(2.88)	(0.87)	(1.62)	(0.29)	(0.83)	(1.55)	(3.05)
CAR [0,3]							
DACC* High Firm							
Specific Return Variation	-0.004***	-0.002*	-0.003**	-0.002	-0.003	-0.002**	-0.008***
	(3.25)	(1.65)	(1.99)	(0.83)	(0.97)	(2.20)	(3.12)
CAR [0,10]							
DACC* High Firm							
Specific Return Variation	-0.009***	-0.005**	-0.005*	-0.003	-0.005	-0.005**	-0.017***
	(3.91)	(2.20)	(1.72)	(0.81)	(0.96)	(2.50)	(3.83)
CAR [0,20]							
DACC* High Firm							
Specific Return Variation	-0.013***	-0.007**	-0.007	-0.004	-0.006	-0.007**	-0.020***
	(3.51)	(2.09)	(1.62)	(0.60)	(0.75)	(2.41)	(2.86)
CAR [0,60]							
DACC* High Firm							
Specific Return Variation	-0.021***	-0.023***	-0.020**	-0.021	-0.007	-0.019***	-0.017
	(2.82)	(3.19)	(2.06)	(1.46)	(0.49)	(2.88)	(1.06)
CAR [0,120]							
DACC* High Firm							
Specific Return Variation	-0.025*	-0.025**	-0.028*	-0.023	-0.022	-0.023**	-0.019
	(1.77)	(2.07)	(1.79)	(1.02)	(0.86)	(2.08)	(0.60)

Panel C. Real Earnings Management and Firm Specific Return Variation-Main Regression.

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
RM (log)	0.006***	0.003***	0.002	0.002	0.002	0.003***	0.009***
	(2.95)	(2.93)	(1.15)	(0.84)	(0.95)	(2.73)	(4.54)
High Firm Specific Return Variation	-0.015***	-0.014***	-0.010***	-0.012***	-0.008	-0.013***	-0.018***
	(6.51)	(6.67)	(3.75)	(3.25)	(1.63)	(6.72)	(4.91)
RM* High Firm Specific Return Variation	-0.006***	-0.004***	-0.001	-0.002	0.002	-0.003**	-0.011***
	(2.93)	(2.68)	(0.29)	(0.67)	(0.71)	(2.02)	(4.33)
Total Assets (log)	-0.003***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.002**
	(7.90)	(10.83)	(7.01)	(5.13)	(3.51)	(11.14)	(2.08)
BTM (lag)	0.014***	0.014***	0.015***	0.015***	0.020***	0.015***	0.013***
	(11.49)	(10.65)	(8.56)	(6.17)	(5.51)	(11.45)	(4.92)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	178966	91542	60628	26469	8684	133029	45937
R-squared	0.01	0.02	0.02	0.02	0.02	0.02	0.02

Panel D. RM and Firm Specific Return Variation- Alternative CAR Windows.

	All	Board	Officer	Top Mng	Top Fin	Non-Benown	Benown
CAR [0,1]							
RM*High Firm Specific Return Variation	-0.002**	-0.001	0.000	-0.000	0.000	-0.001	-0.005***
	(2.23)	(1.56)	(0.25)	(0.32)	(0.25)	(1.23)	(3.40)
CAR [0,3]							
RM*High Firm Specific Return Variation	-0.004**	-0.002*	0.000	-0.001	0.003	-0.002	-0.009***
	(2.46)	(1.91)	(0.01)	(0.55)	(1.12)	(1.45)	(4.03)
CAR [0,10]							
RM*High Firm Specific Return Variation	-0.009***	-0.007***	-0.003	-0.005	0.004	-0.005**	-0.015***
	(3.34)	(3.30)	(1.03)	(1.21)	(0.80)	(2.52)	(3.94)
CAR [0,20]							
RM*High Firm Specific Return Variation	-0.014***	-0.011***	-0.005	-0.009	0.005	-0.008***	-0.025***
	(4.03)	(3.80)	(1.30)	(1.55)	(0.70)	(2.79)	(3.83)
CAR [0,60]							
RM*High Firm Specific Return Variation	-0.027***	-0.019***	-0.015**	-0.013	-0.010	-0.018***	-0.043***
	(4.37)	(3.28)	(2.01)	(1.21)	(0.77)	(3.34)	(3.01)
CAR [0,120]							
RM*High Firm Specific Return Variation	-0.045***	-0.022**	-0.025**	-0.016	-0.016	-0.026***	-0.080***
	(4.01)	(2.19)	(2.07)	(0.84)	(0.80)	(2.75)	(3.50)

Table 3.8 Firm-Year Level Regression Results

Table reports firm-year level regression results of stock market reactions on DACC (in Panel A), Real Earnings Management (in Panel B) and firm specific return variation (in Panel C) controlling for size and book to market ratio. For each regression, we use the annual average cumulative abnormal returns for all insider buys in a given firm as our dependent variable. Abnormal returns are estimated using the market model. DACC is the log of the moving sum of absolute accruals over the past three years. Real earnings management is the log of the moving sum of absolute discretionary SG&A over the past three years. Firm specific return variation is the log transformation of the moving sum of the R^2 over the past three years, calculated as log $((1- R^2)/ R^2)$. We use the log of one year lagged total asset to control for size. Book to market ratio is the book equity value divided by market equity value at last year's fiscal year end. t-statistics are in the parenthesis. All models include year dummies. Standard errors are clustered by firm. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

Panel A. DACC

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
DACC(log)	0.001***	0.002***	0.003***	0.005***	0.007***	0.011***	0.022***
	(3.80)	(4.67)	(5.44)	(6.72)	(6.28)	(5.79)	(5.96)
Assets (log)	-0.002***	-0.002***	-0.002***	-0.003***	-0.004***	-0.006***	-0.007***
	(10.42)	(9.74)	(8.05)	(8.92)	(8.47)	(6.55)	(4.01)
Book to Market	0.005***	0.009***	0.012***	0.016***	0.030***	0.078***	0.147***
	(8.24)	(10.36)	(11.30)	(11.40)	(15.01)	(20.78)	(20.98)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	29323	29323	29319	29319	29319	29319	29319
R-squared	0.01	0.02	0.02	0.02	0.02	0.03	0.03

Panel B. Real Earning Management.

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
RM(log)	0.001**	0.001*	0.001**	0.001*	0.003***	0.008***	0.017***
	(2.07)	(1.79)	(2.28)	(1.78)	(2.74)	(4.44)	(5.34)
Assets (log)	-0.002***	-0.002***	-0.003***	-0.004***	-0.005***	-0.006***	-0.009***
	(12.07)	(11.44)	(10.18)	(11.22)	(10.33)	(8.03)	(5.49)
Book to Market	0.005***	0.009***	0.011***	0.016***	0.030***	0.077***	0.146***
	(8.06)	(10.26)	(10.47)	(10.85)	(14.47)	(19.89)	(20.48)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	29512	29512	29509	29509	29509	29509	29509
R-squared	0.01	0.02	0.02	0.02	0.02	0.03	0.03

Panel C. Firm Specific Return Variation.

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
Firm Specific Return Variation	-0.001***	-0.002***	-0.003***	-0.004***	-0.007***	-0.015***	-0.028***
	(4.08)	(7.26)	(7.53)	(8.40)	(9.89)	(12.69)	(10.90)
Assets (log)	-0.002***	-0.004***	-0.004***	-0.006***	-0.008***	-0.014***	-0.025***
	(13.33)	(15.68)	(14.73)	(16.28)	(16.78)	(16.28)	(14.10)
Book to Market	0.005***	0.009***	0.012***	0.017***	0.032***	0.083***	0.154***
	(8.55)	(11.26)	(11.99)	(12.62)	(16.63)	(23.34)	(22.73)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34265	34265	34261	34261	34261	34261	34261
R-squared	0.01	0.02	0.02	0.02	0.02	0.04	0.03

Table 3.9 Alternative Specifications for Main Variables

Regression of stock market reaction on DACC, real earnings management and firm specific return variation controlling for size and book to market ratio. In Panel A, we use one year opacity measure (logged) instead of three year measures. In Panel B, we use three year level of opacity instead of three year logged measure. Abnormal returns are estimated using the market model. DACC is the moving sum of absolute accruals over the past three years. Real earnings management is the log of the moving sum of absolute discretionary SG&A over the past three years. Firm specific return variation is the log transformation of the R^2 in year t-1, calculated as log ((1- R^2)/ R^2) (in Panel A), and R^2 (in Panel B). R^2 is calculated every year by regressing the daily return on market return. We use the log of one year lagged total asset to control for size. Book to market ratio is the book equity value divided by market equity value at last year's fiscal year end. t-statistics are in the parenthesis. All models include year dummies. Standard errors are clustered by firm. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

Panel A. One Year Lag.

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
DACC (log)	0.000*	0.001**	0.001**	0.001*	0.002*	0.006**	0.010**
	(1.80)	(2.47)	(2.38)	(1.68)	(1.94)	(2.55)	(2.32)
At (log)	-0.002***	-0.003***	-0.003***	-0.004***	-0.005***	-0.009***	-0.017***
	(7.31)	(5.46)	(4.92)	(5.17)	(5.34)	(5.58)	(6.32)
BTM	0.006***	0.010***	0.013***	0.019***	0.030***	0.079***	0.142***
	(11.77)	(11.85)	(11.75)	(11.05)	(11.49)	(14.00)	(14.67)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	247162	247140	247113	247113	247113	247113	247113
R-squared	0.01	0.01	0.01	0.01	0.01	0.03	0.03

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
RM (log)	0.001**	0.001**	0.001*	0.001	0.002*	0.004*	0.006
	(2.46)	(2.08)	(1.65)	(0.75)	(1.66)	(1.87)	(1.62)
At (log)	-0.002***	-0.002***	-0.003***	-0.004***	-0.005***	-0.009***	-0.017***
	(8.06)	(5.92)	(5.23)	(5.64)	(5.71)	(5.89)	(6.75)
BTM	0.006***	0.010***	0.013***	0.018***	0.029***	0.075***	0.137***
	(11.38)	(11.72)	(11.53)	(10.52)	(11.06)	(13.19)	(13.93)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	234697	234678	234663	234663	234663	234663	234663
R-squared	0.01	0.01	0.01	0.01	0.01	0.03	0.03

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
Firm Specific Return Variation	-0.000***	-0.001***	-0.001***	-0.002***	-0.004***	-0.008***	-0.013***
	(2.79)	(3.56)	(3.58)	(4.88)	(5.53)	(5.58)	(5.18)
At (log)	-0.002***	-0.003***	-0.003***	-0.005***	-0.007***	-0.014***	-0.025***
	(9.38)	(7.81)	(7.32)	(7.90)	(8.48)	(9.16)	(9.55)
BTM	0.006***	0.011***	0.013***	0.020***	0.032***	0.082***	0.148***
	(12.53)	(12.66)	(12.59)	(12.19)	(12.68)	(14.85)	(15.72)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	261589	261566	261537	261537	261537	261537	261537
R-squared	0.01	0.01	0.01	0.01	0.02	0.03	0.03

Panel B. Three Year Level.

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
DACC	0.003*	0.005*	0.007*	0.012**	0.019**	0.039**	0.073**
	(1.86)	(1.70)	(1.82)	(2.15)	(2.16)	(2.22)	(2.08)
At (log)	-0.002***	-0.002***	-0.002***	-0.003***	-0.004***	-0.005***	-0.011***
	(5.84)	(4.19)	(3.53)	(3.46)	(3.35)	(2.82)	(3.40)
BTM	0.007***	0.011***	0.014***	0.020***	0.032***	0.083***	0.149***
	(11.24)	(11.11)	(10.95)	(10.39)	(10.74)	(12.79)	(13.74)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	193019	193004	192971	192971	192971	192971	192971
R-squared	0.01	0.01	0.01	0.01	0.02	0.03	0.04

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
RM	0.002***	0.002*	0.003**	0.003*	0.006**	0.018***	0.032***
	(2.58)	(1.88)	(2.05)	(1.95)	(2.51)	(3.59)	(3.44)
At (log)	-0.002***	-0.002***	-0.002***	-0.003***	-0.004***	-0.005***	-0.010***
	(7.06)	(5.01)	(4.32)	(4.38)	(3.99)	(3.16)	(3.75)
BTM	0.007***	0.011***	0.013***	0.019***	0.032***	0.080***	0.147***
	(10.88)	(10.90)	(10.57)	(10.04)	(10.82)	(12.99)	(14.08)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	190969	190951	190941	190941	190941	190941	190941
R-squared	0.01	0.01	0.01	0.01	0.02	0.03	0.04

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
R-squared	0.005*	0.010**	0.014***	0.027***	0.041***	0.107***	0.192***
	(1.96)	(2.32)	(2.68)	(3.79)	(3.81)	(5.41)	(7.06)
At (log)	-0.002***	-0.003***	-0.004***	-0.005***	-0.007***	-0.014***	-0.026***
	(10.29)	(9.50)	(9.06)	(9.46)	(9.03)	(8.95)	(8.88)
BTM	0.006***	0.011***	0.013***	0.020***	0.033***	0.082***	0.149***
	(11.73)	(11.89)	(11.77)	(11.67)	(11.91)	(14.25)	(15.67)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	222752	222731	222709	222709	222709	222709	222709
R-squared	0.01	0.01	0.01	0.01	0.02	0.03	0.04

Table 3.10 Additional Controls Variables

Regression of stock market reaction on DACC, real earnings management and firm specific return variation controlling for size, book to market ratio, turnover (trading volume/common shares outstanding) and illiquidity. DACC is the moving sum of absolute accruals over the past three years. Real earnings management is the log of the moving sum of absolute discretionary SG&A over the past three years. Firm specific return variation is the log transformation of the R^2 in year t-1, calculated as log ((1- R^2)/ R^2). We use the log of one year lagged total asset to control for size. Book to market ratio is the book equity value divided by market equity value at last year's fiscal year end. Illiquidity is calculated as abs(ret)/(abs(prc)*vol*1,000,000). t-statistics are in the parenthesis. All models include year dummies. Standard errors are clustered by firm. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

Panel A. DACC

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
DACC (log)	0.002***	0.002***	0.003***	0.005***	0.007***	0.014***	0.023***
	(3.78)	(3.39)	(3.43)	(3.55)	(3.21)	(3.27)	(2.98)
Assets (log)	-0.001***	-0.002***	-0.002***	-0.002***	-0.004***	-0.007***	-0.015***
	(4.40)	(3.18)	(2.74)	(3.01)	(3.28)	(3.31)	(4.38)
Book to Market	0.007***	0.011***	0.014***	0.021***	0.034***	0.087***	0.159***
	(10.54)	(10.63)	(10.60)	(10.49)	(11.09)	(13.23)	(14.31)
Volume Scale	0.689***	1.132***	1.267***	1.635***	2.144***	2.343***	3.368***
	(7.12)	(7.58)	(7.39)	(6.63)	(6.82)	(4.55)	(3.97)
Illiquidity	0.000	-0.000	-0.001	-0.003***	-0.006***	-0.014***	-0.030***
	(0.71)	(0.49)	(1.36)	(3.25)	(4.22)	(4.66)	(5.08)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	192213	192199	192165	192165	192165	192165	192165
R-squared	0.01	0.01	0.01	0.02	0.02	0.03	0.04

Panel B. Real Earnings Management.

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
RM (log)	0.002***	0.002**	0.003**	0.003**	0.005***	0.013***	0.023***
	(2.87)	(2.36)	(2.43)	(2.21)	(2.86)	(4.01)	(4.09)
Assets (log)	-0.002***	-0.002***	-0.002***	-0.003***	-0.004***	-0.007***	-0.014***
	(6.78)	(4.69)	(4.35)	(4.70)	(4.75)	(4.26)	(5.51)
Book to Market	0.007***	0.011***	0.014***	0.020***	0.034***	0.085***	0.157***
	(10.25)	(10.48)	(10.47)	(10.27)	(11.41)	(13.46)	(14.58)
Volume Scale	0.649***	1.05***	1.18***	1.43***	1.95***	2.11***	3.33***
	(7.35)	(8.48)	(8.24)	(7.34)	(6.98)	(4.46)	(4.37)
Illiquidity	0.000	-0.000	-0.001*	-0.003***	-0.006***	-0.014***	-0.029***
	(0.55)	(0.29)	(1.90)	(3.36)	(4.76)	(4.76)	(5.19)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	190104	190086	190076	190076	190076	190076	190076
R-squared	0.01	0.01	0.01	0.01	0.02	0.03	0.04

Panel C. Firm Specific Return Variation.

	CAR [0,1]	CAR [0,3]	CAR [0,5]	CAR [0,10]	CAR [0,20]	CAR [0,60]	CAR [0,120]
Firm Specific Return Variation	-0.001***	-0.003***	-0.003***	-0.006***	-0.008***	-0.021***	-0.036***
	(3.96)	(4.90)	(5.06)	(6.03)	(5.99)	(7.49)	(8.36)
Assets (log)	-0.002***	-0.003***	-0.004***	-0.005***	-0.008***	-0.017***	-0.032***
	(8.61)	(7.89)	(7.77)	(8.62)	(9.06)	(9.65)	(9.80)
Book to Market	0.006***	0.011***	0.014***	0.021***	0.036***	0.089***	0.163***
	(11.53)	(12.12)	(12.17)	(12.28)	(12.92)	(15.21)	(16.63)
Volume Scale	0.634***	1.02***	1.14***	1.43***	1.81***	1.85***	2.73***
	(7.50)	(7.99)	(7.81)	(6.81)	(6.68)	(4.11)	(3.66)
Illiquidity	0.001*	0.001	0.000	-0.001	-0.003**	-0.007**	-0.020***
	(1.70)	(1.31)	(0.41)	(0.75)	(2.29)	(2.47)	(3.61)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	218394	218374	218351	218351	218351	218351	218351
R-squared	0.01	0.01	0.01	0.02	0.02	0.03	0.04

Table 4.1 Summary Statistics

Panel A. Cover Firms versus Compustat Firms (industry median and year adjusted)

	Industry Median Adjusted		
	n	Mean	t
Total assets (1)	444	35875***	12.28
Tobin's Q (1)	444	2.117***	6.66
Asset growth (1)	444	0.153***	9.84

Panel B: Summary Statistics and Correlation Matrix

		n	Mean	Stdev	1	2	3	4	5	6	7	8	9	10	11	12
1	N Employees (000)	435	89.774	163.751	1											
2	Ivy league	444	0.331	0.456	-0.037	1										
3	Master & above	444	0.548	0.548	0.011	0.065	1									
4	Mgmt degree	444	0.291	0.455	0.183	0.132	0.399	1								
5	Executive age	444	53.4	9.3	0.184	-0.059	0.12	-0.024	1							
6	Female	444	0.061	0.23	-0.058	0.043	0.056	0.110	-0.159	1						
7	Founder	444	0.348	0.477	-0.273	0.052	-0.205	-0.197	-0.289	0.028	1					
8	Q (7 yr avg)	374	2.931	3.093	-0.188	0.062	-0.094	-0.078	-0.342	0.105	0.274	1				
9	Q (5 yr avg)	391	3.251	4.106	-0.18	0.044	-0.047	-0.083	-0.334	0.128	0.233	0.955	1			
10	Q (3 yr avg)	415	3.323	4.609	-0.164	0.015	-0.005	-0.087	-0.298	0.052	0.2	0.859	0.901	1		
11	Δ Q (t_3-t_{-1})	406	-0.42	1.346	0.044	0.085	0.004	-0.063	0.172	-0.048	-0.164	-0.208	-0.227	-0.311	1	
12	Δ Q (t_2-t_{-1})	411	-0.397	1.349	0.038	0.071	0.003	-0.038	0.152	-0.062	-0.136	-0.188	-0.215	-0.274	0.88	1
13	Δ Q (t_1-t_{-1})	415	-0.336	1.167	0.059	0.077	0.039	-0.032	0.133	-0.09	-0.107	-0.142	-0.117	-0.12	0.752	0.796

Table 4.2 Ivy Impact on Firm Market Valuation and Change in Valuation

Panel A. Ivy League Education and Valuation Level

	Tobin's $Q_{3=}$ 3 year post and prior (7 year average)	Tobin's $Q_{2=}$ 2 year post and prior (5 year average)	Tobin's $Q_{1=}$ 1 year post and prior (3 year average)
Ivy League School	0.456*	0.402*	0.445*
	(0.237)	(0.229)	(0.238)
Management Degree	-0.313*	-0.320*	-0.351*
	(0.182)	(0.178)	(0.183)
Female	-0.332	-0.165	-0.027
	(0.365)	(0.384)	(0.388)
Executive Age	-0.019	-0.023*	-0.021
	(0.013)	(0.013)	(0.013)
Founder	0.456*	0.422*	0.413
	(0.262)	(0.253)	(0.254)
N Employees (log)	-0.166**	-0.164**	-0.130*
	(0.073)	(0.071)	(0.073)
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Observations	367	384	406
R-squared	0.66	0.67	0.64

For all tables, standard errors are in brackets, and *, **, and *** represent statistical significance levels at 0.10, 0.05 and 0.01, respectively under a two-tailed test.

Panel B. Ivy League Education and Valuation Sustainability.

	Δ Q (t_3-t_{-1}) 3 year post-prior	Δ Q (t_2-t_{-1}) 2 year post-prior	Δ Q (t_1-t_{-1}) 1 year post-prior
Ivy League School	0.393**	0.400**	0.382***
	(0.163)	(0.171)	(0.145)
Management Degree	-0.406***	-0.371**	-0.290**
	(0.153)	(0.152)	(0.127)
Female	-0.059	0.016	-0.008
	(0.294)	(0.311)	(0.258)
Executive Age	-0.004	-0.007	-0.006
	(0.010)	(0.009)	(0.008)
Founder	0.057	0.163	0.239
	(0.164)	(0.181)	(0.155)
N Employees (log)	-0.036	-0.040	0.021
	(0.057)	(0.060)	(0.054)
Q_{t-1}	-0.502***	-0.523***	-0.388***
	(0.057)	(0.063)	(0.047)
Year Dummy	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes
Observations	397	403	406
R-squared	0.55	0.52	0.50

Table 4.3 Ivy and Education

Panel A. Valuation Level

	Master & Above			Bachelor & Below		
	Q_3	Q_2	Q_1	Q_3	Q_2	Q_1
Ivy League School	-0.005	-0.074	-0.051	1.041**	0.928**	0.953**
	(0.174)	(0.179)	(0.200)	(0.411)	(0.428)	(0.461)
Management Degree	-0.181	-0.166	-0.288	-0.810**	-0.869**	-0.785**
	(0.201)	(0.201)	(0.227)	(0.369)	(0.354)	(0.353)
Female	0.383	0.456	0.608	-0.672	-0.641	-0.326
	(0.852)	(0.776)	(0.875)	(0.671)	(0.628)	(0.509)
Executive Age	0.007	0.008	0.006	-0.036	-0.043**	-0.037*
	(0.012)	(0.013)	(0.014)	(0.023)	(0.021)	(0.020)
Founder	-0.112	-0.040	-0.091	0.805*	0.673*	0.652*
	(0.299)	(0.286)	(0.302)	(0.425)	(0.403)	(0.391)
N Employees (log)	-0.291***	-0.253***	-0.233**	-0.061	-0.087	-0.056
	(0.098)	(0.089)	(0.105)	(0.135)	(0.127)	(0.114)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	189	196	203	178	188	203
R-squared	0.74	0.77	0.73	0.75	0.74	0.71

Panel B. Valuation Sustainability

	Master & Above			Bachelor & Below		
	ΔQ $(t_3\text{-}t_{-1})$	ΔQ $(t_2\text{-}t_{-1})$	ΔQ $(t_1\text{-}t_{-1})$	ΔQ $(t_3\text{-}t_{-1})$	ΔQ $(t_2\text{-}t_{-1})$	ΔQ $(t_1\text{-}t_{-1})$
Ivy League School	0.039	0.066	0.082	0.709*	0.628*	0.732**
	(0.159)	(0.173)	(0.157)	(0.361)	(0.350)	(0.341)
Management Degree	-0.320	-0.220	-0.218	0.086	-0.031	-0.118
	(0.217)	(0.218)	(0.173)	(0.323)	(0.315)	(0.309)
Female	0.765	0.808	0.495	-0.632	-0.459	-0.081
	(0.487)	(0.621)	(0.492)	(0.600)	(0.730)	(0.620)
Executive Age	0.013	0.009	0.010	-0.009	-0.009	-0.005
	(0.013)	(0.013)	(0.013)	(0.018)	(0.016)	(0.017)
Founder	-0.372	-0.211	-0.147	0.118	0.130	0.493*
	(0.286)	(0.337)	(0.245)	(0.344)	(0.368)	(0.297)
N Employees (log)	-0.066	-0.138*	-0.027	-0.090	-0.073	0.014
	(0.070)	(0.071)	(0.082)	(0.120)	(0.117)	(0.104)
Q_{t-1}	-0.611***	-0.684***	-0.493***	-0.448***	-0.437***	-0.365***
	(0.076)	(0.078)	(0.058)	(0.092)	(0.101)	(0.088)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	201	203	203	196	200	203
R-squared	0.68	0.69	0.66	0.62	0.51	0.52

Table 4.4 Ivy and Executive Age

Panel A. Valuation Level

	Age<55			Age>=55		
	Q_3	Q_2	Q_1	Q_3	Q_2	Q_1
Ivy League School	0.675**	0.512*	0.501	0.268	0.292	0.310
	(0.310)	(0.307)	(0.305)	(0.292)	(0.295)	(0.296)
Management Degree	-0.123	-0.096	-0.180	-0.515**	-0.549**	-0.533**
	(0.275)	(0.264)	(0.304)	(0.240)	(0.246)	(0.229)
Female	-0.365	-0.239	-0.045			-1.040
	(0.369)	(0.372)	(0.416)			(0.829)
Executive Age	-0.022	-0.020	-0.022	-0.012	-0.021	-0.018
	(0.026)	(0.026)	(0.028)	(0.027)	(0.024)	(0.025)
Founder	0.715*	0.727**	0.833**	-0.120	-0.157	-0.184
	(0.362)	(0.325)	(0.370)	(0.301)	(0.297)	(0.291)
N Employees (log)	-0.088	-0.070	-0.016	-0.193*	-0.218**	-0.234**
	(0.119)	(0.098)	(0.103)	(0.101)	(0.099)	(0.095)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	184	197	216	183	187	190
R-squared	0.74	0.75	0.70	0.69	0.68	0.69

Panel B. Valuation Sustainability

	Age<55			Age>=55		
	ΔQ $(t_3\text{-}t_{-1})$	ΔQ $(t_2\text{-}t_{-1})$	ΔQ $(t_1\text{-}t_{-1})$	ΔQ $(t_3\text{-}t_{-1})$	ΔQ $(t_2\text{-}t_{-1})$	ΔQ $(t_1\text{-}t_{-1})$
Ivy League School	0.615**	0.767***	0.644***	0.158	-0.039	0.086
	(0.252)	(0.264)	(0.246)	(0.159)	(0.179)	(0.174)
Management Degree	-0.531**	-0.421*	-0.465**	-0.472***	-0.348*	-0.144
	(0.246)	(0.248)	(0.204)	(0.176)	(0.177)	(0.180)
Female	0.072	0.156	0.186	2.329***	-2.045***	-1.110**
	(0.373)	(0.362)	(0.335)	(0.619)	(0.547)	(0.470)
Executive Age	-0.022	-0.007	-0.000	-0.043**	-0.041**	-0.014
	(0.029)	(0.028)	(0.025)	(0.020)	(0.017)	(0.018)
Founder	-0.121	0.270	0.482*	0.227	0.198	0.097
	(0.314)	(0.363)	(0.261)	(0.198)	(0.203)	(0.197)
N Employees (log)	-0.044	-0.060	0.001	0.037	0.008	0.059
	(0.094)	(0.097)	(0.082)	(0.067)	(0.082)	(0.102)
Q_{t-1}	-0.518***	-0.595***	-0.453***	-0.401***	-0.302***	-0.257***
	(0.077)	(0.096)	(0.061)	(0.068)	(0.093)	(0.076)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	209	212	216	188	191	190
R-squared	0.63	0.61	0.56	0.72	0.65	0.63

Table 4.5 Ivy and Firm Size

Panel A. Valuation Level.

	Small Firm (Num Employees Below Median)			Big Firm (Num Employees Above Median)		
	Q_3	Q_2	Q_1	Q_3	Q_2	Q_1
Ivy League School	1.317***	1.091***	1.028***	-0.109	-0.102	-0.103
	(0.347)	(0.373)	(0.335)	(0.210)	(0.213)	(0.219)
Management Degree	-0.266	-0.235	-0.170	-0.246	-0.251	-0.214
	(0.336)	(0.282)	(0.293)	(0.185)	(0.188)	(0.195)
Female	-0.541	-0.084	0.352	-0.701	-0.738	-0.663
	(0.555)	(0.550)	(0.489)	(0.480)	(0.474)	(0.483)
Executive Age	-0.024	-0.029	-0.031*	-0.023*	-0.023	-0.023
	(0.023)	(0.021)	(0.018)	(0.014)	(0.014)	(0.014)
Founder	0.428	0.318	0.213	0.203	0.232	0.417
	(0.437)	(0.348)	(0.327)	(0.349)	(0.354)	(0.377)
N Employees (log)	-0.033	-0.018	0.017	-0.456***	-0.451***	-0.448***
	(0.148)	(0.129)	(0.117)	(0.152)	(0.153)	(0.159)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	156	173	192	211	211	214
R-squared	0.78	0.75	0.72	0.71	0.71	0.71

Panel B. Valuation Sustainability

	Small Firm (Num Employees Below Median)			Big Firm (Num Employees Above Median)		
	Δ Q (t_3-t_{-1})	Δ Q (t_2-t_{-1})	Δ Q (t_1-t_{-1})	Δ Q (t_3-t_{-1})	Δ Q (t_2-t_{-1})	Δ Q (t_1-t_{-1})
Ivy League School	0.713**	0.731**	0.552*	0.023	-0.045	0.152
	(0.284)	(0.291)	(0.283)	(0.159)	(0.151)	(0.142)
Management Degree	-0.680**	-0.625*	-0.343	-0.192	-0.258*	-0.242
	(0.331)	(0.354)	(0.260)	(0.163)	(0.152)	(0.150)
Female	-0.476	-0.130	0.095	0.245	0.283	-0.153
	(0.465)	(0.516)	(0.324)	(0.404)	(0.411)	(0.429)
Executive Age	-0.025*	-0.030**	-0.020	0.009	0.012	0.002
	(0.013)	(0.014)	(0.013)	(0.011)	(0.012)	(0.011)
Founder	-0.142	-0.004	0.194	-0.161	-0.165	-0.006
	(0.235)	(0.287)	(0.226)	(0.277)	(0.266)	(0.287)
N Employees (log)	0.173	0.175	0.242**	-0.300**	-0.270***	-0.187*
	(0.106)	(0.110)	(0.099)	(0.116)	(0.100)	(0.103)
Q_{t-1}	-0.398***	-0.464***	-0.353***	-0.576***	-0.500***	-0.426***
	(0.082)	(0.089)	(0.086)	(0.077)	(0.079)	(0.072)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	184	190	192	213	213	214
R-squared	0.65	0.58	0.57	0.73	0.70	0.64

Table 4.6 Era of Graduation

Panel A. Valuation Level.

	Early Years (Graduation Year<1960)			Later Years (Graduation Year>=1960)		
	Q_3	Q_2	Q_1	Q_3	Q_2	Q_1
Ivy League School	0.453	0.508	0.526	0.827**	0.720**	0.721**
	(0.322)	(0.319)	(0.328)	(0.331)	(0.332)	(0.339)
Management Degree	-0.419**	-0.480**	-0.485**	-0.310	-0.231	-0.331
	(0.203)	(0.196)	(0.200)	(0.324)	(0.309)	(0.319)
Female				-0.584	-0.468	-0.188
				(0.387)	(0.389)	(0.392)
Executive Age	0.008	-0.009	-0.010	-0.029	-0.027	-0.026
	(0.021)	(0.019)	(0.020)	(0.024)	(0.026)	(0.025)
Founder	0.018	-0.046	-0.027	0.353	0.483	0.500
	(0.289)	(0.275)	(0.286)	(0.371)	(0.363)	(0.361)
N Employees (log)	0.006	-0.029	-0.045	-0.283**	-0.238**	-0.163
	(0.079)	(0.081)	(0.084)	(0.109)	(0.102)	(0.103)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	180	184	186	188	201	221
R-squared	0.67	0.64	0.65	0.68	0.68	0.63

Panel B. Valuation Sustainability

	Early Years (Graduation Year<1960)			Later Years (Graduation Year>=1960)		
	ΔQ (t_3-t_{-1})	ΔQ (t_2-t_{-1})	ΔQ (t_1-t_{-1})	ΔQ (t_3-t_{-1})	ΔQ (t_2-t_{-1})	ΔQ (t_1-t_{-1})
Ivy League School	0.270	0.224	0.255	0.474*	0.566**	0.633***
	(0.165)	(0.170)	(0.183)	(0.261)	(0.282)	(0.229)
Management Degree	-0.479**	-0.280*	-0.243	-0.414	-0.410	-0.322
	(0.201)	(0.169)	(0.174)	(0.257)	(0.272)	(0.208)
Female				-0.043	0.071	-0.056
				(0.331)	(0.329)	(0.293)
Executive Age	-0.003	-0.011	-0.000	-0.006	0.000	0.002
	(0.016)	(0.015)	(0.014)	(0.019)	(0.022)	(0.018)
Founder	-0.035	-0.210	-0.108	0.137	0.343	0.456*
	(0.269)	(0.231)	(0.258)	(0.283)	(0.328)	(0.236)
N Employees (log)	0.039	0.011	0.083	-0.077	-0.089	-0.035
	(0.084)	(0.084)	(0.114)	(0.086)	(0.091)	(0.074)
Q_{t-1}	-0.395***	-0.396***	-0.313***	-0.538***	-0.582***	-0.454***
	(0.075)	(0.082)	(0.089)	(0.077)	(0.086)	(0.057)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	183	187	186	215	217	221
R-squared	0.68	0.60	0.64	0.58	0.55	0.51

Appendix

Appendix A1. Sample Breakdown by Data Sources

	Compustat 500 List		Corporate Library Additions	
Year	# Firms	# of Moves	# Firms	# of Moves
1971	506	-		
1972	526	6		
1973	543	4		
1974	559	8		
1975	575	5		
1976	599	5		
1977	618	1		
1978	628	3		
1979	627	3		
1980	610	1		
1981	586	6		
1982	572	5		
1983	559	1		
1984	536	1		
1985	506	4		
1986	489	6		
1987	470	4		
1988	447	3		
1989	438	3		
1990	440	3		
1991	450	3		
1992	465	6		
1993	481	8		
1994	485	2		
1995	489	4		
1996	495	3		
1997	496	5		
1998	479	8		
1999	468	8		
2000	454	1		
2001	446	2	565	-
2002	449	4	741	2
2003	463	8	793	6
2004	475	4	946	12
2005	461	1	1,006	9
2006	468	5	1,538	5
2007	451	0	1,636	19
2008	446	2	1,601	23
Total	19,255	146	8,826	76

Appendix A2. Location Data Construction and Data Sources

Variable	Definition	Data Range	Source
Population	MSA population	1970-2011	Bureau of Economic Analysis
Total employment	MSA total employment	1970-2011	Bureau of Economic Analysis
Per capita income	MSA per capita income	1970-2011	Bureau of Economic Analysis
Private business	MSA number of private non-farm establishment	1980-2009	Census
Corporate tax rate	State level top marginal rate	1970-2011	Tax Foundation & U Michigan World Tax
Personal tax (top marginal)	State level top marginal personal income tax rate	1970-2011	Tax Foundation & U Michigan World Tax
Personal tax (burden)	State level personal tax burden rate; calculated by Tax Foundation as the total amount paid by the residents in taxes, then divide those taxes by the state's total income.	1977-2010	Tax Foundation
Personal tax (capital gains)	State level top capital gains rate; calculated by NBER Taxism program.	1977-2011	NBER Taxism
Natural amenities	MSA scale measure combining warm winter, winter sun, temperate summer, low summer humidity, topographic variation, and water area; Higher--better natural living condition	Mean of 1941-1970	Department of Agriculture
Wage	MSA average wage	1970-2011	US Bureau of Economic Analysis
Service employment%	MSA service industry employee/total employee	1970-2011	US Bureau of Economic Analysis
Finance employment%	MSA finance industry employee/total employee	1970-2011	US Bureau of Economic Analysis
Crime rate	MSA level number of violent crimes known to police scaled by population	1980-2011	Department of Justice-FBI

Appendix A3. Matching Quality

Table reports quality of matching for match firms used in Table 2.3 to Table 2.5. Panel A reports firm level matching regression results and matching quality (correspond to Table 2.3 and 2.4); and Panel B reports location level matching results and matching quality (correspond to Table 2.5). t scores are in brackets. *, **, *** corresponds to significance at 10%, 5%, and 1% respectively.

Panel A. Firm Level Matches

Logit Model	Assets (log)	Q	ROA	Age (log)	Pseudo R2
Move	-0.002	-0.138	-3.477***	0.133	0.0527
	(-0.03)	(-1.38)	(-6.05)	(1.27)	

Match by closest scores and:

	Industry/year				Industry/year/move out location			
	Move firm	Match firm	Dif	t	Move firm	Match firm	Dif	t
Size (at)	3947	3252	695	(1.38)	4888	4190	699	(0.77)
Q	1.51	1.46	0.055	(1.19)	1.46	1.47	-0.016	(-0.20)
TFP growth	0.045	0.051	-0.006	(-0.67)	0.046	0.040	0.006	(0.48)
ROA	0.017	0.023	-0.006	(-1.18)	0.007	0.038	-0.031***	(-3.02)
SG&A/revt	0.175	0.174	0.001	(0.15)	0.184	0.212	-0.028	(-1.61)
Corporate Tax	0.127	0.110	0.017	(1.05)	0.124	0.161	-0.037	(-1.59)
Employee (log)	2.282	2.227	0.056	(0.39)	2.40	2.38	0.021	(0.10)
Credit rating	11.0	11.0	0.027	(0.05)	10.6	10.6	0.041	(0.04)
Leverage	0.283	0.250	0.033	(1.14)	0.287	0.236	0.052	(1.21)

Panel B. Location Level Matches

Match models for MSAs that have net move ins:

Logit	Pop (log)	Wage (log)	Finance	Service	Ind Tax	Corp Tax	Num HQ (log)	Pseudo R2
Move in	-0.063	0.228	7.117*	-0.229	-0.061**	-0.004	0.575***	0.2615
	(-0.52)	(0.38)	(1.83)	(-0.11)	(-2.45)	(-0.15)	(5.96)	

Match by closest scores:

	Move in MSA	Match MSA	Dif	t
Population (in mil)	14.48	14.47	0.014	(0.18)
Wage	29369	30035	-666	(-1.44)
Per capita income growth	5.68%	5.82%	-0.14%	(-0.98)
Employment growth	2.02%	2.00%	0.02%	(-0.11)
Population growth	1.36%	1.16%	0.21%	(1.56)
Private business growth	2.08%	2.10%	-0.02%	(-0.16)

Match models for MSAs that have net move outs:

Logit:	Pop (log)	Wage (log)	Finance	Service	Ind Tax	Corp Tax	Num HQ (log)	Pseudo R2
Move out	0.022	-0.714	9.299**	-0.547	0.039*	0.015	0.593***	0.2983
	(0.15)	(-0.70)	(2.06)	(-0.19)	(1.77)	(0.62)	(3.54)	

Match by closest scores:

	Move out MSA	Match MSA	Dif	t
Population (log)	14.5	14.4	0.107	(1.28)
Wage	34399	32712	1687	(1.21)
Per capita income growth	5.31%	5.36%	-0.05%	(-0.28)
Employment growth	1.34%	1.74%	-0.40%**	(-2.13)
Population growth	0.98%	1.12%	-0.14%	(-1.23)
Private business growth	1.56%	1.80%	-0.24%	(-1.58)

Appendix A4. Relocation Consequences (Robustness)

Table reports multivariate regression results on changes in long-term shareholder performances (Panel A) and changes in employees and creditors wealth (Panel B) on the relocation dummy. Changes are calculated for the period of three years after relocations and three years before relocations. Year and industry dummies are included and standard errors are clustered at industry level. Panel C reports multivariate regression results of community growth rate changes on the number of moves. # net move is positive when there is a net move in and negative when there is a net move out for a MSA. $ Value net move is the total market value of the move in firms subtract the value of the move out firms in a given year. Year dummies are included and standard errors are clustered at MSA level. t tests are in bracket. *, **, *** corresponds to significance at 10%, 5%, and 1% respectively.

Q is tobin's average q, calculated as total assets subtract the book value of equity and plus the market value of equity (price times common shares outstanding), and then divided by total assets. *TFP growth* is calculated as the residual of revenue growth rate net of growth accounted by capital and labour. *ROA* is net income divided by total asset. *SG&A/revenue* measures headquarter efficiency and is the sales, general and administration cost scaled by total asset. *Corporate Tax* is the amount of corporate tax paid divided by pre-tax operating income. *Leverage* is total debt divided by total assets. *Credit rating* is a score corresponding to each credit rating (AAA to SD), where higher scores correspond to lower credit ratings.

Panel A. Shareholders

	(1) ΔQ	(2) ΔTFP growth	(3) ΔROA	(4) ΔSG&A/ Revenue	(5) Δ Tax
Move	-0.038	-0.012	0.000	-0.003	-0.013
	(-1.13)	(-0.99)	(0.05)	(-0.59)	(-0.93)
Δ Assets (log)	-0.031	-0.008**	0.042***	-0.018***	0.056***
	(-0.95)	(-2.32)	(13.21)	(-8.06)	(5.99)
Δ Leverage	-0.399***	-0.028***	-0.148***	0.025***	-0.158***
	(-3.70)	(-2.81)	(-16.15)	(3.64)	(-5.32)
Assets (log)	-0.006	0.003***	0.005***	-0.001	0.001
	(-0.67)	(2.71)	(4.41)	(-0.68)	(0.33)
Book/ Mkt	-0.076***	0.008***	-0.013***	-0.004***	-0.020***
	(-4.23)	(3.16)	(-9.38)	(-3.72)	(-3.61)
Lag dependent	-0.472***	-1.089***	-0.518***	-0.153***	-0.843***
	(-19.36)	(-84.41)	(-9.96)	(-10.92)	(-13.69)
Constant	0.424***	0.072***	-0.006	0.033***	0.173***
	(5.52)	(8.37)	(-0.84)	(5.29)	(6.20)
Obs	20,468	20,775	20,775	20,775	17,593
Adj R2	0.488	0.576	0.338	0.137	0.287

Panel B. Employees and Creditors

	(1) Δ Employee (log)	(2) Δ Credit rating	(3) Δ Leverage
Move	-0.054**	-0.012	-0.001
	(-2.16)	(-0.09)	(-0.12)
ΔAssets(log)	0.698***	-1.161***	0.007
	(43.42)	(-9.18)	(0.98)
ΔLeverage	-0.183***	4.002***	
	(-4.46)	(9.33)	
Assets (log)	0.051***	-0.122***	0.004***
	(5.05)	(-3.17)	(2.86)
Book/Mkt	-0.009	0.494***	0.005*
	(-1.50)	(5.83)	(1.79)
Lag dependent	-0.074***	-0.142***	-0.246***
	(-6.56)	(-12.49)	(-14.43)
Constant	-0.225***	2.738***	0.037***
	(-8.82)	(7.80)	(3.06)
Obs	20,775	7,884	20,775
Adj R2	0.606	0.278	0.157

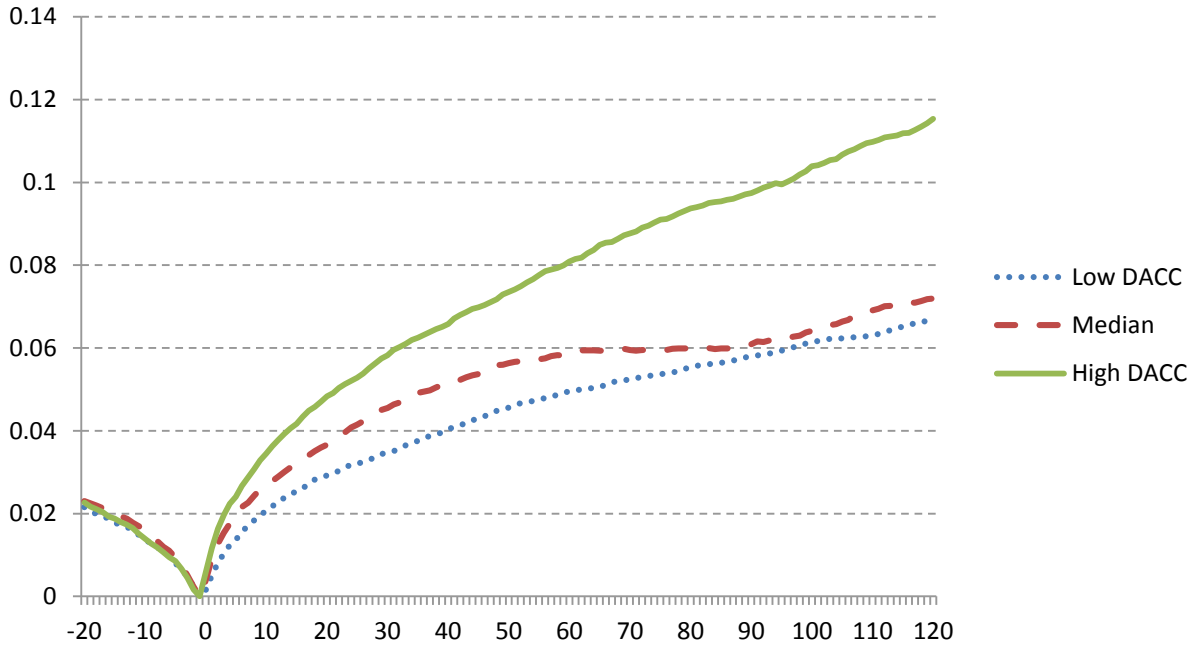
Panel C. Communities

	(1) Δ Pop growth (%)	(2) Δ Emp growth (%)	(3) Δ Inc growth (%)	(4) Δ Bus growth (%)	(5) Δ Pop growth (%)	(6) Δ Emp growth (%)	(7) Δ Inc growth (%)	(8) Δ Bus growth (%)
# Net move	-0.047	-0.001	0.023	-0.035				
	(-1.23)	(-0.02)	(0.24)	(-0.67)				
$ Value net move					-0.007	-0.014	0.010	0.002
					(-0.28)	(-0.46)	(0.20)	(0.07)
# HQs	0.097***	0.117***	0.101	0.035	0.097***	0.117***	0.101	0.035
	(4.05)	(3.09)	(1.54)	(0.94)	(4.03)	(3.09)	(1.54)	(0.94)
Pop (log)	-0.080***	0.047	0.107	0.056	-0.079***	0.047	0.106	0.056
	(-3.36)	(1.24)	(1.65)	(1.52)	(-3.35)	(1.23)	(1.63)	(1.52)
Income (log)	-0.216	-1.542***	-2.978***	-0.613**	-0.215	-1.542***	-2.978***	-0.610**
	(-1.14)	(-5.19)	(-6.65)	(-2.29)	(-1.14)	(-5.19)	(-6.65)	(-2.29)
Δ Pop growth		1.300***	0.263	1.168***		1.300***	0.263	1.168***
		(16.96)	(1.42)	(11.81)		(16.93)	(1.41)	(11.82)
Constant	2.419	12.730***	26.063***	2.101	2.407	12.736***	26.066***	2.067
	(1.53)	(5.23)	(7.27)	(0.83)	(1.52)	(5.24)	(7.28)	(0.82)
Obs	4,038	4,038	4,038	2,424	4,038	4,038	4,038	2,424
Adj R2	0.057	0.724	0.599	0.705	0.056	0.724	0.599	0.705

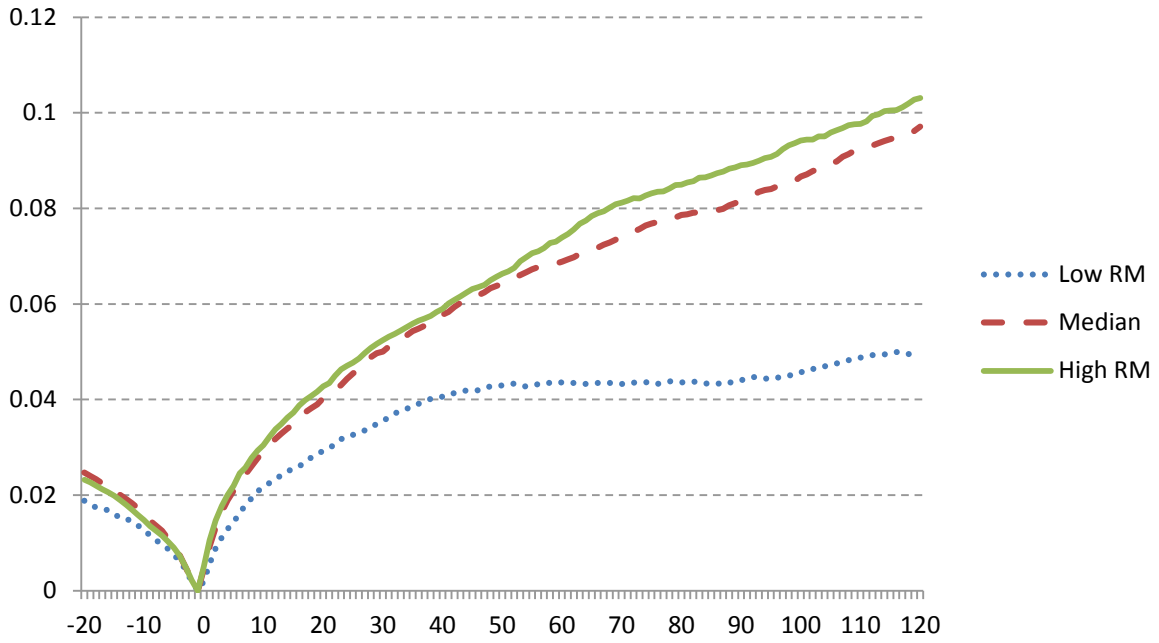
Figure 3.1 Opacity and Stock Market Reactions to Insider Buys

Figure displays stock market reactions surrounding insider buys. We divide our sample by high/low/median DACC/real earnings management (RM)/firm specific return variation. Horizontal axis shows the event days, where day 0 is the day of insider trading. Vertical axis is the cumulative abnormal return corresponding to the event days. Abnormal returns are calculated using the market model. DACC is measured using the log of moving sum of absolute accruals over the past three years. Real earnings management is the log of the moving sum of absolute discretionary SG&A over the past three years. Firm specific return variation is the log transformation of the moving sum of the R^2 over the past three years, calculated as log ((1- R^2)/ R^2).

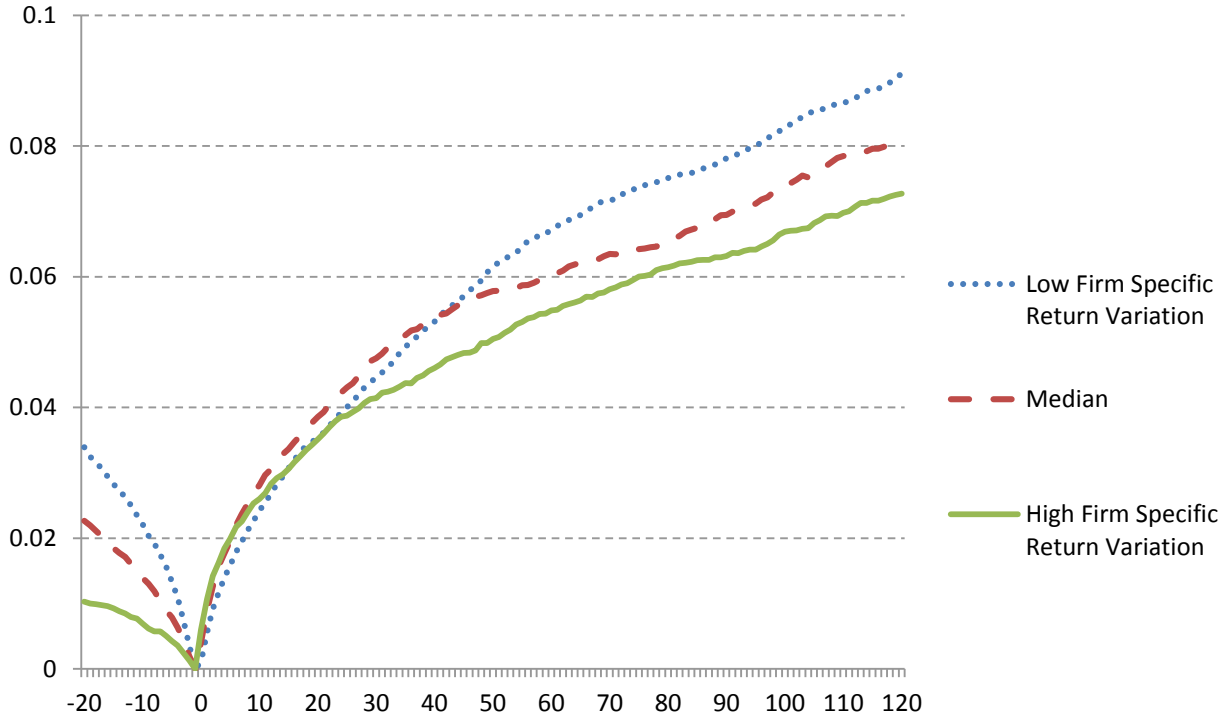
a. By DACC.



b. By Real Earnings Management.



c. By Firm Specific Return Variation.



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