TWO ESSAYS ON FIRM VALUE AND HEDGE FUNDS' ACTIVISM IMPACT

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ABSTRACT

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In the first essay, I study the relationship between a firm's employee satisfaction and the firm's stock return, using Glassdoor data. First, I find that human capital is a valuable firm asset. Stock portfolios of firms with high employee satisfaction earn positive risk-adjusted returns. Second, contrary to the finding of Green et al. 2019, I find that firms with declining employee satisfaction outperform firms with improving employee satisfaction. Third, I find that change of employee satisfaction is associated with future accounting profitability but not with stock idiosyncratic volatility after controlling firm characteristics.

In the second essay, I study the hedge fund activism's impact on target firms and employees of target firms. Hedge fund activism has grown rapidly over the last thirty years. Prior literature shows that hedge fund activism improves target firms' value and operational performance. However, whether such improvement is beneficial to target firms in the long-term is under debate in academic circles. In this study, I study the impact of hedge fund activism through the eyes of the employees of target firms. I find that hedge fund activism has a negative impact on the business of target firms. I also find that hedge fund activism reduces employees' career opportunities within target firms. The reduction of career opportunities corroborates studies showing that target firms lose valuable human capital after hedge fund activism. Overall, my study is consistent with a strand of

burgeoning literature showing that hedge fund activism delivers negative impact to target firms and their employees.

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CHAPTER 1 FIRM VALUE AND EMPLOYEE SATISFACTION[1]

1. INTRODUCTION

Economics and management scholars have long sought to understand the empirical relationship between firms' human capital and financial markets. Their views on the role of human capital within firms have changed over the years. In the early twentieth century, Taylor (1911) viewed labor force as merely the nuts of production. He believed that there is no skilled work and that workers are easily replaceable. As described by Drucker (1993), "In manual operations there is only "work." All work can be analyzed the same way". Taylor's views on workforce have predominated until the 1950s and, although not specifically acknowledged, are deeply embedded in management science. A contrasting view was pioneered by Maslow (1943) and later popularized by McGregor (1966). In this later view, human capital is recognized as one of the key assets of firms and it is important for management to keep the labor force feel fulfilled in order to realize the labor force's full potential. Because human capital plays a central role in innovation, this later view is more relevant to modern firms which derive their profits from innovation. Edmans (2011) provides evidence supporting Maslow's view over Taylor's.

Labor force turnover costs can deter firms from firing an employee. A firm can also be deterred from firing an employee after it invests in this specific employee because the worker can threat to leave. By leaving the firm, the employee would nullify the firm's investment on himself/herself. Such a "hold-up" problem can lend workers bargaining power over sharing of a firm's return on its investments. (For a review, see Malcomson, 1997).

[1] My research was carried out concurrently with ongoing similar research (Green et al., 2019).

Taylor's and Maslow's theories have different implications for the relationship between level of employee satisfaction and stock returns. According to Taylor, the labor force is easily replaceable. His theory predicts that a large supply of non-skilled and easily replaceable workers in the labor force decreases the relevance of employee satisfaction to firm value and, thus, is not relevant to stock returns. On the other hand, Maslow's view of the labor force predicts that firms with more satisfied employees may benefit from more innovation. Thus, high employee satisfaction may translate into positive abnormal returns if human capital information is not fully incorporated in the marketplace.

The relationship between the change of employee satisfaction and stock returns is complex. A firm with declining employee satisfaction may experience more volatility in retaining talented workers. Volatility in talent retention would be expected to lead to more risk for the company. Consequently, investors may command more of a risk premium for such a firm[2]. Such volatility may be more readily observable in firms at the low end of the employee satisfaction than in those at the high end of the employee satisfaction. On the other hand, different factors are significant in firms with high employee satisfaction versus those with low employee satisfaction. The "hold-up" problem may lead to a disproportionate amount of profit allocated to an employee. A decline in employee satisfaction may imply a decline of labor's bargaining power. Such a decline in labor's bargaining power will lead to more profit allocated to the shareholders via cost cutting on human capital. Thus, a decline of employee satisfaction could potentially be associated with an operational efficiency increase in firms. If the declines of both labor bargaining power and employee satisfaction are not readily observable by outside investors, a decline

[2] I thank for the suggestion of this explanation of risk premiums by professor Morald Zekhnini at Freeman Business School of Tulane University

of employee satisfaction can translate into positive abnormal returns. For firms with high employee satisfaction, the labor's bargaining power is most likely high. Thus, a decline of employee satisfaction can translate into positive abnormal returns and increase of firm operational efficiency. For firms at the low end of employee satisfaction, there is not much labor's bargaining power to begin with, thus not much profit can be reallocated to shareholders. So, a positive abnormal return may not be observed with a decline of employee satisfaction in firms at the low end of employee satisfaction. However, an increase in employee satisfaction in firms with low employee satisfaction may also translate into positive abnormal returns through better retention of talent.

In this chapter, I study the relation of employee satisfaction and firms' stock returns empirically, using review data from Glassdoor. It was rare to encounter real-time information about the inner workings of a firm and its employees' views on itself. However, with the advances in technology and widespread use of internet, websites where employees can write about their firms and their life in those firms start to spring out recently. Glassdoor is such a website. Since 2008, Glassdoor have collected huge amount of real-time information about firms and their employees by providing a platform where both former and current employees can write reviews about their firms. Those reviews are then shared with the public on Glassdoor website without revealing reviewer's actual identification. Those reviews provide a unique opportunity for outsiders to take a glance at various aspects of a firm and its employees in real-time. Based on the ratings, Glassdoor ranks companies each year and awards Best Places to Work to top-ranked companies. Besides providing a platform for writing reviews, Glassdoor also provide a platform for people to share interview questions which they were asked when they interviewed with a

company. To reduce spam and bias, Glassdoor also makes sure that each review is written by a real employee "through technological checks of e-mail addresses and through screenings by a content management team"(Wong, 2013). As stated by Glassdoor, 20% of the entries are rejected after screening[3].

I limited this study to domestic companies listed on NYSE, NASDAQ and AMEX. I used the overall score of the company, and whether the employee recommends her/his job to friends as proxies of employee satisfaction, as well as changes in those scores.

First, I extended the results of Edmans (2011), by showing that, in general, employee satisfaction, which is not observed by the markets directly, has predictive power over future stock returns. I found that firms with good overall scores, or firms most recommended by employees, exhibit positive abnormal returns, after adjustment with a Fama-French-Carhart four-factor risk model. Edmans' (2011) study found 0.29% monthly four-factor alpha (3.5% annually) for the period 1984 to 2009. Replicating his methods, I found 0.225% monthly four-factor alpha (2.73% annually) for the portfolio of firms in the top quartile of the overall score and 0.232% monthly (2.82% annually) for the portfolio of firms in the bottom quartile of the job recommendation score for the 2008-2015 period, noticing that for job recommendation score at this chapter, high score means not recommending the job. Moreover, I showed that the level of employee satisfaction is generally priced into the market gradually. Even for a 24-month holding period, my results are strongly significant. This result is consistent with Maslow's view of the labor force.

Secondly, I looked at changes in employee satisfaction. In contrary to the finding of Green et al., 2019, I found that reduction of employee satisfaction is associated with a

[3] Calgary Herald, April 10, 2013,Website lets workers rate their bosses anonymously.

positive risk-adjusted abnormal return. Particularly, for portfolios based on the change of job recommendation score, declining firms outperform improving firms most, by a monthly four-factor alpha of 0.423% (5.2% annually). For portfolios based on the change of overall score, declining firms outperform improving firms most by a monthly four-factor alpha of 0.37% (4.53%).

Thirdly, to further investigate the relationship between change of employee satisfaction and stock returns, I partitioned the firms into most recommended and least recommended firms and performed the portfolio construction on both groups of firms. I found the same result in the most recommended firms, while I did not find similar results in the least recommended firms. Particularly, for portfolios constructed based on most recommended firms, firms with declining employee satisfaction outperform firms with improving employee satisfaction most by a monthly four-factor alpha of 0.635% (7.89% annually). For most declining-improving portfolios constructed on least recommended firms, I found no significant alphas. These results are consistent with the theory that a not readily observable decline of employee satisfaction may imply a decline of labor's bargaining power and thus predicts a positive abnormal return.

Fourthly, I studied the relation between change of employee satisfaction and future accounting profitability and the relation between change of employee satisfaction and future idiosyncratic volatility. I found that after controlling firm characteristics, decline in employee satisfaction is associated with gain in future profitability for firms above median employee satisfaction. I also found that, after controlling firm characteristics, there is no association between future idiosyncratic volatility and change of employee satisfaction. Those results further confirm that the abnormal returns of declining-improving portfolios

based on sorting of change of employee satisfaction may be associated with efficiency gains instead of risk change.

Overall, my results show that human capital as the source of innovation of modern firms is a valuable asset, and its value is not readily incorporated in the marketplace. My results also suggest a decline of employee satisfaction in firms with high employee satisfaction can be associated with operational efficiency increase, which is not readily incorporated in the marketplace. Such efficiency increase may be a result of a decline of labor's bargaining power manifested as decreasing employee satisfaction.

2. DATA AND SUMMARY STATISTICS

The review data is obtained directly from Glassdoor, a company started in 2008. The data spans from January 2008 to July 2015. However, I chose data from June 2008 for portfolio construction because very few companies are matched with Compustat and CRSP linked database (CCM) before June 2008 and the data before June 2008 have a strong upward bias. Each review contains a mandatory overall score and separate scores on benefit, work & life balance, culture & value, career opportunities, compensation & benefits, senior management, recommendation to a friend, business outlook and approval of CEO. I mainly focus on the overall score, a 1-5 score, and job recommendation score, a 1 (yes) or 2 (no) score since those two scores are most related to my study and do not change their definitions when Glassdoor changed definitions of many of the variables in its database in May 2012. A sample of Glassdoor review is attached in the Appendix C

All fundamental data are from the annual Compustat data. Return and price data are from CRSP. Both Compustat data and CRSP data are available through December 2015. Only domestic firms with common stock (share code 10 and 11) listed on NYSE,

NASDAQ and AMEX are considered in this study. A two-step name matching method is used to match the names in Glassdoor data with the historical legal names in Compustat. In the first step, names in both Glassdoor and Compustat are harmonized by the Magerman harmonization method (Magerman, Van Looy, and Song, 2006) and then matched using the frequency inverse similarity measure (Magnani and Montesi, 2007). In the second step, companies with low matching score are manually checked and matched, and Glassdoor companies matched with multiple Compustat historical names are manually disentangled. Totally, 3934 domestic firms with common stocks listed on NYSE, Nasdaq and AMEX exchanges were matched in terms of permco. The number of companies having reviews in a particular month increases with time from 2 in January 2008 to 1889 in June 2015, with a jump to 867 companies in June, 2008. The proportion of those companies having reviews in a particular month to the number of companies in the CCM also increased from a meager 0.04% as of January 2008 to 50% as of June 2015. with a jump to 19% on June of 2008. Figure A.1 (a), (b) shows those trends. Table A.1 shows the descriptive summary statistics of stocks of companies in the Glassdoor and of stocks in CCM. For companies in Glassdoor, the data for summary statistics are included only after the companies entered the Glassdoor database. The firms in Glassdoor have larger market capitalization than firms in the CCM database and are slightly more orientated toward growth firms than those in the CCM. Fama-French 10-industry composition of firms having reviews in each June of 2008 2012 and 2015, are shown in Figure A.2. Industries of high technology, shops, and telecommunication have larger proportions in the matched firms than in the CCM database.

Table A.2 tabulates the statistics and correlations of the concerned score variables. As in Table A.2, the median of overall score is 3 on a scale of 1-5. Thus, about 50% of the

companies have a good rating. The job recommendation score is coded 1 as Recommend and 2 as Not Recommend. From Table A.2, it is evident that more than 50% of people are willing to recommend her/his firm to a friend. Thus, the reviews in Glassdoor does not suffer from a bias toward reviews from disgruntled reviewers.

Sample selection bias can also be a problem for Glassdoor data. However, a few facts about Glassdoor alleviate such concerns. Any person having a Glassdoor account can write reviews about her/his current or former employers within five years. The reviews are anonymous. The reviewers can write in any place she/he feels comfortable. However, each person can only write one review per year per employer. To sign up for a Glassdoor account, one needs a permanent email account or a social network account like FaceBook. Email verification is required to validate the account. This combination of a limit of one review per year per employer and the requirement of a permanent email address or social network account can make it much more difficult for spammers to write multiple reviews about the same company for a living. To guarantee the neutrality of Glassdoor itself, especially to prevent Glassdoor from favoring companies who have business with itself, Glassdoor promises that they never edit the contents of any reviews or never delete any content because it is lower rated or higher rated. Glassdoor also applies the same standard for every review. In particular, Glassdoor applies the same proprietary algorithm to guarantee the review follows Glassdoor guidelines. Furthermore, Glassdoor applies a proprietary filter and algorithm to reduce abuse and gaming.

3. METHODOLOGY

3.1 Portfolio construction

For each score, two portfolios are constructed. The first portfolio consists of firms with top average score during the look back period. I call the first portfolio the level portfolio. The second portfolio is constructed by longing a portfolio of firms whose employee satisfaction is declining the most and shorting a portfolio of firms whose employee satisfaction is improving the most. I call the second portfolio declining-improving portfolio. For overall score, a firm with declining (improving) employee satisfaction is a firm whose average overall score decreases(increases). For job recommendation score, a firm with declining (improving) employee satisfaction is a firm whose average job recommendation score increases (decreases). For both portfolio constructions, equal weighting and quartile portfolio are used. An overlapping strategy of portfolio construction (Jegadeesh,1993) is applied to increase power. For example, with look-back=3 months and holding period=3 months, at the end of each month I construct a portfolio based on the sorting of (the change of) the concerned average score. Then, I hold this portfolio for 3 months. At the end, I average the returns of three portfolios constructed respectively one month ago, two months ago and three months ago, to obtain the return for the month. All portfolios are balanced monthly to maintain equal weighting. I replace a stock's return with value weighted market return from CRSP when a stock does not have return in the concerned month and drop the stock from the corresponding portfolio afterwards. I also restricted the data set to firms with more than or equal to five reviews in the look-back period at the time I sorted the stocks. For the declining-improving portfolio, the restriction means that the firms not only need to have more than or equal to five reviews

for the look-back period ending at the sorting time but also need to have more than or equal to five reviews for the previous look-back period. Only stocks with price higher or equal to $1 are considered to form portfolios. However, the $1 restriction is not applied when sorting the stocks. Special attention is given to avoid forward-looking when computing the average score. In particularly, when a review is posted after the last trading day of the month but before the end of the same month, the review will be counted toward the immediately following month instead of being counted toward the current month. The portfolio construction data starts from June 2008 instead of January 2008 because there are too few matched companies before June 2008.

4. EMPIRICAL RESULTS AND ROBUST CHECKS

4.1 Result for the level portfolios

Panels A and B of Table A.3 are the four-factor alphas of level portfolios based on job recommendation score and overall score with different combination of look-back periods and holding periods. The level portfolio of job recommendation (overall) score consists of firms with average job recommendation (overall) score of the look-back period in the bottom (top) quartile. The four-factor alphas of both level portfolios exhibit similar patterns. One pattern is that the alphas became larger and more significant when the holding periods become longer, this pattern indicates that the value of the human capital became gradually known to outside investors with the progress of time and it takes a long time for the value of human capital to show up in company profits. The other pattern is that the first portfolios with alphas significant at 5% level for each look-back period approximately forms a line. This approximate linear relation indicates that the sums of look-back period and holding period are approximately same. This linear relation may indicate it takes the outside

investors one to one and a half years to notice the value of the human capital. The alpha with holding period = 12 months and look-back period = 12 months is 0.232% (0.225%) for overall score (job recommendation score). Compared with the 0.29% alpha from Edman's 2011 study, the alpha is smaller.

4.2 Result for alphas of declining-improving portfolios and robustness check

Panels A and B of Table A.4 are the four-factor alphas of declining-improving portfolios based on the change of overall score and change of job recommendation score. The employee satisfaction declining portfolio of overall score (job recommendation score) consists of firms whose change of average overall score (job recommendation score) is in the bottom (top) quartile. The employee satisfaction improving portfolio of overall score (job recommendation score) consists of firms whose change of average overall score (job recommendation score) is in the top (bottom) quartile.

Both panels show that firms with declining employee satisfaction outperform firms with improving employee satisfaction. For declining-improving portfolios based on the change of job recommendation score, declining firms outperform improving firms most by a monthly four-factor 0.423% (5.2% annually) with look-back=7 months and holding-period=6 months. For declining-improving portfolios based on the change of overall score, declining firms outperform improving firms most by a monthly four-factor alpha of 0.37% (4.53% annually) with look-back=7 months and holding period=3 months. There is an approximate linear relationship between the look-back period and holding period of the first portfolios with alphas significant at 1% level of each look-back period. However, there is no clear linear relationship between the look-back period and holding period of the first portfolios with alphas significant at 5% level.

I performed a few robustness checks. Tables are presented in the Appendix C. First, I partitioned my data into three time periods: June 2008-December 2011, January 2010-December 2013, and January 2012-December 2015. For declining-improving portfolio based on change of job recommendation, four-factor alphas significant at least at 10% level concentrates on look-back periods of 7, 8, 9, 10, 12, 13 months across the three time periods. For declining-improving portfolio based on the change of overall score, the look-back periods of four-factor alphas that are significant at least at 10% level does not overlap very well. Second, I restricted the data set to firms with number of reviews in the look-back period more than or equal to 10 and 15. I still get significant four-factor alphas. However, four-factor alphas with long look-back periods and long holding periods start to become insignificant while still maintaining their signs. This phenomenon on long look-back periods and long holding periods may be due to the fact the number of reviews is a proxy for how difficult it is for the outsider investor to obtain information about the company. The more the number of reviews, the quicker and easier for the outside investors to obtain information. Thus, with the increase of cutoff of the number of reviews, the information became stale faster, and significant alphas with long look-back periods and long holding periods disappears.

4.3 Fama-Macbeth result

Fama-Macbeth regression is also performed for each combination of look-back period and holding period. For each month, the cumulative excessive return of the holding period is regressed on the average score ($\text{Score}^{i}_{t-\text{holding},t}$), the change of the average score ($\Delta\text{Score}^{i}_{t-\text{holding},t}$) and firm control characteristics. Firm control characteristics include the logarithm of the Book-to-Market ratio (BM), the logarithm of market capitalization,

previous year momentum, current month return, previous year idiosyncratic volatility and industry fixed effect. Newey-West estimation of variance is applied to reduce possible serial correlation in time. The lag of the Newey-West estimation is chosen to be the larger of the look-back period and holding period. The cross-section regression formula is:

$$re^{i}_{t,t+holding} = \alpha_t + \beta_t Score^{i}_{t-holding,t} + \gamma_t \Delta Score^{i}_{t-holding,t} + \theta_t Mom^{i}_{t-1,t-12} + \sigma_t R^{i}_{t-1,t}$$

$$+ \rho_t \ln\left(ME^{i}_{t}\right) + \rho_t \ln\left(BM^{i}_{t}\right) + \omega_t ivol^{i}_{t-1,t} + industry + \varepsilon^{i}_{t}$$

From the panels in Table A.5, one can see that the coefficients of change of both job recommendation and overall score are significant across look-back periods and holding periods. The sign of those coefficient is also consistent with the portfolio construction results.

4.4 Partition of most recommended and least recommended firms

As discussed in the introduction, a decline of labor's bargaining power manifested as a decline of employee satisfaction can predict positive abnormal returns in firms with high employee satisfaction but cannot predict positive abnormal returns in firms at the lower end of employee satisfaction. To test this theory, I partitioned firms into most recommended firms and least recommended firms. Then I perform declining-improving portfolio construction for each group of firms to see whether I see positive abnormal returns in most recommended firms and no positive abnormal returns in least recommended firms. A firm is classified as a most (least) recommended firm if the firm's average job recommendation scores in the previous look-back period is less than or equal to (larger than) its median. An alternative definition is also applied where I require firm's average job recommendation score both in the previous and current look-back periods to satisfy the partition condition. I present those results in Table A.6. The result for an alternative

definition is presented in Appendix C. For most recommended firms, compared with results from all firms, the four-factor alphas are larger and more significant. Employee satisfaction declining firms outperform employee satisfaction improving firms most by 0.635% (7.89% annually) with look-back period=8 months and holding period=2 months. However, for the alternative definition of the most (least) recommended firms, the result is not stronger than the result from all firms. This is likely because the number of firms in the alternatively defined most recommended firms is reduced. The reduction of the number of firms in the alternative definition of most recommended firms makes the long-short portfolio less diversified for other risks. My results are consistent with the theory that the positive abnormal returns of declining-improving portfolio may be explained by the decline of labor's bargaining power manifested as a decline of employee satisfaction and consequently an increase in firms' operational efficiency

4.5 Change of score, accounting profitability and idiosyncratic volatility

While section 4.4 provides some evidence that decline of labor's bargaining power and efficiency gains may explain the predicative power of change of employee satisfaction on firms' stock returns, I also check whether the change of employee satisfaction is associated with future gains in accounting profitability and whether the change of employee satisfaction is associated with future idiosyncratic volatility of the firms' stock returns. In this regard, I regress the one-year ahead profit margin on current profit margin, the interaction between past 6-month score change and an indicator whether a firm is a firm with high employee satisfaction 6-month prior, and some other firm characteristics. Those firm characteristics include possible outsider monitoring proxied by long term debt and other risk factors proxied by firm's market capitalization, book-to-market ratio, and firm's

investment proxied by firm's capital investment, and research & development. The result is reported in Table A.7. The decline of overall rating for high rating firms are associated with increase of future profit margin, while similar association is also found between the increase of job recommendation score and increase of future profit margin. Similar regressions are done on the future 6-months stock idiosyncratic stock volatility. As in table A.8, after controlling other risk factors, both changes of overall rating and changes of job recommendation score for firms with employee satisfaction are not associated with future idiosyncratic volatility. Thus, my result further confirms the theory that abnormal return of the long-short portfolio based on the change of employee satisfaction is associated with efficiency gains instead of with risk changes

5. CONCLUSION

In this paper, I have empirically studied the relation between employee satisfaction and stock returns through reviews of domestic firms on the Glassdoor website. Given the measures Glassdoor takes to improve neutrality regarding reviews and measures to prevent abuse and gaming, I believe that the Glassdoor data has less selection bias than most of the surveys and thus provides a good and real-time feedback from employees. My study shows interesting results. First, it extends and confirms Edman's 2011 study and asserts that human capital is a valuable asset to firms. Second, in contrary to the findings of Green et al., 2019, I found that firms with declining employee satisfaction outperforms firms with improving employee satisfaction. Thirdly, I found that, within the group of firms with high employee satisfaction, employee satisfaction declining firms outperform employee satisfaction improving firms significantly, after adjusting for risks, while no significant outperformance is found in the group of firms with low employee satisfaction. Such an

asymmetry between the firms with high employee satisfaction and those with low employee satisfaction is not consistent with the risk story that declining employee satisfaction leads to volatility in talent retention and, subsequently, leads to higher risk and high stock returns. Instead, such asymmetry is consistent with the theory that a decline of employee satisfaction implies a decline of labor's bargaining power and that consequently a decline of employee satisfaction predicts a positive abnormal returns and operational efficiency gains in firms with high employee satisfaction. Indeed, I found that a decline of job satisfaction in the firms above median employee satisfaction is associated with an increase of one-year ahead profit margin but not with the increase of 6-month ahead idiosyncratic volatility.

CHAPTER 2 HEDGE FUND ACTIVISM THROUGH THE EYES OF EMPLOYEES

1. INTRODUCTION

With the separation of control and ownership in corporate structure, the agency problem presents itself as one of the main conflicts between management and shareholders. As voting power is distributed over many small shareholders, the power of the small shareholders becomes diminished due to the free rider problem, while the power of management becomes dominant in the relationship between management and shareholders. With dominant power, management may engage in self-interest serving activities such as empire building and requisite consumption (Tirole, 2010). Such self-interest serving activity can be detrimental to shareholders. To discipline management to serve the interests of shareholders, many approaches have been tried(Aslan, 2021). In the mid-80s of the last century, when institutional shareholdings grew significantly, institutional investors such as mutual and pension funds started shareholder activism to pressure management for improvement when their investment in a firm started to decrease in value, due to poor firm performance(Denes et al., 2017). Such shareholder activism usually takes the form of a proxy proposal in an annual shareholder meeting. Shareholder activism by institutional investors barely has any impact on firm performance(Black, 1998; Gillan and Starks, 2000; Karpoff, 2011). Even when there is an impact on firm performance, the impact is small and insignificant. During the last decades of the twentieth century, shareholder activism by hedge fund investors became popular. Such shareholder activism is commonly known as hedge fund activism. In a hedge fund activism campaign, a hedge fund will purchase shares with voting power in a target firm(Klein and Zur, 2006). After the hedge fund gains enough voting power, the hedge fund will pressure management for a change. Such changes can involve payout increase, asset divesture, business strategy changes and corporate

governance changes. In contrast to the shareholder activism by institutional investors, hedge fund activism proves to be quite effective in improving firm performance(Aslan, 2021; Brav et al., 2008a; Denes et al., 2017) . However, whether such an improvement is good in the long term for the firm or not is still a debate in the academic world(Aslan, 2021). Due to its significant impact on target firms, in this study I focus on hedge fund activism. I also focus on the impact of hedge fund activism on a target firm from the point of view of an employee in the target firm.

Earlier studies showed that hedge fund activism is effective in improving shareholders' interests. A few studies showed that the stock value of a target firm increased right after a hedge fund initiated the shareholder activism against the firm. Brav et al.(2008) observed an 8.4% average increase of abnormal returns during the (-20,20) days window around the 13D filing date. Another strand of earlier research focused on the operational performance of target firms after the hedge fund activism. Earlier research (Bebchuk et al., 2015; Brav et al., 2015a; Greenwood and Schor, 2009) showed that the target firms' return on assets increased after hedge fund activism. Brav et al., 2015a showed that plant productivity increased after hedge fund activism. Also Brav et al. (2018) showed that hedge fund activism improved innovation efficiency. However, more recently, Cremers et al., (2018) showed that the operational performance does not improve relative to a similar poor performance firm, matched with propensity score of being targeted by a hedge fund. Hedge fund activism usually lasts about one to three years (Aslan, 2021). It is in the interest of hedge fund activists to realize profits within this time span. Thus, it is reasonable for them to engage in short term profit seeking strategies, while sacrificing long-term firm interest. The debate over short-term and long-term benefit to targeted firms is not only important to

shareholders but also important to society. In my study, I will look at this debate through the eyes of employees. My results support the claim that hedge fund activism is detrimental to target firms in the long term.

Hedge fund activism centers on the interest of the shareholders, especially around the very interest of the activists who carry out the activism. However, there are many more stakeholders other than the shareholders in a corporate structure. Such studies on other stakeholders are relatively few. A more recent review can be found in Aslan (2021). Bond holders and employees of target firms are just two examples of such stakeholders. Aslan and Maraachlian (2007) and Klein and Zur (2011) show that bonds of target firm experience negative returns during the activism period, supporting the idea that hedge fund activism impairs bond holders' interests, and transfers wealth from bond holders to shareholders. Some research on hedge fund activism points to a wealth transfer from employees to shareholders and to a long-term negative impact on firm human capital. Brav et al. (2015) used a panel of plant data in the US to study the impact on employees after the hedge fund activism. They found that layoffs and wage stagnation follow hedge fund activism campaigns. Agrawal and Yuree (2022) studied the impact of hedge fund activism on a target firm's contribution to a firm's pension fund, and found that management reduces pension fund contributions after hedge fund activism, compared to the pension fund contribution by a matched non-target firm. Chen et al. (2021) also showed that target firms experienced more loss of valuable human capital compared to a matched non-target firm. Nevertheless, it is not surprising that hedge fund activism negatively impacts other shareholders, given the fact that hedge fund activists act in their own best interest, while they may expropriate the interest of other stakeholders. In my study, I also study how

hedge fund activism may impact stakeholders other than the shareholders. I particularly focus on the impact on target firms' employees.

Prior research has relied on efficiency changes highly visible to outsiders, such as innovation efficiency change, plant productivity change and return on asset change to assess the impact of hedge fund activism on target firms. Relying on such highly visible efficiency change, a favorable assessment of long-term impact on target firms by hedge fund activism may well be called into question if the hedge fund activism increases the highly visible efficiency, at the cost of not highly visible efficiency. In fact, as human capital is hard to quantify, and thus not highly visible, Chen et al., (2021) showed that target firms lose valuable human capital following hedge fund activism. This loss of human capital may well be the result of an increase of innovation efficiency through reduction of research and development and capital expenditure, or the result of increases in production efficiency through divesture of assets and wage stagnation. Thus, it is problematic to just use those highly visible efficiency measurements to assess the impact of hedge fund activism on target firms. On the other hand, layoffs, wage stagnation and pension fund underfunding are not necessarily bad for either the current employees or the target firms. For example, if a target firm has a larger than necessary workforce, a layoff means improved production efficiency and may mean a better future for those employees who are not laid off. For compensation and benefits, a reduction in pension fund contribution may stop an unsustainable, prior large contribution and thus benefit current employees in target firms in the long term. In this study, I focus on reviews from the employees. The information contained in the reviews are not raw and hard information, like the aforementioned highly visible efficiency measurements. Instead, the review writer has

already processed the raw objective information and distilled the raw objective information into the information we are seeking. For example, after implementation of a strategy change, pushed by a hedge fund activist, an employee of a target firm processes the efficiency improvement, and firm strategy changes information and concludes that the target firm will have a worse business outlook. If we are investigating whether this target firm will benefit long term or not, his/her conclusion on the business outlook is better information than the objective efficiency measurement itself. Thus, the change of employees' views on the target firm can provide us a useful way to evaluate the impact of hedge fund activism. However, similar to the objective measurements, the review scores may suffer from bias not related to the business prospects of the target firms itself.

The welfare of an employee is more related to the long-term performance of a company than to the short-term performance of a company. Short-termism pursued by activists can damage target firms in the long term and will most likely be perceived as an impairment to target firms by employees of target firms. Thus, it is reasonable to assume that a change of perception of the employees about the target firms' performance most likely reflects the change in long-term performance of target firms.

In this study, I first look at the change of assessment on the business outlook by the employees. The business outlook score measures the probability of whether the employee thinks the business is getting better or worse. As argued previously, the business outlook perceived by the employees most likely reflects the target firms' long term business outlook. While the long-term prospect of target firms improves, the probability of the employees to recommend his/her job to a friend or a family member increases. On the other hand, when the long-term prospect diminishes, the probability of recommendation from the employees

will decrease. Thus, in this study, I will also study the job recommendation score of the reviews as additional evidence. The recommendation score in this study is transformed to measures of the probability of an employee to recommend his/her job to a friend or a family member.

The following are my findings. Compared to 2-months before the hedge fund activism takes place, the assessment of business outlook by employees sours in about one year; the employees become less willing to recommend their job to a friend or a family member also in about a year. Besides investigating the impact of hedge fund activism on the prospects of the business outlook of target firms, I also investigate the impact of hedge fund activism on the employees' career and opportunities, and on the employees' compensation and benefits. I find that employees' career and opportunity is reduced after the hedge fund activism. This reduction of employees' career and opportunity corroborates Chen et al. (2021) 's finding of human capital loss after hedge fund activism. For benefits and compensation, unlike prior research findings, I did not find any statistically significant decrease or any statistically significant increase after hedge fund activism.

My study joins a cohort of researchers who study the impact of hedge fund activism on target firms and on the employees of target firms. It contributes to the literature by adding evidence that changes pursued by hedge fund activists most likely are detrimental to the long-term prospect of targeted firms. After hedge fund activism, the targeted firms' long term business prospects are diminished. And the changes pressed by activists are most likely aiming for short-term instead of long-term gains. I also show evidence that hedge fund activism negatively impacts the employees' career and opportunities within the target

firms. Such negative impact on the employees' career and opportunities may decrease the value of intangible human capital in target firms.

2. DATA AND SUMMARY STATISTICS

2.1 Glass door review data

Details of the Glassdoor review data are described in chapter 1 of the dissertation. However, in this chapter, I restricted reviews to those written by employees who are still working for their firms when they wrote their reviews on Glassdoor. By such restriction, I am sure that the reviews are written about the concurrent situation of firms. Compensation and benefits, career and opportunity, are rated from worst to best on a scale of 1 to 5. CEO approval (job recommendation) is converted to 0 and 1, indicating disapproval (not recommended) or approval (recommend). Business outlook is rated as -1,0,1 with -1 indicating business getting worse, 0 indicating business remaining the same and 1 indicating business getting better. The summary statistics of review ratings of current and former employees are presented in Panel A, B of Table B.1. Note that, on average, current employees are more optimistic about their firms than former employees. The relatively higher optimism among current employees implies that if the impact of the hedge fund activism is positive, one should see it at least in the current employees and that a negative change in current employees' view on their firm is a stronger indicator that the impact of hedge fund activism on their firm is negative than a negative change in the former employees' view.

In this study, I use the average review scores of six-month periods. The average review scores are computed by a moving window method, with a window length of six

months. The moving average will be regarded as invalid and subsequently discarded if there are fewer than 5 reviews within the window length of 6 months.

2.2 Hedge fund activism data and hedge fund activism

The hedge fund activism data was kindly provided by Professor Jiang, Wei from Columbia University. The data covers hedge fund activism events from the last quarter of 1993 to the first quarter of 2015. In this study, I only include hedge fund activism events from 2008 to 2014 because the Glassdoor database reviews only start on the second half of 2008. The first quarter of 2015 is also excluded because of the way the probability of a firm being targeted is modeled in this study. I focus on the firms in the Glassdoor database having common stock in the CRSP/Compustat universe, with CRSP share codes 10,11,12. From 2008 to 2014 there are 1289 hedge fund activism events. 621 events happen to a target firm in the Glassdoor database after the target firm entered the glass door database. Multiple hedge funds can target the same firm during one activism campaign. Double counting those hedge fund events in the same campaign will underestimate the impact of hedge fund activism on the change of employee's view on the target firm because the later events most likely will have less impact on the change than the first event will. Hedge fund activism campaigns can take one to three years to complete(Aslan, 2021). The average length of activism in Bebchuk et al. (2015) is about two years. Thus, to reduce double counting, for a particular target firm, if an activism event takes place within 24 months of another activism event, both events are put into the same event cluster. In this study, I consider one event cluster as equivalent to one hedge fund activism campaign. An event cluster can consist of more than two activism events if the time spacing of more than two events is less than or equal to 24 months. After clustering, 1078 hedge fund activism event

clusters are formed, out of which 518 event clusters happen to a firm after the firm enters the Glassdoor database. In Panel A and Panel B of Table B.2, the number of hedge fund events and event clusters are listed by year. Hedge funds tend to target small firms (Brav et al., 2008b) due to the high cost of purchasing enough shares for large firms. Large firms tend to appear in the Glassdoor database earlier than small firms due to the sheer difference in number of employees who can potentially write reviews on Glassdoor. Due to this size effect, and the fact that more firms entered the Glassdoor database as time progresses, the proportion of events (event clusters) out of the total number of events (event clusters) gets larger. However, only half of the events (event clusters) happen to a firm after the firm enters the Glassdoor database. Even more challenging, due to data sparsity in the Glassdoor database, as shown in the Panel C of Table B.2, only a very small portion of target firms have valid average review scores in the month when the hedge fund activism campaign take place. Only 20% of the event clusters happen to firms having valid average CEO approval rating scores, with 25% for the Job recommendation rating. And, a similar portion of event clusters happen to firms having valid average score for business outlook rating, and compensation & benefits rating, recognizing that the last two ratings score appear only after 2012 in the Glassdoor database.

The details of how the hedge fund activism data is collected and processed are described in Brav et al. (2008). Here, I outline some details of their procedure. Under section 13(d) of the 1934 Exchange Act, an investor is required to file form 13D or 13G with the SEC, to disclose his position in a public traded firm within 10 days of acquiring 5% or more of any class of securities of the firm. If the investor plans to influence the management of the firm, he is required to file form 13D. In form 13D, the investor is

required to disclose the number of shares and percentage of the ownership. The investor is also required to disclose the purpose of acquiring such a position in Item 4 of form 13D. Most of the hedge fund activism events (1157 events out of 1289) are identified through the 13D filing, while 132 events are identified through news search. A small portion of hedge fund activism events (40 events) is carried out without the activists crossing the 5% threshold. A hedge fund activist can engage in negotiation with the management of a target firm before the filing of a 13D, or even before the activist amasses a stake of 5% in the firm's stock. Thus, the date the activist launches the activism can be earlier than the 13D filing date. In 132 events, activists launched the activism before they filed the 13D form while, in 70 events, activists launched the activism before they amassed a stake of 5% in the target firm's stock.

2.3 Other data source

Firm accounting data was obtained from annual Compustat, analyst coverage was obtained from I.B.E.S and institutional ownership was obtained from Thomson Reuter. Firm characteristics are constructed from the aforementioned data on an annual basis. Six observations were discarded because of extreme values in sales growth. The summary statistics of firm characteristics are presented in Table B.1 Panel D

3. METHOD

3.1 Probability model and logit of propensity score

Probit is used to model the probability of a firm being targeted by a hedge fund during a one-year period. The one-year period starts on the first day of each calendar year and ends at the end of the year inclusively.

$$P(activism|X_i) = \beta X_i + \gamma T_t$$

X_i is the firm characteristics including firm industry classification indicators.T_t is the year indicator for year t effect. I denote $q(X_i)$ as the logit (log odds ratio of the probability a firm being targeted by a hedge fund for a particular year). Following Rosenbaum and Rubin (1985), the logit of the propensity score is used in the subsequent nearest neighbor matching, instead of the propensity score itself. Logit of the propensity score can prevents compression of propensity scores near zero and one.

The same firm characteristic variables as in Brav et al. (2008) are included as the determinants of the probability model. Those firm characteristics are: market capitalization, Tobin's q, gross sales growth rate, return on assets, leverage, dividend yield, research and development scaled by total assets, Herfindahl-Hirschman index of sales in different business segments, analyst coverage and institutional ownership. Detailed definitions of those firm characteristic variables are provided in Appendix D. In addition to the firm characteristic variables used in Brav et al. (2008), I add year effect and Fama-French 10 industry classification as an industry effect. For missing values of Herfindahl-Hirschman index of sales in different business segments, I set the Herfindahl-Hirschman index to 1 and added an additional variable to indicate whether the Herfindahl-Hirschman index of sales is missing. For research and development, I set the variable to zero if the value is missing.

The firm characteristics X_i at the start of each calendar year are approximated by the values of the most recent available data in the previous calendar year in Compustat. The logit of the propensity score $q(X_i)$ is computed at the beginning of each year and will serve as one of the matching variables in subsequent nearest-neighbor matching for a hedge fund activism campaign in the same calendar year.

3.2 Genetic Matching with a generalized Mahalanobis distance based on both the logit of the propensity score and firm characteristics, within a caliper of the logit of the propensity score

In this paper, I study the changes of employees' views on firms before and after hedge fund activism campaigns. Let $\Delta R^1_{i,s,t}$ be the rating change from time s to time t if a firm is targeted and $\Delta R^0_{i,s,t}$be the rating change within the same time period if the firm is not targeted. Let D_i be the indicator function indicating whether a firm is targeted by a hedge fund during a certain period, where $D_i = 1$ means the firm is targeted. The object of this study is to evaluate $E\left[\Delta R^1_{i,s,t} - \Delta R^0_{i,s,t} | D_i = 1\right]$, which is the average treatment effect on the treated.

Note that $E\left[\Delta R^0_{i,s,t} | D_i = 1\right]$ is not observable. When $\left(\Delta R^0_{i,s,t}, \Delta R^1_{i,s,t}\right)$ and D_i are independent, $E\left[\Delta R^0_{i,s,t} | D_i = 1\right]$ can be substituted by $E\left[\Delta R^0_{i,s,t} | D_i = 0\right]$,which is observable. However, when $\left(\Delta R^0_{i,s,t}, \Delta R^1_{i,s,t}\right)$ and D_i are not independent, $E\left[\Delta R^0_{i,s,t} | D_i = 1\right]$ is not necessary equal to $E\left[\Delta R^0_{i,s,t} | D_i = 0\right]$. This inequality is the source of selection bias. In my case, common factors can both affect the decision of a hedge fund to target a firm and affect the employees' view of the same firm, thus making $\left(\Delta R^0_{i,s,t}, \Delta R^1_{i,s,t}\right)$ and D_i not independent. Directly estimating $E\left[\Delta R^0_{i,s,t} | D_i = 1\right]$ with $E\left[\Delta R^0_{i,s,t} | D_i = 0\right]$ will introduce selection bias. To estimate the unobservable $E\left[\Delta R^0_{i,s,t} | D_i = 1\right]$, one needs some observable. If one can find some variables, say Y_i, making $\left(\Delta R^0_{i,s,t}, \Delta R^1_{i,s,t}\right)$ and D_i conditionally independent, conditioned on Y_i, namely $\left(\Delta R^0_{i,s,t}, \Delta R^1_{i,s,t}\right) \perp D_i | Y_i$, then $E\left[\Delta R^0_{i,s,t} | D_i = 1, Y_i\right]$ will be equal to $E\left[\Delta R^0_{i,s,t} | D_i = 0, Y_i\right]$ .Now, $E\left[\Delta R^0_{i,s,t} | D_i = 1\right] = E\left[E\left[\Delta R^0_{i,s,t} | D_i = 1, Y_i\right] | D_i = 1\right] = E\left[E\left[\Delta R^0_{i,s,t} | D_i = 0, Y_i\right] | D_i = 1\right]$ .Thus one only need

estimate $E\left[\Delta R_{i,s,t}^{0}|D_i = 0, Y_i\right]$, which is an observable. Nearest neighbor matching is one such method to estimate $E\left[\Delta R_{i,s,t}^{0}|D_i = 0, Y_i\right]$. In nearest neighbor matching, for each subject in the treatment group, one finds M number of subjects in the control group sufficiently similar to the treated subjects. The average outcome of the matched control subjects is viewed as an approximation of $E\left[\Delta R_{i,s,t}^{0}|D_i = 0, Y_i\right]$. When M=1, the matching is called 1-to-1. To measure the similarity between subjects in the control and subjects in treatment groups, a distance is introduced. When the distance is propensity score, or logit of the propensity score, it is called propensity score matching.

In practice, when the average treatment effect on the treated is estimated by nearest neighbor matching, one has to make sure that the subjects in the control group are sufficiently similar to those in the treatment group, to exclude the possibility that the subsequently estimated average treatment effect is caused by the dissimilarity between the control group and treatment group. When the control group is sufficiently similar, balance is achieved. Univariate t-test and Kolmogorov-Smirnov test are the main two tests to check whether balance is achieved. Propensity score matching is the main, and most important, method of nearest neighbor matching. It reduces the dimension of nearest neighbor matching to just one. With a correctly specified and appropriately estimated propensity score, one can achieve balance on covariates, in theory (Diamond and Sekhon, 2012). However, with data limitations and an unknown actual probability model, a misspecified and poorly estimated propensity score is very likely obtained. A misspecified and poorly estimated propensity score function can make it difficult to achieve balance. Rosenbaum and Rubin,(1985) have suggested a nearest available Mahalanobis metric matching within a caliper defined by the propensity score. In Mahalonobis metric matching, within a caliper

of propensity score, for a particular treated subject, one only considers control group subjects that are within a certain radius of propensity score from the particular treated subject. This radius is called the caliper of the propensity score, and Mahalonobis distance on logit of propensity score and other matching variables are then used to find matches within this radius. Rosenbaum and Rubin, (1985) show that the aforementioned matching is superior to propensity score matching in terms of achieving balance. Diamond and Sekhon, (2012) proposed Genetic Matching where they generalized the Mahalonobis distance with a diagonal weight matrix W:

$$\text{generalized Mahalonobios distance}(X_i, X_j) = \sqrt{(X_i - X_j)\Sigma^{1/2} W \Sigma^{1/2}(X_i - X_j)}$$

Then, the Genetic Algorithm is used to find the optimal diagonal weight matrix W. They show that Genetic Matching significantly improves balance.

In this study, I use the Genetic Matching with a caliper of logit of the propensity score. The matching variables are the logit of the propensity score, sales growth, and analyst coverage. I require firms in the control group to be from firms not targeted by any hedge fund during the study period. I also require that the matched control firm is in the same industry of the Fama-French 10 industry classification, and that both the target and matched control firm have Glassdoor rating data available before and after the activism campaign. A one-to-one match is conducted with replacement. The requirement of same industry and rating data availability in the glass door database can eliminate possible industry effects, seasonal rating changes and effects of macroeconomic events such as the financial crisis.

It is a standard approach, used by Rosenbaum and Rubin (1985), to include part of firm characteristic variables, namely: sales growth, analyst coverage and industry

classification, as matching variables in addition to the logit of the propensity score. Such an approach can be justified by the balancing score argument of Rosenbaum and Rubin, (1983). However, including rating data availability in the Glassdoor database as a matching variable needs further justification, because the data availability does not serve as a determining factor in my propensity score model, and the rating data availability in the Glassdoor database can correlate with whether a firm is being targeted by a hedge fund. For example, a company with large employee size is likely to have an employee writing reviews on Glassdoor. The same company may have a relatively lower probability to be targeted because the large employee size may imply that the company also has a large market capitalization, which makes it difficult for a hedge fund to take a position sufficient to wage an activism campaign.

To justify adding data availability as an additional matching variable, two assumptions are needed. Let A_i denote the vector of rating data availability indicator function for a firm in each month. The first assumption is $\left(\Delta R^0_{i,s,t}\ ,\ \Delta R^1_{i,s,t}\right) \perp D_i|(X_i\ , A_i)$, which is that the Glassdoor rating changes $\left(\Delta R^0_{i,s,t}\ ,\ \Delta R^1_{i,s,t}\right)$ are conditionally independent of whether a firm is targeted by a hedge fund, conditioned on the firm characteristic's variables X_i and the rating data availability in the Glassdoor database A_i. The second assumption is $A_i \perp D_i|\ X_i$, which is that the rating data availability in Glassdoor database A_i is conditionally independent of whether a firm is targeted by a hedge fund, conditioned on the firm characteristic variables X_i. The first assumption is the main part of the standard strong ignorability assumption while the second assumption makes $P[D_i = 1|X_i\ , A_i] = P[D_i = 1|X_i\ ]$ and, consequently, makes the vector of my matching variables: logit of the propensity score $q(X_i)$, sales growth, analyst coverage, industry classification and data

availability A_i, a balancing score in the sense of Rosenbaum and Rubin (1983). Thus, this makes the method I use a valid nearest neighbor matching procedure.

4. EMPIRICAL RESULTS

4.1 Propensity score and probit result

The probit model is fitted on hedge fund activism campaigns spanning from 2008 to 2014, with firm characteristics data spanning from 2007 to 2013. The data are restricted to the data from firms appearing in the Glassdoor database. The probit regression result is presented in Table B.3. The findings are very similar to the findings of Brav et al. (2008). Hedge funds tend to target firms with smaller market capitalization. They are also looking for firms that are relatively undervalued in terms of Tobin's Q, firms that are relatively more profitable in terms of return on assets and firms with less concentrated business in a particular industry. They also like firms with more analyst coverage and more institutional ownership. Chen and Shohfi (2021) show that hedge funds can use sell-side analyst analyses as evidence to wage an activism campaign against a target firm. More institutional ownership means potential help from other shareholders. Differently from Brav et al. (2008), I find that hedge funds like firms with relatively higher research and development spending. My finding is consistent with Brav et al.'s (2018) finding that hedge fund activism improves research efficiency by decreasing research spending while increasing innovation.

4.2 Balancing result for Genetic Matching with distance based both on the logit of the propensity score sales growth and analyst coverage

Following Rosenbaum and Rubin (1985), the caliper for all matchings are set to 0.25 of the pooled standard deviation of the logit of the propensity score. All the continuous

variables in firm characteristics, the X_i, are used to measure whether balance is achieved. Paired t-tests are used to check whether all the continuous firm characteristic variables of the treatment group are similar with the ones in the control group. In Table D.1 of Appendix D, results for nearest neighbor matchings with only the logit of the propensity score show that a significant portion of the matchings are unbalanced, with some continuous firm characteristics of subjects in the treatment group being statistically significantly different from the ones of the matched subjects in the control group. This dissimilarity will make the subsequent causal inference invalid. In Table B.4, after introducing genetic matching and additional matching variables of sales growth and analyst coverage, all of the matchings achieve balance.

4.3 Results for the impact of hedge fund activism on target firm and its employees in the eyes of the employees

The management or employees of the target firm may have some knowledge of the pending hedge fund activism campaign before the filing of a 13D form. Brav et al. (2008) show that abnormal price movement happen before the filing date of 13D forms. Chabakauri et al.(2022) also show that management is informed of a pending hedge fund activism campaign before the hedge fund actually starts to purchase a large number of shares in the company. Since most of the event clusters in this study are identified through the filing of a 13D, it is thus reasonable to exclude the ratings in the month the hedge fund activism event cluster starts, and the month before the event cluster takes place, to reduce complications caused by possible information leakage. The ratings of the firms before the hedge fund activism is approximated by average ratings of the 6-month period ending at month $m-2$, where m is the month the hedge fund activism event cluster starts. The

length of a hedge fund activism campaign can range from one to three years. The sample in Bebchuk et al. (2015) has an average holding period of two years, with median holding length of one and a half years. Average treatment effect on the treated (ATT) of the rating changes are estimated for each six months for three years after the hedge fund activism campaign takes place. Table B.4 presents the ATT results for changes of business outlook rating, job recommendation probability, career and opportunity, and compensation and benefits.

Prior research showed operational performance of target firms improves after hedge fund activism. Are those operational metrics good indicators for the impact of hedge fund activism? Employees of firms are people most familiar with the firms' business. The view of the employees on the firms' business outlook is a good indicator of whether changes pushed by the hedge fund activists are beneficial to target firms or not. From Panel A of Table B.4, this is clearly not the case. At least there is no significant improvement in the business outlook for the entire three-year period starting from the initiation of the hedge fund activism campaign, noticing that most of the hedge fund activism probably has already ended after 3 years. In contrast, the business outlook for the second and fourth six-month periods after the hedge fund activism is significantly lower than the business outlook before the hedge fund activism campaign. This is more consistent with the theory that hedge fund activism is detrimental to target firms in the long term. This is hardly surprising because hedge funds may well be oriented toward improving highly visible operational metrics while leaving other not highly visible metrics, such as the value of human capital deteriorating, impairing the long-term outlook of the business.

Furthermore, hedge fund activists raid the cashholdings of target firms by increasing payout to shareholders, decreasing capital expenditure, divesting business and laying off workers. With decreased capital expenditure and sales of the business, opportunities within the business are reduced. Thus, it is plausible to assume that employees may feel careers and opportunities within a target firm are reduced. However, for the current employees of a target firm, who are the survivors of the layoffs and business divesture, one may feel positive about the prospects of their future career in the target firm, because changes pushed by the hedge fund activists may improve the long-term prospects of the target firm. Do current employees actually feel positive about their future career in target firms after the hedge fund activism? As shown in Panel C of Table B.4, there is no statistically significant positive change in the careers and opportunities during the entire 3-year period starting from the initiation of the hedge fund activism campaign. On the contrary, in the second and fourth 6-month period, a significant reduction of career and opportunities within the firm is observed. Thus, hedge fund activism negatively impacts the employees' career and opportunity, both in the short and long-term. This negative impact can induce loss of valuable human capital as witnessed by Chen et al.(2021), and impair the long-term prospects of a target firm in an invisible way.

With business outlook diminished and career opportunities reduced, it is safe to assume that employees will not recommend their firms to a friend or a family member. As shown in Panel B of Table B.4, the job recommendation probability is statistically reduced in the second 6-month and fourth 6-month periods. This reduction confirms my findings on the business outlook and career and opportunities.

Prior research (Agrawal and Yuree, 2022; Brav et al., 2015b) showed that hedge fund activism transfers wealth from the employees of target firms, by wage stagnation and reduction in pension funding. Thus, it is reasonable that I should observe a reduction in compensation and benefits after the hedge fund activism compared to the matched non-target firms. However, as shown in Panel D of Table B.4, there is no significant reduction in the compensation and benefits during the entire 3-year period after hedge fund activism campaigns.

As a last remark, solution of the genetic algorithm is stochastic. Thus, Genetic Matching can produce a different result for each matching. In Appendix D, I append the results of two additional batches of matchings. Both produced similar results.

5. CONCLUSION

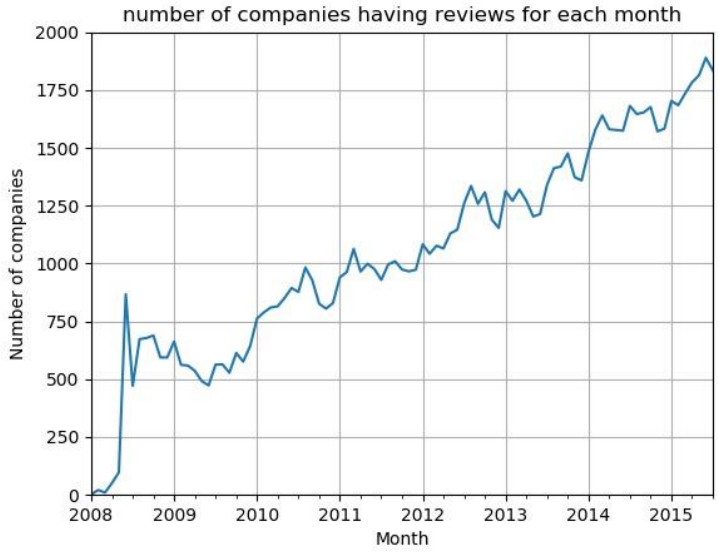
Hedge fund activism has become more and more popular in recent years. The industry has grown many fold since 2001. While the industry grows, hedge fund activism becomes important both to financial markets and to policy makers. A large portion of the research has focused on the impact of hedge fund activism on the performance of a target firm and its shareholders, while a small portion of research focused on the other stakeholders of a target firm, with a very few focusing on the impact on the human capital of a target firm. In this study, I investigated the impact of hedge fund activism on the business prospects and on the employees of a target firm. I take advantage of the emergence of websites where employees can take an anonymous survey about the firms they are working in or have worked for. In particular, I investigated the reviews written by employees on the Glassdoor website. Those reviews contain information processed and synthesized by the employees, who are insiders of the firms. Such processed information

can contain useful information about the impact of hedge fund activism on target firms and on their employees. Using genetic matching, I find that the business outlook of target firms diminishes compared to a matched non-target firm. This finding of the impact on target firms is in direct contrast to earlier research showing that both target firms' value and target firms' operational performance improves after hedge fund activism campaigns. However, this difference between my findings and earlier findings can be potentially reconciled if the hedge fund activists manage to improve the value of highly visible assets of a target firm, at the cost of reducing the value of not easily visible assets of the target firm. I also investigated the impact on the employees of a target firm by hedge fund activism. I find that current employees' careers and opportunities within a target firm are reduced within 2 years after a hedge fund activism campaign. This reduction of career and opportunity may induce a loss of valuable human capital, thus reducing firm value in not easily visible ways.

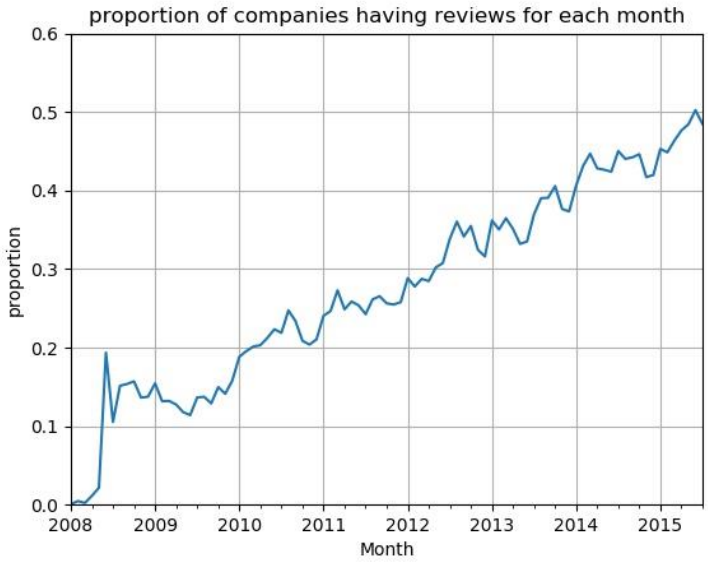
APPENDICES

APPENDIX A FIGURES AND TABLES FOR CHAPTER 1

Figure A.1 Number and proportion of domestic companies having reviews for each month



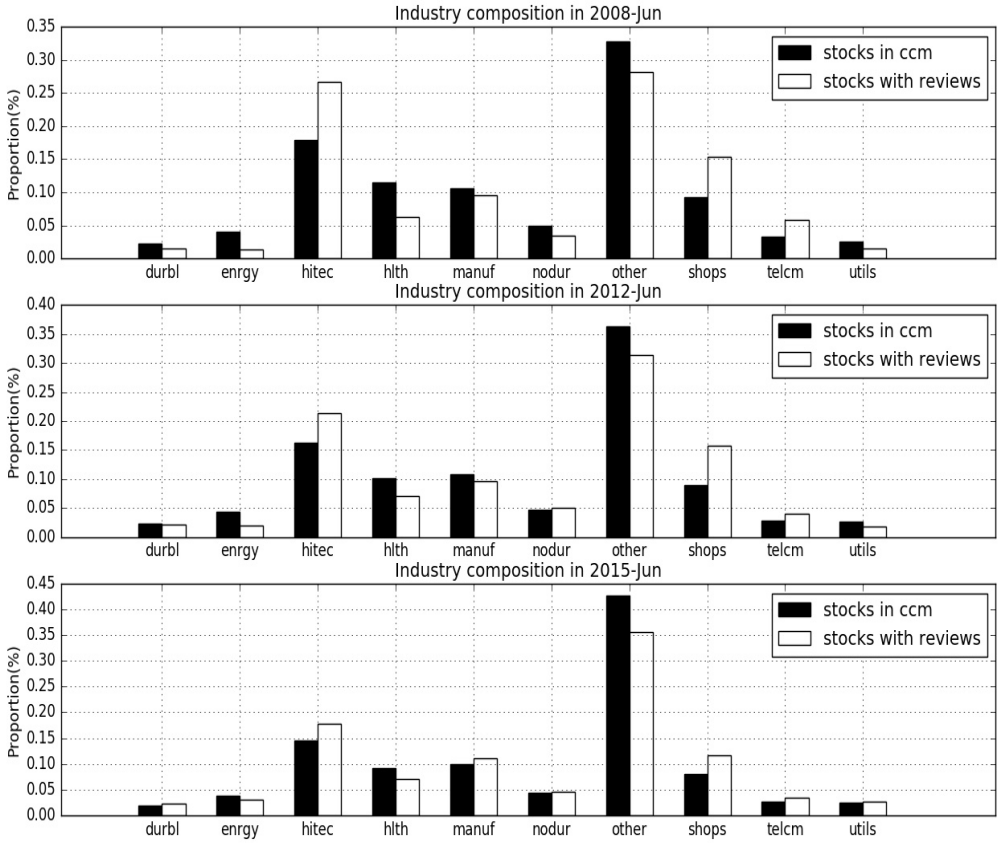
(a)



(b)

Domestic companies only include companies with common stock listed on NYSE, NASDAQ, and AMEX

Figure A.2 Industry composition of domestic firms having reviews in June 2008, June 2012, and June 2015



Domestic firms include domestic firms with common stock listed on NYSE, NASDAQ, AMEX of CCM database. The Fama-French 10-industry definition is used

Table A.1 Comparative statistics between domestic firms in Glassdoor and domestic firms on NYSE, NASDAQ, and AMEX

This table reports the comparative statistics between domestic firms in Glassdoor and all domestic firms in CCM listed on NYSE, NASDAQ, and AMEX. The data for descriptive statistics of firms in Glassdoor database are included only after firms entering the Glassdoor database. BM is the book-to-market ratio. Profit margin is net income divided by revenue. ME is the market capitalization. Market capitalization is stock price times shares outstanding. Research and development is research and development divided by lagged asset. Research and development is set to zero if missing, long term debt is long term debt divided by lagged asset. MOM is momentum. R is the monthly stock return. Tvol 6M is the past 6 month daily total stock return volatility. Tvol 12M is the past 12 months daily total stock return volatility. Ivol 6M is the daily idiosyncratic volatility. Ivol 12M is the past 12 months idiosyncratic volatility.

	in Glassdoor			all		
Variables	mean	median	std	mean	median	std
BM	0.85	0.57	2.45	0.98	0.64	3.00
ln(BM)	-0.63	-0.56	0.92	-0.53	-0.44	0.97
ME (In Millions)	6344.29	943.36	23216.44	4135.41	409.26	18449.20
ln(ME)	6.86	6.85	1.97	6.07	6.01	2.12
profit margin	-0.91	0.04	19.16	-1.87	0.04	26.44
research and development	0.05	0.00	0.12	0.05	0.00	0.15
investment	0.04	0.03	0.06	0.05	0.02	0.09
long term debt	0.20	0.13	0.28	0.18	0.10	0.28
MOM	18.20%	11.30%	63.00%	17.30%	9.20%	77.00%
R	1.30%	0.90%	16.00%	1.00%	0.40%	18.00%
6M tvol	2.90%	2.40%	2.00%	3.50%	2.80%	3.00%
12m tvol	3.00%	2.50%	2.00%	3.50%	2.90%	3.00%
6m ivol	2.40%	1.90%	2.00%	3.00%	2.30%	3.00%
12m ivol	2.40%	2.00%	2.00%	3.10%	2.40%	3.00%

Table A.2 Descriptive statistics for overall score and job recommendation score

Panel A descriptive statistics for scores

	Nobs	mean	median	std
overall score	719689	3.19	3.00	1.23
job recommendation score	596502	1.42	1.00	0.49

Panel B correlation between scores

	overall score	job recommendation score
overall score	1.00	-0.77
job recommendation score	-0.77	1.00

Table A.3 Monthly four-factor alphas of level portfolios

Panels in this table reports the alphas after adjusting risk with Fama-French-Carhart four-factor model for level portfolios. A level portfolio of overall score (job recommendation score) consists of firms with scores at the top(bottom) quartile.

Panel A: Level portfolio based on job recommendation

look-back period	holding period 1	2	3	6	9	12	18	24
3	0.198*	0.166	0.182*	0.178*	0.171*	0.195**	0.214**	0.233**
	(1.83)	(1.54)	(1.68)	(1.84)	(1.79)	(2.07)	(2.34)	(2.56)
4	0.152	0.146	0.169	0.167	0.171*	0.201**	0.219**	0.236**
	(1.29)	(1.27)	(1.48)	(1.65)	(1.77)	(2.13)	(2.38)	(2.57)
5	0.0877	0.148	0.154	0.14	0.142	0.18*	0.203**	0.224**
	(0.76)	(1.3)	(1.35)	(1.41)	(1.53)	(1.97)	(2.27)	(2.5)
6	0.156	0.177	0.173	0.159*	0.177*	0.207**	0.223**	0.244***
	(1.4)	(1.63)	(1.63)	(1.71)	(1.96)	(2.36)	(2.57)	(2.79)
7	0.168	0.172*	0.159	0.159*	0.184**	0.208**	0.228***	0.249***
	(1.54)	(1.67)	(1.55)	(1.76)	(2.11)	(2.42)	(2.69)	(2.91)
8	0.165	0.165*	0.171*	0.166*	0.192**	0.209**	0.233***	0.252***
	(1.63)	(1.68)	(1.75)	(1.91)	(2.24)	(2.47)	(2.79)	(2.98)
9	0.152	0.177*	0.186*	0.176**	0.2**	0.217**	0.241***	0.255***
	(1.54)	(1.81)	(1.92)	(2.06)	(2.36)	(2.58)	(2.88)	(3.02)
10	0.178*	0.189*	0.184*	0.175**	0.194**	0.21**	0.239***	0.253***
	(1.8)	(1.96)	(1.9)	(2.06)	(2.3)	(2.49)	(2.86)	(2.98)
11	0.173*	0.175*	0.184*	0.184**	0.195**	0.215**	0.249***	0.259***
	(1.83)	(1.85)	(1.95)	(2.15)	(2.31)	(2.56)	(3)	(3.06)
12	0.175*	0.191**	0.191**	0.195**	0.208**	0.225***	0.26***	0.266***
	(1.82)	(2.06)	(2.02)	(2.25)	(2.43)	(2.65)	(3.11)	(3.13)
13	0.176*	0.191**	0.19*	0.194**	0.212**	0.231***	0.261***	0.265***
	(1.9)	(2.03)	(1.98)	(2.21)	(2.47)	(2.71)	(3.1)	(3.1)
14	0.174*	0.189*	0.187*	0.197**	0.221**	0.237***	0.265***	0.269***
	(1.74)	(1.91)	(1.87)	(2.2)	(2.52)	(2.74)	(3.12)	(3.13)
15	0.192*	0.2**	0.203**	0.203**	0.22**	0.24***	0.266***	0.269***
	(1.91)	(2.01)	(2.02)	(2.26)	(2.51)	(2.78)	(3.12)	(3.13)
16	0.185*	0.201**	0.201**	0.204**	0.223**	0.243***	0.264***	0.269***
	(1.88)	(2.03)	(2.01)	(2.27)	(2.54)	(2.8)	(3.11)	(3.12)
17	0.198*	0.187*	0.193*	0.205**	0.228**	0.25***	0.265***	0.27***
	(1.9)	(1.85)	(1.92)	(2.27)	(2.59)	(2.88)	(3.11)	(3.13)
18	0.189*	0.185*	0.189*	0.207**	0.236***	0.252***	0.264***	0.27***
	(1.83)	(1.85)	(1.9)	(2.33)	(2.71)	(2.94)	(3.11)	(3.15)

Table A.3 (cont'd)
Panel B: Level portfolio based on overall score

Look-back period	holding period 1	2	3	6	9	12	18	24
3	0.208*	0.18	0.161	0.182*	0.188*	0.197**	0.216**	0.228**
	(1.9)	(1.64)	(1.46)	(1.74)	(1.83)	(2)	(2.27)	(2.43)
4	0.0956	0.117	0.126	0.155	0.171*	0.19*	0.206**	0.22**
	(0.877)	(1.06)	(1.17)	(1.47)	(1.71)	(1.97)	(2.21)	(2.37)
5	0.125	0.153	0.149	0.162	0.177*	0.195**	0.212**	0.225**
	(1.15)	(1.42)	(1.37)	(1.53)	(1.8)	(2.06)	(2.31)	(2.46)
6	0.153	0.151	0.154	0.171*	0.192**	0.201**	0.212**	0.231**
	(1.45)	(1.47)	(1.46)	(1.68)	(2.01)	(2.2)	(2.4)	(2.61)
7	0.13	0.136	0.151	0.178*	0.195**	0.198**	0.213**	0.232***
	(1.24)	(1.33)	(1.44)	(1.82)	(2.1)	(2.2)	(2.46)	(2.67)
8	0.134	0.156	0.17*	0.188**	0.206**	0.206**	0.222**	0.24***
	(1.37)	(1.6)	(1.67)	(2)	(2.31)	(2.35)	(2.6)	(2.81)
9	0.143	0.161*	0.168*	0.181**	0.204**	0.204**	0.221**	0.232***
	(1.5)	(1.68)	(1.72)	(2)	(2.34)	(2.36)	(2.62)	(2.74)
10	0.13	0.149	0.153	0.188**	0.207**	0.208**	0.225***	0.234***
	(1.41)	(1.62)	(1.61)	(2.1)	(2.37)	(2.4)	(2.67)	(2.76)
11	0.137	0.152*	0.168*	0.194**	0.211**	0.218**	0.237***	0.24***
	(1.6)	(1.72)	(1.82)	(2.18)	(2.43)	(2.53)	(2.81)	(2.84)
12	0.14	0.174*	0.181*	0.208**	0.227**	0.232***	0.251***	0.251***
	(1.61)	(1.95)	(1.93)	(2.3)	(2.58)	(2.67)	(2.97)	(2.94)
13	0.152*	0.174*	0.191**	0.219**	0.239***	0.242***	0.255***	0.251***
	(1.77)	(1.94)	(2.01)	(2.4)	(2.69)	(2.75)	(2.99)	(2.93)
14	0.146	0.192**	0.2**	0.228**	0.247***	0.247***	0.258***	0.254***
	(1.61)	(2.05)	(2.06)	(2.45)	(2.73)	(2.78)	(2.99)	(2.94)
15	0.181**	0.21**	0.214**	0.233**	0.249***	0.252***	0.261***	0.257***
	(2)	(2.23)	(2.21)	(2.5)	(2.76)	(2.84)	(3.02)	(2.97)
16	0.18*	0.207**	0.215**	0.231**	0.248***	0.25***	0.259***	0.255***
	(1.96)	(2.21)	(2.2)	(2.48)	(2.73)	(2.81)	(3)	(2.95)
17	0.196**	0.21**	0.213**	0.228**	0.249***	0.252***	0.255***	0.251***
	(2.08)	(2.21)	(2.19)	(2.45)	(2.76)	(2.84)	(2.95)	(2.91)
18	0.191**	0.207**	0.209**	0.227**	0.251***	0.249***	0.249***	0.246***
	(2.05)	(2.2)	(2.17)	(2.46)	(2.83)	(2.84)	(2.9)	(2.87)

*,**,*** indicate statistical significance at 10%,5%,1%

Table A.4 Monthly four-factor alphas of declining-improving portfolios

Panels in this table report the alphas after adjusting risk with Fama-French-Carhart four-factor model for declining-improving portfolios. A declining-improving portfolio for change of overall score (job recommendation score) is constructed by longing a portfolio of firms with score changes in bottom(top) quartile and shorting a portfolio of firms with score changes in a top(bottom) quartile score

Panel A: Declining-improving portfolio based on job recommendation score change

		holding period							
		1	2	3	6	9	12	18	24
Look-back period	3	0.0464	0.167	0.211*	0.145	0.177**	0.158**	0.11*	0.122**
		(0.324)	(1.28)	(1.76)	(1.54)	(2.4)	(2.49)	(1.78)	(2.04)
	4	0.131	0.145	0.16	0.16	0.156*	0.157**	0.115	0.135*
		(0.861)	(1.01)	(1.19)	(1.47)	(1.92)	(2.12)	(1.62)	(1.98)
	5	0.262*	0.235	0.219	0.219*	0.238***	0.211**	0.199***	0.196***
		(1.78)	(1.64)	(1.58)	(1.91)	(2.81)	(2.62)	(2.65)	(2.65)
	6	0.365**	0.346**	0.317**	0.378***	0.339***	0.285***	0.271***	0.264***
		(2.29)	(2.07)	(2.09)	(3.19)	(3.4)	(2.9)	(2.94)	(2.86)
	7	0.267	0.397**	0.422***	0.423***	0.37***	0.318***	0.318***	0.305***
		(1.58)	(2.56)	(2.96)	(3.56)	(3.17)	(2.81)	(3.07)	(2.94)
	8	0.265**	0.335***	0.362***	0.313***	0.265***	0.211***	0.206***	0.185***
		(2.15)	(3.02)	(3.47)	(3.3)	(2.98)	(2.64)	(3.17)	(2.96)
	9	0.303**	0.327***	0.365***	0.309***	0.247***	0.219***	0.188***	0.168***
		(2.59)	(3.35)	(3.75)	(3.29)	(2.9)	(2.86)	(2.91)	(2.82)
	10	0.325***	0.344***	0.337***	0.294***	0.229**	0.197**	0.155*	0.121
		(3.13)	(3.36)	(3.27)	(3.07)	(2.47)	(2.3)	(1.97)	(1.65)
	11	0.217**	0.215*	0.194*	0.192*	0.136	0.116	0.0896	0.0565
		(2.09)	(1.84)	(1.71)	(1.77)	(1.3)	(1.15)	(0.93)	(0.628)
	12	0.222*	0.233**	0.252**	0.208**	0.185*	0.159	0.113	0.0794
		(1.82)	(2.11)	(2.39)	(2.05)	(1.85)	(1.66)	(1.26)	(0.969)
	13	0.277**	0.272**	0.236**	0.176	0.184*	0.156	0.101	0.0693
		(2.13)	(2.42)	(2.16)	(1.65)	(1.75)	(1.52)	(1.08)	(0.805)
	14	0.173*	0.164*	0.167*	0.17*	0.185*	0.183*	0.132	0.103
		(1.71)	(1.75)	(1.73)	(1.77)	(1.9)	(1.9)	(1.46)	(1.26)
	15	0.186*	0.144	0.16*	0.147	0.158*	0.115	0.0753	0.0541
		(1.73)	(1.62)	(1.75)	(1.56)	(1.72)	(1.36)	(0.955)	(0.748)
	16	0.161	0.122	0.0959	0.127	0.121	0.0729	0.0515	0.0182
		(1.27)	(1.18)	(0.87)	(1.2)	(1.17)	(0.729)	(0.538)	(0.21)
	17	0.162	0.0724	0.101	0.121	0.0911	0.049	0.0337	0.00404
		(1.28)	(0.654)	(0.908)	(1.13)	(0.867)	(0.487)	(0.35)	(0.044)
	18	0.0705	0.0958	0.138	0.122	0.0709	0.0575	0.0362	0.00957
		(0.509)	(0.82)	(1.12)	(1.05)	(0.616)	(0.518)	(0.342)	(0.0935)

Table A.4 (cont'd)

Panel B: Declining-improving portfolio based on overall score change

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.185	-0.108	0.0688	0.0494	0.0472	0.0368	-0.00468	0.0169
	(-1.11)	(-0.756)	(0.529)	(0.495)	(0.52)	(0.41)	(-0.0539)	(0.195)
4	0.0891	0.152	0.13	0.113	0.116	0.127	0.0771	0.113
	(0.589)	(1.08)	(0.925)	(0.991)	(1.14)	(1.31)	(0.817)	(1.2)
5	0.304**	0.205	0.237*	0.186*	0.174*	0.162*	0.163*	0.181**
	(2.02)	(1.49)	(1.77)	(1.69)	(1.81)	(1.75)	(1.87)	(2.11)
6	0.359**	0.291**	0.272**	0.215**	0.201**	0.17*	0.183**	0.188**
	(2.29)	(2.29)	(2.3)	(2.21)	(2.15)	(1.88)	(2.26)	(2.32)
7	0.204	0.344**	0.37***	0.314***	0.281**	0.236**	0.27**	0.245**
	(1.38)	(2.57)	(3.15)	(2.8)	(2.47)	(2.12)	(2.64)	(2.4)
8	0.222*	0.287***	0.276**	0.225**	0.187*	0.158*	0.19**	0.167**
	(1.83)	(2.68)	(2.57)	(2.3)	(1.99)	(1.82)	(2.49)	(2.27)
9	0.297**	0.264**	0.264**	0.236**	0.217**	0.187**	0.184**	0.161**
	(2.51)	(2.36)	(2.49)	(2.45)	(2.27)	(2.05)	(2.26)	(2.08)
10	0.225**	0.215**	0.222**	0.208**	0.143	0.131	0.105	0.0856
	(2.03)	(2.03)	(2.06)	(2.02)	(1.38)	(1.36)	(1.22)	(1.1)
11	0.271**	0.238*	0.183	0.215*	0.158	0.131	0.113	0.101
	(2.33)	(1.95)	(1.56)	(1.88)	(1.4)	(1.24)	(1.16)	(1.15)
12	0.182	0.217*	0.185	0.176	0.124	0.0994	0.0801	0.0737
	(1.48)	(1.76)	(1.49)	(1.46)	(1.09)	(0.971)	(0.851)	(0.848)
13	0.225	0.208	0.201	0.126	0.106	0.0769	0.0602	0.0524
	(1.61)	(1.52)	(1.56)	(1.03)	(0.967)	(0.753)	(0.657)	(0.618)
14	0.347***	0.305**	0.284**	0.201*	0.186*	0.175*	0.152	0.147
	(2.69)	(2.51)	(2.44)	(1.77)	(1.73)	(1.67)	(1.58)	(1.62)
15	0.176	0.148	0.131	0.101	0.116	0.0969	0.0856	0.0827
	(1.49)	(1.38)	(1.18)	(0.878)	(1.05)	(0.898)	(0.837)	(0.854)
16	0.164	0.114	0.0843	0.0978	0.104	0.0654	0.0642	0.0535
	(1.28)	(0.94)	(0.633)	(0.777)	(0.864)	(0.566)	(0.585)	(0.507)
17	0.0805	0.0318	0.0428	0.0766	0.0931	0.0535	0.0615	0.0508
	(0.564)	(0.218)	(0.3)	(0.592)	(0.741)	(0.452)	(0.531)	(0.454)
18	-0.00952	-0.00872	0.0362	0.0613	0.0411	0.0186	0.0231	0.0116
	(-0.0546)	(-0.0561)	(0.234)	(0.426)	(0.289)	(0.134)	(0.171)	(0.0874)

*,**,*** indicate statistical significance at 10%,5%,1%

Table A.5 Fama-Macbeth result

Each month, excessive cumulative returns of the holding periods are regressed on the average score($\text{Score}^{i}_{t-\text{holding},t}$), change of the average score($\Delta\text{Score}^{i}_{t-\text{holding},t}$), logarithm of book to mark ratio ($\ln(\text{BM}^{i}_{t})$), logarithm of market capitalization($\ln(\text{ME}^{i}_{t})$), previous year momentum($\text{Mom}^{i}_{t-1,t-12}$), current month return($R^{i}_{t-1,t}$), idiosyncratic volatility($\text{ivol}^{i}_{t-1,t}$) and industry indicator. Newey-West variance is applied to reduce time serial correlation. The cross-sectional regression formula is:

$$re^{i}_{t,t+\text{holding}} = \alpha_t + \beta_t \text{Score}^{i}_{t-\text{holding},t} + \gamma_t \Delta\text{Score}^{i}_{t-\text{holding},t} + \theta_t \text{Mom}^{i}_{t-1,t-12} + \sigma_t R^{i}_{t-1,t} + \rho_t \ln(\text{ME}^{i}_{t}) + \rho_t \ln(\text{BM}^{i}_{t}) + \omega_t \text{ivol}^{i}_{t-1,t} + \text{industry} + \varepsilon^{i}_{t}$$

Panel A job recommendation score

Lookback Period \ Holding Period	1	2	3	6	9	12	18	24
3	-0.411*	-0.803**	-0.918*	-2.22***	-3.87**	-5.56**	-10.9**	-16**
	(-1.7)	(-2.03)	(-1.88)	(-2.75)	(-2.47)	(-2.44)	(-2.25)	(-2.06)
4	-0.572**	-0.901**	-1.47***	-3.5***	-5.07***	-6.85***	-12.6***	-18.2***
	(-2.4)	(-2.29)	(-2.79)	(-3.62)	(-3.51)	(-4.23)	(-3.47)	(-2.7)
5	-0.368*	-0.932**	-1.49**	-3.12***	-5.17***	-6.23***	-12.1***	-16.9**
	(-1.78)	(-2.13)	(-2.34)	(-2.59)	(-3.16)	(-3.88)	(-3.28)	(-2.55)
6	-0.543**	-1.25***	-1.97***	-4.01***	-5.59***	-6.36***	-11.6***	-16.3**
	(-2.43)	(-2.79)	(-2.8)	(-3.43)	(-3.9)	(-4.35)	(-3.01)	(-2.38)
7	-0.596***	-1.34***	-2.11***	-3.96***	-5.35***	-6.3***	-11.2***	-15**
	(-2.76)	(-2.77)	(-2.94)	(-3.81)	(-4.67)	(-4.41)	(-2.61)	(-2.19)
8	-0.63***	-1.37***	-2.04***	-3.48***	-4.83***	-6.26***	-11.2***	-14.6**
	(-2.87)	(-2.61)	(-3.02)	(-3.96)	(-5.05)	(-4.27)	(-2.78)	(-2.31)
9	-0.763**	-1.26***	-1.7***	-2.99***	-4.38***	-6.14***	-10.6**	-13.7**
	(-2.44)	(-2.59)	(-3.09)	(-4.11)	(-4.71)	(-3.51)	(-2.54)	(-2.27)
10	-0.54***	-0.981***	-1.43***	-2.62***	-4.2***	-6***	-9.59**	-12.2**
	(-2.93)	(-3.61)	(-4)	(-4.8)	(-4.16)	(-3.43)	(-2.56)	(-2.27)
11	-0.573***	-0.992***	-1.52***	-2.95***	-4.45***	-6.1***	-9.71***	-11.8**
	(-3.91)	(-4.2)	(-4.76)	(-4.8)	(-4.41)	(-3.66)	(-2.85)	(-2.51)
12	-0.617***	-1.05***	-1.53***	-2.92***	-4.46***	-5.98***	-9.13***	-10.9***
	(-4.66)	(-5.1)	(-5.2)	(-4.12)	(-4.05)	(-3.57)	(-2.78)	(-2.65)
13	-0.612***	-0.914***	-1.45***	-2.83***	-4.43***	-6.22***	-8.66***	-9.71***
	(-4.48)	(-3.67)	(-4.4)	(-4.02)	(-3.71)	(-3.38)	(-2.89)	(-2.81)
14	-0.51***	-0.961***	-1.55***	-3.14***	-4.54***	-6.78***	-8.72***	-9.12***
	(-3.53)	(-3.8)	(-4.73)	(-4.31)	(-3.34)	(-3.25)	(-3.02)	(-2.8)
15	-0.53***	-1.08***	-1.58***	-3.41***	-4.89***	-6.88***	-8.71***	-9.08***
	(-4.83)	(-4.69)	(-4.69)	(-4.25)	(-3.35)	(-3.17)	(-2.97)	(-2.76)
16	-0.617***	-1.13***	-1.77***	-3.54***	-5.42***	-7.25***	-9.12***	-9.74***
	(-5.22)	(-4.41)	(-5.07)	(-3.93)	(-3.43)	(-3.35)	(-3.2)	(-2.96)
17	-0.558***	-1.2***	-1.92***	-3.76***	-5.84***	-7.55***	-9.24***	-9.98***
	(-3.71)	(-4.96)	(-5.17)	(-3.96)	(-3.48)	(-3.58)	(-3.34)	(-3.1)
18	-0.638***	-1.38***	-2.13***	-3.93***	-5.81***	-7.53***	-9.03***	-10***
	(-4.47)	(-4.47)	(-4.58)	(-3.67)	(-3.41)	(-3.53)	(-3.52)	(-3.18)

Table A.5 (cont'd)
Panel B change of job recommendation score

Lookback period	Holding period 1	2	3	6	9	12	18	24
3	0.183	0.911**	1.39***	2.19***	3.54***	4.72**	9.18**	11.9*
	(0.632)	(2.2)	(2.84)	(3.38)	(2.69)	(2.28)	(2.55)	(1.79)
4	0.568**	0.962**	1.2***	2.86***	4.38***	6.89***	11.5**	15.6*
	(2.49)	(2.53)	(2.83)	(3.01)	(2.86)	(2.75)	(2.47)	(1.93)
5	0.286	0.796*	1.24**	2.46**	4.51***	6.9***	12.2**	14.7*
	(1.23)	(1.85)	(2.32)	(2.17)	(2.99)	(2.73)	(2.41)	(1.88)
6	0.517**	1.15***	1.7***	3.1***	4.82***	6.59***	11.6**	13.8*
	(2.22)	(3.06)	(3)	(3.66)	(3.17)	(2.86)	(2.07)	(1.84)
7	0.709***	1.72***	2.62***	4.22***	5.8***	6.8***	11.5**	14.2**
	(2.9)	(3.91)	(3.62)	(4.36)	(3.14)	(2.96)	(1.97)	(2.16)
8	0.802***	1.7***	2.46***	3.46***	5.1**	6.37**	11.2*	13.4**
	(4.79)	(4.35)	(4.37)	(3.56)	(2.57)	(2.36)	(1.92)	(2.14)
9	0.789***	1.49***	2.01***	2.88***	4.19**	5.69**	9.49*	11.7**
	(4.3)	(4.41)	(4.27)	(3)	(2.34)	(2.18)	(1.81)	(2.08)
10	0.717***	1.27***	1.75***	2.65***	3.92**	5.38**	8.11*	10.3**
	(3.69)	(4.02)	(3.96)	(2.75)	(2.4)	(2.17)	(1.79)	(2.02)
11	0.594***	1.02***	1.27***	2.57***	3.45**	4.94**	7.19*	8.61*
	(4.15)	(3.56)	(3.19)	(2.6)	(2.24)	(2.18)	(1.78)	(1.8)
12	0.55***	0.973***	1.46***	2.43**	3.45**	4.98**	6.67*	7.2*
	(4)	(4.37)	(4.26)	(2.43)	(2.14)	(2.24)	(1.76)	(1.68)
13	0.506***	0.894***	1.23***	2.01*	3.46**	4.99**	5.64	5.26
	(4.37)	(3.99)	(3.17)	(1.94)	(1.98)	(2.08)	(1.57)	(1.28)
14	0.416***	0.709**	1.12**	2.08*	3.48*	5*	5.47	4.19
	(3.11)	(2.52)	(2.39)	(1.87)	(1.85)	(1.86)	(1.51)	(1.02)
15	0.302**	0.625**	0.892*	2.32*	3.58*	4.54*	5.49	3.21
	(2.18)	(2.07)	(1.91)	(1.84)	(1.89)	(1.75)	(1.62)	(0.791)
16	0.322*	0.631*	0.86	2.43*	3.94*	4.39*	5.66	2.81
	(1.67)	(1.86)	(1.62)	(1.87)	(1.86)	(1.68)	(1.59)	(0.635)
17	0.32*	0.632	1.12*	2.53*	3.91*	4.46*	5.09	1.51
	(1.65)	(1.63)	(1.95)	(1.86)	(1.69)	(1.77)	(1.43)	(0.354)
18	0.384	0.842**	1.39**	2.49*	3.46	4.42	3.95	0.0209
	(1.52)	(1.98)	(2.01)	(1.65)	(1.42)	(1.6)	(1.09)	(0.00455)

Table A.5 (cont'd)
Panel C overall score

Lookback period	Holding period 1	2	3	6	9	12	18	24
3	0.183*	0.375*	0.408*	1.26***	2.19***	2.96***	5.56***	7.78**
	(1.69)	(1.92)	(1.72)	(3.82)	(3.34)	(3.08)	(2.6)	(2.28)
4	0.275**	0.443**	0.708***	1.78***	2.62***	3.53***	5.99***	8.37***
	(2.55)	(2.55)	(3.28)	(4.45)	(3.86)	(4.39)	(3.09)	(2.65)
5	0.18**	0.446**	0.71***	1.49***	2.48***	3.19***	5.63***	7.67**
	(2.01)	(2.51)	(2.81)	(3.08)	(3.19)	(3.47)	(2.66)	(2.44)
6	0.26***	0.56***	0.897***	1.75***	2.53***	3***	5.42***	7.11**
	(3.6)	(3.55)	(3.5)	(4.29)	(3.78)	(3.75)	(2.6)	(2.35)
7	0.287***	0.617***	0.907***	1.68***	2.44***	2.91***	5.39**	6.74**
	(3.35)	(3.41)	(3.46)	(4.24)	(3.94)	(3.68)	(2.37)	(2.19)
8	0.294***	0.594***	0.858***	1.54***	2.29***	2.98***	5.48**	6.68**
	(3.91)	(3.31)	(3.66)	(4.03)	(3.89)	(3.51)	(2.48)	(2.27)
9	0.327***	0.552***	0.772***	1.43***	2.21***	3.04***	5.25**	6.26**
	(2.96)	(3.16)	(3.76)	(4.12)	(3.95)	(3.02)	(2.31)	(2.33)
10	0.259***	0.478***	0.668***	1.29***	2.15***	2.93***	4.68**	5.51**
	(4.01)	(4.63)	(4.64)	(4.53)	(3.57)	(2.9)	(2.38)	(2.45)
11	0.282***	0.482***	0.722***	1.52***	2.44***	3.17***	4.83**	5.36***
	(4.02)	(4.39)	(4.82)	(4.41)	(3.48)	(2.87)	(2.56)	(2.77)
12	0.297***	0.52***	0.752***	1.56***	2.51***	3.13***	4.38**	4.48***
	(3.83)	(4.62)	(4.71)	(3.54)	(3.07)	(2.62)	(2.35)	(2.61)
13	0.312***	0.469***	0.733***	1.56***	2.43***	3.08**	3.79**	3.19*
	(3.82)	(3.59)	(3.58)	(3.1)	(2.74)	(2.34)	(2.13)	(1.87)
14	0.236***	0.477***	0.794***	1.65***	2.37***	3.19**	3.59**	2.63*
	(3.38)	(3.13)	(3.48)	(3.13)	(2.63)	(2.32)	(2.14)	(1.65)
15	0.266***	0.549***	0.786***	1.73***	2.43***	3.11**	3.34**	2.43
	(3.8)	(3.56)	(3.56)	(3.31)	(2.68)	(2.36)	(2.08)	(1.6)
16	0.295***	0.537***	0.835***	1.71***	2.51***	3.13**	3.35**	2.62*
	(3.99)	(3.57)	(3.54)	(3.27)	(2.72)	(2.46)	(2.22)	(1.76)
17	0.245***	0.547***	0.86***	1.73***	2.59***	3.14**	3.24**	2.57*
	(3.21)	(3.46)	(3.6)	(3.29)	(2.79)	(2.56)	(2.31)	(1.81)
18	0.279***	0.624***	0.979***	1.77***	2.5***	3.04***	3.05**	2.54*
	(3.06)	(3.16)	(3.43)	(3.15)	(2.81)	(2.62)	(2.46)	(1.88)

Table A.5 (cont'd)
Panel D change of overall score

Lookback Period	Holding period 1	2	3	6	9	12	18	24
3	-0.0194	-0.24	-0.6**	-1.21***	-1.8***	-2.55***	-4.49**	-6.3*
	(-0.167)	(-1.24)	(-2.56)	(-4.26)	(-2.78)	(-2.67)	(-2.33)	(-1.78)
4	-0.229*	-0.526***	-0.694***	-1.74***	-2.26***	-3.57***	-5.48**	-7.32*
	(-1.95)	(-3.03)	(-3.44)	(-3.34)	(-2.92)	(-2.89)	(-2.23)	(-1.91)
5	-0.234*	-0.503**	-0.827***	-1.46***	-2.27***	-3.52***	-5.9**	-6.99*
	(-1.95)	(-2.38)	(-2.89)	(-2.85)	(-3.3)	(-2.67)	(-2.08)	(-1.79)
6	-0.33***	-0.681***	-1.01***	-1.52***	-2.15***	-2.98**	-5.75*	-6.27*
	(-3.07)	(-3.22)	(-3.18)	(-3.72)	(-2.87)	(-2.35)	(-1.8)	(-1.66)
7	-0.389***	-0.818***	-1.13***	-1.68***	-2.18**	-2.62**	-5.62*	-6.01*
	(-2.84)	(-3.45)	(-3.32)	(-3.99)	(-2.56)	(-2.1)	(-1.74)	(-1.82)
8	-0.301***	-0.568***	-0.839***	-1.11***	-1.71*	-2.26	-5.37*	-5.18
	(-3.43)	(-3.16)	(-3.65)	(-2.65)	(-1.8)	(-1.55)	(-1.72)	(-1.6)
9	-0.266***	-0.477***	-0.684***	-0.905**	-1.54	-2.19	-4.58*	-4.61
	(-3.18)	(-3.36)	(-3.24)	(-2.1)	(-1.62)	(-1.55)	(-1.67)	(-1.64)
10	-0.225***	-0.375**	-0.507**	-0.829*	-1.36	-2.19*	-3.77*	-4.17*
	(-2.69)	(-2.31)	(-2.47)	(-1.87)	(-1.53)	(-1.66)	(-1.72)	(-1.77)
11	-0.194**	-0.316**	-0.362*	-0.926*	-1.38	-2.36*	-3.56*	-3.82*
	(-2.03)	(-2.05)	(-1.9)	(-1.72)	(-1.52)	(-1.77)	(-1.71)	(-1.71)
12	-0.207***	-0.325**	-0.515***	-0.951	-1.55*	-2.58*	-3.28	-3.11
	(-2.96)	(-2.55)	(-2.72)	(-1.56)	(-1.66)	(-1.93)	(-1.63)	(-1.63)
13	-0.186***	-0.333**	-0.472**	-0.869	-1.65*	-2.55*	-2.59	-1.97
	(-2.82)	(-2.36)	(-2)	(-1.34)	(-1.67)	(-1.83)	(-1.43)	(-1.14)
14	-0.162**	-0.3*	-0.475*	-0.829	-1.64	-2.5*	-2.22	-0.977
	(-2.17)	(-1.76)	(-1.71)	(-1.24)	(-1.56)	(-1.7)	(-1.25)	(-0.636)
15	-0.105	-0.247	-0.359	-0.886	-1.75	-2.31*	-2.08	-0.398
	(-1.29)	(-1.33)	(-1.16)	(-1.29)	(-1.64)	(-1.71)	(-1.31)	(-0.284)
16	-0.0867	-0.242	-0.355	-1.11	-2.08*	-2.38*	-2.2	-0.26
	(-0.837)	(-1.12)	(-1.12)	(-1.56)	(-1.73)	(-1.77)	(-1.31)	(-0.159)
17	-0.126	-0.256	-0.437	-1.28*	-2.08*	-2.28*	-1.86	0.322
	(-1.07)	(-1.09)	(-1.36)	(-1.69)	(-1.69)	(-1.78)	(-1.15)	(0.22)
18	-0.0977	-0.288	-0.564*	-1.36*	-1.86	-2.02	-1.41	0.787
	(-0.736)	(-1.36)	(-1.77)	(-1.72)	(-1.62)	(-1.63)	(-0.969)	(0.577)

*,**,*** indicate statistical significance at 10%,5%,1%

Table A.6 Monthly four-factor alphas for declining-improving portfolios of most recommended and least recommended firms

Panels in this table, report the returns after adjusting risk with Fama-French-Carhart four-factor model for declining-improving portfolios of most(least) recommended firms. Declining-improving portfolios are constructed separately on most recommended firms and least recommended firms. A firm is classified as most recommended firm if its average job recommendation score of previous look-back period is less or equal to the median. A firm is classified as a least recommended firm if its average job recommendation score of pervious look-back period is larger than the median

Panel A Most recommended firms

		holding period							
		1	2	3	6	9	12	18	24
Look-back period	3	0.211	0.385**	0.458**	0.351**	0.337***	0.316***	0.217*	0.218*
		(1.13)	(2.18)	(2.33)	(2.31)	(2.73)	(2.84)	(1.87)	(1.95)
	4	0.311	0.226	0.189	0.189	0.226**	0.19*	0.1	0.106
		(1.21)	(0.917)	(0.923)	(1.31)	(2.2)	(1.97)	(1.04)	(1.13)
	5	0.0752	0.112	0.112	0.209	0.256**	0.231*	0.153	0.139
		(0.347)	(0.588)	(0.674)	(1.41)	(2.13)	(1.96)	(1.32)	(1.23)
	6	0.273	0.281	0.317*	0.401***	0.385***	0.336***	0.294***	0.256**
		(1.52)	(1.65)	(1.98)	(3.15)	(3.33)	(3.01)	(2.88)	(2.55)
	7	0.247	0.5***	0.557***	0.533***	0.497***	0.425***	0.395***	0.332***
		(1.28)	(2.87)	(3.42)	(3.76)	(3.66)	(3.24)	(3.24)	(2.73)
	8	0.614***	0.635***	0.529***	0.47***	0.425***	0.357***	0.313***	0.251***
		(4)	(4.32)	(4.1)	(3.96)	(4.08)	(3.8)	(3.87)	(3.31)
	9	0.487***	0.4***	0.334**	0.365***	0.317***	0.248***	0.197**	0.146**
		(2.94)	(2.74)	(2.49)	(3.13)	(3.23)	(2.76)	(2.63)	(2.04)
	10	0.315**	0.31**	0.36***	0.368***	0.273***	0.229**	0.149*	0.101
		(2.05)	(2.3)	(2.79)	(3.44)	(2.83)	(2.62)	(1.96)	(1.44)
	11	0.236	0.302**	0.321**	0.307***	0.221**	0.17*	0.098	0.0638
		(1.66)	(2.19)	(2.41)	(2.82)	(2.19)	(1.82)	(1.19)	(0.832)
	12	0.487***	0.449***	0.429***	0.317***	0.278***	0.242***	0.166**	0.133*
		(3.27)	(3.16)	(3.12)	(2.99)	(2.91)	(2.68)	(2.08)	(1.76)
	13	0.348**	0.359**	0.314**	0.246**	0.244**	0.199**	0.111	0.098
		(2.34)	(2.57)	(2.52)	(2.26)	(2.48)	(2.16)	(1.35)	(1.26)
	14	0.307*	0.287*	0.276*	0.25*	0.239*	0.2	0.12	0.121
		(1.79)	(1.85)	(1.97)	(1.84)	(1.89)	(1.65)	(1.03)	(1.06)
	15	0.192	0.125	0.135	0.133	0.1	0.0418	0.0073	-0.00131
		(1.57)	(1.12)	(1.17)	(1.18)	(1.01)	(0.471)	(0.0972)	(-0.0186)
	16	0.0473	0.0608	0.0483	0.07	0.0471	-0.0194	-0.0415	-0.059
		(0.346)	(0.431)	(0.335)	(0.549)	(0.416)	(-0.192)	(-0.477)	(-0.712)
	17	0.102	0.0462	0.0841	0.0959	0.0705	0.00261	-0.0054	-0.0326
		(0.594)	(0.284)	(0.549)	(0.683)	(0.56)	(0.0228)	(-0.053)	(-0.334)
	18	0.0943	0.0557	0.0969	0.037	-0.0276	-0.0886	-0.094	-0.123
		(0.567)	(0.359)	(0.647)	(0.266)	(-0.222)	(-0.788)	(-0.896)	(-1.2)

Table A.6 (cont'd)
Panel B Least recommended firms

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.235	-0.0607	-0.0375	-0.192	-0.177	-0.17	-0.152	-0.105
	(-0.995)	(-0.288)	(-0.2)	(-1.34)	(-1.29)	(-1.29)	(-1.15)	(-0.808)
4	-0.117	-0.126	-0.132	-0.128	-0.118	-0.128	-0.106	-0.0571
	(-0.527)	(-0.657)	(-0.782)	(-0.915)	(-0.865)	(-1.03)	(-0.866)	(-0.478)
5	0.16	0.0591	-0.0026	-0.168	-0.0882	-0.0878	-0.022	-0.0181
	(0.756)	(0.316)	(-0.0149)	(-1.11)	(-0.673)	(-0.779)	(-0.197)	(-0.167)
6	0.2	0.103	0.101	-0.0347	-0.0581	-0.111	-0.0381	-0.0128
	(1.05)	(0.622)	(0.649)	(-0.239)	(-0.455)	(-0.99)	(-0.367)	(-0.125)
7	-0.00941	0.0589	0.0179	-0.0296	-0.0751	-0.129	-0.0346	-0.00908
	(-0.0475)	(0.326)	(0.105)	(-0.201)	(-0.576)	(-1.1)	(-0.313)	(-0.0836)
8	0.0289	-0.00349	0.00639	-0.0725	-0.152	-0.138	-0.0685	-0.0511
	(0.143)	(-0.018)	(0.0367)	(-0.492)	(-1.19)	(-1.25)	(-0.643)	(-0.504)
9	0.105	0.0472	0.073	-0.0284	-0.0933	-0.0595	-0.0361	-0.011
	(0.531)	(0.278)	(0.487)	(-0.211)	(-0.806)	(-0.577)	(-0.371)	(-0.12)
10	0.0606	0.136	0.125	-0.0174	-0.0449	-0.0594	-0.0258	-0.0382
	(0.347)	(0.764)	(0.749)	(-0.115)	(-0.33)	(-0.449)	(-0.206)	(-0.329)
11	0.0671	0.0549	-0.00913	-0.0129	-0.026	-0.044	0.00204	-0.032
	(0.39)	(0.304)	(-0.0521)	(-0.0865)	(-0.181)	(-0.304)	(0.0149)	(-0.259)
12	0.162	0.0542	0.00165	-0.0611	-0.101	-0.0851	-0.0404	-0.0877
	(0.848)	(0.313)	(0.0103)	(-0.436)	(-0.705)	(-0.615)	(-0.303)	(-0.725)
13	0.15	0.105	0.0794	-0.0358	-0.0128	-0.000665	0.0344	-0.0114
	(0.874)	(0.698)	(0.589)	(-0.28)	(-0.097)	(-0.00514)	(0.295)	(-0.113)
14	0.157	0.0218	-0.0258	-0.0532	-0.00236	0.0323	0.0436	-0.00781
	(0.965)	(0.16)	(-0.224)	(-0.423)	(-0.0184)	(0.255)	(0.362)	(-0.0767)
15	0.0267	-0.113	-0.105	-0.0274	0.0312	0.0433	0.0341	-0.0296
	(0.151)	(-0.886)	(-0.806)	(-0.2)	(0.227)	(0.34)	(0.258)	(-0.271)
16	-0.135	-0.189	-0.23*	-0.053	0.00132	-0.0155	-0.0336	-0.0991
	(-0.775)	(-1.47)	(-1.74)	(-0.393)	(0.0099)	(-0.124)	(-0.252)	(-0.903)
17	-0.119	-0.196	-0.0858	0.0225	0.0255	-0.000418	-0.0356	-0.0841
	(-0.667)	(-1.46)	(-0.572)	(0.161)	(0.186)	(-0.00314)	(-0.26)	(-0.688)
18	-0.17	-0.101	0.043	0.0608	0.0592	0.0376	0.0136	-0.0269
	(-0.956)	(-0.697)	(0.292)	(0.423)	(0.416)	(0.26)	(0.0984)	(-0.207)

*,**,*** indicate statistical significance at 10%,5%,1%

Table A.7 Accounting Profitability Result

Next year profit margin ($\text{profit\_margin}_{t+12}$) is regressed on current profit margin(profit_margin_t), the interaction of change of score$\left(\Delta\text{Score}^i_{t-6,t}\right)$, and an indicator ($\text{high_score}_{t-6}$) whether the firm is a high rated firm 6 month, logarithm of market capitalization ($\ln\left(\text{ME}^i_t\right)$), logarithm of book-to-market ratio ($\ln\left(\text{BM}^i_t\right)$), momentum ($\text{Mom}_t$), current month return($R_t$), previous year investment(investment_t), long term debt (long_term_debt_t) and research and development ($R\&D_t$). The regression formula is:

$$\begin{aligned}\text{profit\_margin}_{t+12} &= \alpha\text{profit\_margin}_t + \Delta\text{Score}^i_{t-6,t}(\beta_+\text{high\_score}_{t-6} + \beta_-\text{low\_score}_{t-6}) \\ &+ \sigma\text{high\_score}_t + \rho\text{high\_score}_{t-6} + \lambda X_t\end{aligned}$$

Panel A job recommendation score

Dependent variable	1	2	3	4
$\text{profit\_margin}_{t+12}$	0.358	0.316	0.313	0.312
	(1.574)	(1.261)	(1.246)	(1.230)
$\Delta\text{recom\_score}^i_{t-6,t} \times$				
weak_recom_{t-6}	0.0317	0.0206	0.0241	0.0237
	(0.798)	(0.468)	(0.548)	(0.533)
$\text{strong\_recom}_{t-6}$	0.0149	0.0571*	0.0590**	0.0596**
	(0.451)	(1.940)	(2.022)	(2.039)
strong_recom_t	0.0235*	0.0115	0.0104	0.0109
	(1.945)	(0.985)	(0.881)	(1.063)
$\text{strong\_recom}_{t-6}$	0.0164*	-0.000512	-0.00277	-0.00229
	(1.649)	(-0.0646)	(-0.356)	(-0.261)
$\ln(\text{ME}_t)$		0.0245***	0.0243***	0.0239***
		(4.026)	(4.029)	(4.086)
$\ln(\text{BM}_t)$		0.00296	-0.000603	-0.000924
		(0.305)	(-0.0556)	(-0.0691)
Mom_t		0.0237***	0.0252***	0.0251***
		(2.669)	(2.798)	(2.780)
R_t		0.0961*	0.0919	0.0922
		(1.689)	(1.585)	(1.621)
investment_t			-0.142	-0.141
			(-1.445)	(-1.617)
long_term_debt_t			-0.0497***	-0.0520***
			(-3.152)	(-2.667)
$R\&D_t$				-0.104
				(-0.528)
$\text{is\_missing\_R\&D}_t$				-0.0189
				(-1.145)
Constant	0.0190	-0.179***	-0.163***	-0.149***
	(1.429)	(-4.321)	(-4.080)	(-3.988)
Observations	4,769	4,423	4,381	4,381
R-squared	0.190	0.208	0.208	0.209
fixed effect	*Quater* × *industry*	*Quater* × *industry*	*Quater* × *industry*	*Quater* × *industry*

Table A.7 (cont'd)
Panel B overall score

Dependent variable	1	2	3	4
$profit\_margin_{t+12}$	0.362	0.319	0.316	0.314
	(1.634)	(1.301)	(1.286)	(1.270)
$\Delta ovearll\_score^{i}_{t-6,t} \times$				
$low\_overall\_score_{t-6}$	-0.0270	-0.0216	-0.0220	-0.0221
	(-1.062)	(-0.758)	(-0.770)	(-0.783)
$high\_overall\_score_{t-6}$	-0.0140	-0.0289**	-0.0297**	-0.0301**
	(-0.970)	(-2.050)	(-2.146)	(-2.176)
$high\_overall\_score_{t}$	0.0302**	0.0144	0.0128	0.0134
	(2.043)	(0.973)	(0.872)	(1.035)
$high\_overall\_score_{t-6}$	0.000714	-0.00882	-0.00978	-0.00965
	(0.0696)	(-0.963)	(-1.104)	(-0.969)
$\ln(ME_t)$		0.0241***	0.0238***	0.0235***
		(3.924)	(3.926)	(4.035)
$\ln(BM_t)$		0.000512	-0.00305	-0.00349
		(0.0594)	(-0.315)	(-0.287)
Mom_t		0.0162**	0.0165**	0.0163**
		(2.227)	(2.193)	(2.158)
R_t		0.105**	0.102*	0.102*
		(2.030)	(1.933)	(1.935)
$investment_t$			-0.147*	-0.146*
			(-1.671)	(-1.854)
$long\_term\_debt_t$			-0.0470***	-0.0491***
			(-3.180)	(-2.637)
$R\&D_t$				-0.0893
				(-0.487)
$is\_missing\_R\&D_t$				-0.0140
				(-0.963)
Constant	0.0230*	-0.172***	-0.156***	-0.145***
	(1.922)	(-4.174)	(-3.995)	(-3.987)
Observations	5,328	4,942	4,898	4,898
R-squared	0.192	0.209	0.209	0.210
fixed effect	$Quater \times industry$	$Quater \times industry$	$Quater \times industry$	$Quater \times industry$

*,**,*** indicate statistical significance at 10%,5%,1%

Table A.8 Idiosyncratic volatility regression Result

Future 6-month idiosyncratic volatility ($ivol_{t+6}$) is regressed on 6-month idiosyncratic volatility $ivol_{t+6}$, the interaction of change of score $(\Delta \text{Score}^{i}_{t-6,t})$, and an indicator($\text{high\_score}_{t-6}$) whether the firm is a high rated firm 6 month prior, logarithm of market capitalization ($\ln(\text{ME}^{i}_{t})$), logarithm of book-to-market ratio ($\ln(\text{BM}^{i}_{t})$), momentum (Mom_t), current month return(R_t), previous year investment(investment_t), long term debt (long_term_debt_t) and research and development ($R\&D_t$). The regression formula is:

$$\text{ivol}_{t+6} = \alpha \text{ivol}_t + \Delta \text{Score}^{i}_{t-6,t}(\beta_{+}\text{high\_score}_{t-6} + \beta_{-}\text{low\_score}_{t-6}) + \sigma \text{high\_score}_t + \rho \text{high\_score}_{t-6} + \lambda X_t$$

Panel A job recommendation score

Dependent variable	1	2	3	4
ivol_{t+12}	0.602***	0.592***	0.586***	0.578***
	(7.174)	(22.10)	(21.73)	(21.19)
$\Delta\text{recom\_score}^{i}_{t-6,t} \times$				
weak_recom_{t-6}	0.000370	0.00117	0.00103	0.00109
	(0.395)	(1.362)	(1.195)	(1.270)
$\text{strong\_recom}_{t-6}$	0.00193**	-0.000104	-0.000108	-0.000154
	(2.177)	(-0.132)	(-0.140)	(-0.199)
strong_recom_t	-0.000411	0.000415*	0.000391	0.000312
	(-1.308)	(1.708)	(1.601)	(1.277)
$\text{strong\_recom}_{t-6}$	-0.000925***	-0.000240	-0.000220	-0.000278
	(-2.932)	(-0.971)	(-0.882)	(-1.115)
$\ln(\text{ME}_t)$		-0.00105***	-0.00103***	-0.00103***
		(-12.03)	(-11.96)	(-11.96)
$\ln(\text{BM}_t)$		2.68e-05	0.000168	0.000274**
		(0.231)	(1.378)	(2.239)
Mom_t		3.81e-05	-2.86e-05	-1.83e-05
		(0.124)	(-0.0947)	(-0.0607)
R_t		-0.00521***	-0.00502***	-0.00506***
		(-3.183)	(-3.077)	(-3.126)
investment_t			0.00990***	0.00963***
			(4.537)	(4.424)
long_term_debt_t			0.000551	0.000811*
			(1.247)	(1.820)
$R\&D_t$				0.00939***
				(4.788)
$\text{is\_missing\_R\&D}_t$				0.000144
				(0.592)
Constant	0.00694***	0.0152***	0.0147***	0.0146***
	(4.427)	(14.19)	(13.98)	(13.76)
Observations	4,917	4,682	4,638	4,638
R-squared	0.556	0.629	0.632	0.634
fixed effect	*Quater* × *industry*	*Quater* × *industry*	*Quater* × *industry*	*Quater* × *industry*

Table A.8 (cont'd)
Panel B overall score

Dependent variable	1	2	3	4
$profit\_margin_{t+12}$	0.621***	0.596***	0.590***	0.582***
	(7.947)	(23.75)	(23.30)	(22.81)
$\Delta overall\_score^{i}_{t-6,t} \times$				
$low\_overall\_score_{t-6}$	0.000242	-0.000210	-0.000185	-0.000180
	(0.672)	(-0.676)	(-0.591)	(-0.578)
$high\_overall\_score_{t-6}$	-0.000556	0.000322	0.000317	0.000350
	(-1.619)	(1.060)	(1.050)	(1.160)
$high\_overall\_score_{t}$	-0.000586**	0.000154	0.000169	7.02e-05
	(-2.051)	(0.675)	(0.740)	(0.307)
$high\_overall\_score_{t-6}$	-0.000373	0.000189	0.000173	0.000121
	(-1.363)	(0.815)	(0.743)	(0.517)
$\ln(ME_t)$		-0.00111***	-0.00110***	-0.00109***
		(-12.94)	(-12.88)	(-12.73)
$\ln(BM_t)$		-6.41e-05	7.52e-05	0.000190
		(-0.537)	(0.599)	(1.527)
Mom_t		-9.99e-06	-2.74e-05	-1.54e-05
		(-0.0589)	(-0.165)	(-0.0930)
R_t		-0.00582***	-0.00568***	-0.00570***
		(-3.839)	(-3.746)	(-3.793)
$investment_t$			0.00892***	0.00868***
			(4.292)	(4.187)
$long\_term\_debt_t$			0.000771*	0.00104**
			(1.853)	(2.479)
$R\&D_t$				0.00981***
				(4.611)
$is\_missing\_R\&D_t$				0.000241
				(0.927)
Constant	0.00649***	0.0154***	0.0151***	0.0148***
	(4.444)	(15.31)	(15.11)	(14.56)
Observations	5,497	5,236	5,190	5,190
R-squared				
fixed effect	$Quater \times industry$	$Quater \times industry$	$Quater \times industry$	$Quater \times industry$

*,**,*** indicate statistical significance at 10%,5%,1%

APPENDIX B FIGURES AND TABLES FOR CHAPTER 2

Table B.1 Summary statistics for review ratings and firm characteristics

Panel A Summary statistics of Glassdoor review ratings for current employees

	Current employee			
	Nobs.	Mean	Median	Sd
job recommendation probability	369,945	0.64	1.00	0.48
compensation & benefits	303,754	3.28	3.00	1.20
Business outlook	278,832	0.29	0.00	0.77
career & opportunity	304,152	3.21	3.00	1.26

Panel B Summary statistics of Glassdoor review ratings for former employees

	Former employee			
	Nobs	Mean	Median	Sd
job recommendation probability	253161	0.50	1.00	0.50
compensation & benefits	220480	3.12	3.00	1.23
Business outlook	195008	0.04	0.00	0.77
career & opportunity	220492	2.86	3.00	1.24

Panel C. Correlation between glass door review ratings

	job recommendation probability	compensation & benefits	Business outlook	career & opportunity
job recommendation probability	1.00	0.49	0.59	0.61
compensation & benefits	0.49	1.00	0.41	0.56
Business outlook	0.59	0.41	1.00	0.55
career & opportunity	0.61	0.56	0.55	1.00

Panel D Summary statistics for firm characteristics of firms in Glassdoor

	Nobs.	Mean	Median	Sd
market capitalization (in millions)	23,393	4760.94	574.03	18962.71
Tobin's q	23,393	1.78	1.32	1.41
gross sale growth	23,393	1.17	1.05	2.07
return on asset	23,393	0.08	0.10	0.22
leverage	23,393	0.21	0.15	0.26
dividend yield	23,393	0.01	0.00	0.05
research and development	23,393	0.05	0.00	0.13
Herfindahl-Hirschman index of sales	23,393	0.93	1.00	0.16
analyst coverage	23,393	6.92	5.00	6.99
institutional ownership	23,393	0.58	0.66	0.32

Table B.2 Hedge fund activism events count statistics

Panel A Number of hedge fund activism events by year

Year	Total	Events after firms in glass door database	Percentage
2008	257	38	0.15
2009	141	44	0.31
2010	167	74	0.44
2011	162	90	0.56
2012	185	106	0.57
2013	201	141	0.70
2014	176	128	0.73
Total	1289	621	

Panel B Number of hedge fund activism event clusters* by year

Year	Total	Event clusters after firms in glass door database	Percentage
2008	208	33	0.16
2009	112	35	0.31
2010	142	58	0.41
2011	142	81	0.57
2012	157	89	0.57
2013	170	117	0.69
2014	147	105	0.71
Total	1078	518	

Panel C Number of hedge fund activism event clusters* with glass door rating at the event month by year

year	Overall rating	CEO approval	Job recommendation	Business outlook	Compensation & benefits	Career & opportunity	Work-life balance
2008	2	2	2				
2009	0	0	0				
2010	13	3	8				
2011	22	14	19				
2012	30	23	25	10	11	11	11
2013	33	23	30	29	31	32	31
2014	46	35	40	40	42	42	43
Total	146	100	124	79	84	85	85

*For a firm, a sequence of events is considered forming a cluster of events if each event takes place within 24 months of another event in the sequence

Table B.3 Probit regression for the probability of a firm being targeted by a hedge fund

	coef	std	z	P>|z|	marginal effect
ln(market capitalization)	-0.246**	0.031	-7.888	0.000	-0.019
Tobin's q	-0.207**	0.030	-6.832	0.000	-0.016
gross sales growth	-0.0154	0.024	-0.636	0.525	-0.001
return on asset	0.0481*	0.025	1.907	0.056	0.004
dividend yield	0.0001	0.015	0.008	0.994	0.000
leverage	0.0175	0.019	0.940	0.347	0.001
research and development	0.0629**	0.026	2.405	0.016	0.005
Herfindahl-Hirschman index of sales	-0.0398**	0.016	-2.439	0.015	-0.003
ln(1+ analyst coverage)	0.0607**	0.028	2.178	0.029	0.005
institutional ownership	0.1328***	0.021	6.180	0.000	0.010
missing Herfindahl-Hirschman index of sales	0.0000197	0.048	0.000	1.000	0.000
Intercept	-1.6854***	0.106	-15.852	0.000	

*p<0.1, **p<0.05, ***p<0.01

Table B.4 Impact on glass door rating changes

This table lists the average treatment effect on the treated (ATT) of the 6-month average rating changes from before the hedge fund activism campaign to after the hedge fund activism campaign. The 6-month average ratings before the campaign are the average ratings of 6-month periods ending 2 months before the campaign, including the ratings in the 2nd month before the campaign.

Panel A

Impact on business outlook	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	-0.0409	-0.0874	-0.129*	-0.0401	-0.169*	-0.0922	0.413
t	-0.476	-1.28	-1.92	-0.51	-1.67	-0.865	1.01
AI std	0.0859	0.0683	0.0672	0.0787	0.101	0.107	0.407
p value	0.634	0.201	0.0545	0.61	0.0942	0.387	0.31
minimum p value of paired t- test for balancing*	0.38	0.248	0.185	0.197	0.379	0.202	0.204
nTreated/nConroll	39/39	57/57	58/58	44/44	28/28	18/18	7/7
nObs	12615	18364	17910	13310	9167	5325	1784
nDrops	4	3	2	0	0	0	0

Panel B

Impact on job recommendation probability	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	-0.0328	-0.0336	-0.0564**	0.0205	-0.117***	-0.0604	-0.0731
t	-0.978	-1.03	-2.08	0.6	-2.8	-1.49	-1.4
AI std	0.0335	0.0327	0.0272	0.0341	0.0416	0.0405	0.0522
p value	0.328	0.304	0.0377	0.548	0.00512	0.136	0.162
minimum p value of paired t-test for balancing*	0.191	0.259	0.221	0.12	0.155	0.338	0.195
nTreated/nConroll	67/67	84/84	90/90	76/76	59/59	49/49	36/36
nObs	26180	32124	32025	27828	23835	20064	16431
nDrops	4	4	3	1	1	1	2

Table B.4 (cont'd)
Panel C

Impact on career & opportunity	Average rating change for 6-month period ending at -9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	0.039	-0.0832	-0.145*	-0.0196	-0.22**	-0.134	0.27
t	0.308	-0.923	-1.87	-0.192	-2.1	-0.832	1.5
AI std	0.127	0.0902	0.0777	0.102	0.105	0.161	0.18
p value	0.758	0.356	0.0618	0.847	0.0362	0.405	0.134
minimum p value of paired t-test for balancing*	0.318	0.31	0.191	0.157	0.305	0.329	0.204
nTreated/nConroll	40/40	59/59	60/60	46/46	29/29	18/18	7/7
nObs	13284	19215	18809	14015	9668	5662	1934
nDrops	4	3	2	1	0	0	0

Panel D

Impact on compensation & benefits	Average rating change for 6-month period ending at -9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	-0.0401	-0.0645	-0.0996	0.107	-0.158	-0.0136	-0.244
t	-0.402	-0.844	-1.21	1.13	-1.23	-0.0793	-0.558
AI std	0.0998	0.0765	0.0822	0.0952	0.128	0.171	0.438
p value	0.687	0.399	0.225	0.259	0.217	0.937	0.577
minimum p value of paired t-test for balancing*	0.289	0.352	0.204	0.184	0.305	0.322	0.204
nTreated/nConroll	40/40	61/61	62/62	47/47	29/29	18/18	7/7
nObs	13248	19189	18782	13991	9621	5618	1907
nDrops	4	3	2	1	0	0	0

*p < 0.1, **p < 0.05, ***p< 0.01
*Minimum p value of paired t-test is the minimum of the paired t-tests of continuous firm characteristic variables in the probit model between target firms and non-target firms

APPENDIX C MORE FIGURES AND TABLES FOR CHAPTER 1

Figure C.1 The Sample of Glassdoor Review

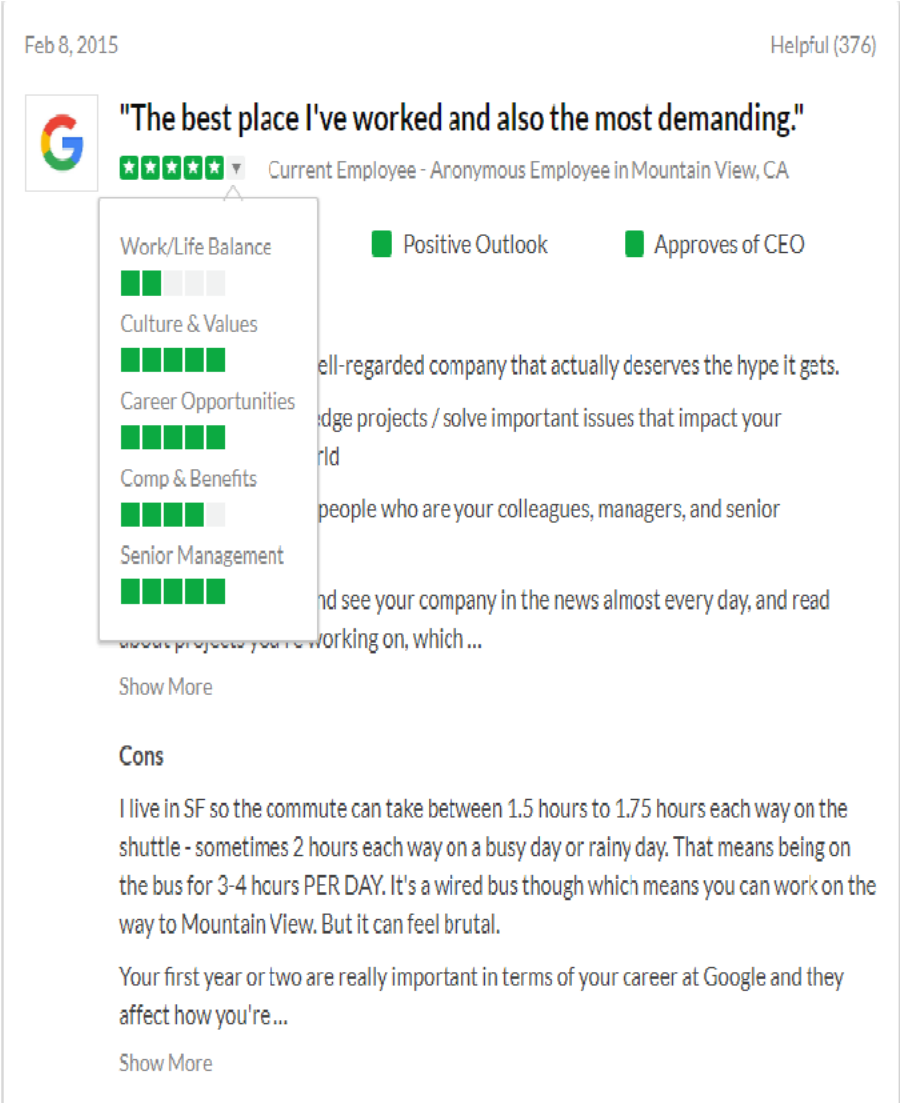


Table C.1 Robustness check for monthly four-factor alphas of declining-improving portfolios based on job recommendation score change

Panels in this table report, for robustness check purpose, the alphas after adjusting risk with Fama-French-Carhart four-factor model for declining-improving portfolios based on the change of job recommendation score. Two types of robustness checked is performed. One check is performed by dividing the whole period into three periods. The other type of check is to change the price cutoff and number of reviews cutoff for a stock being considered in portfolio construction

Panel A Period June 2008-December 2011

	holding period							
Look-back period	1	2	3	6	9	12	18	24
3	0.0264	0.147	0.228	0.178	0.262**	0.197*	0.0684	0.131
	(0.102)	(0.65)	(1.04)	(1.09)	(2.46)	(1.87)	(0.73)	(1.57)
4	0.15	0.178	0.258	0.265	0.255*	0.196	0.095	0.156
	(0.565)	(0.635)	(0.987)	(1.38)	(1.93)	(1.51)	(0.807)	(1.53)
5	0.441	0.513*	0.405	0.382*	0.394***	0.313**	0.231**	0.253**
	(1.49)	(1.78)	(1.54)	(1.92)	(2.86)	(2.35)	(2.02)	(2.46)
6	0.607*	0.626*	0.45	0.562***	0.496***	0.374**	0.389***	0.341**
	(1.95)	(1.92)	(1.57)	(2.89)	(3.05)	(2.35)	(2.89)	(2.63)
7	0.313	0.539*	0.644**	0.629***	0.54***	0.382**	0.423***	0.382**
	(0.975)	(1.86)	(2.46)	(3.15)	(2.85)	(2.08)	(2.73)	(2.61)
8	0.349	0.491**	0.486**	0.433**	0.383**	0.214	0.277***	0.24***
	(1.57)	(2.38)	(2.47)	(2.36)	(2.34)	(1.53)	(2.69)	(2.77)
9	0.398	0.49**	0.527**	0.478**	0.315**	0.181	0.251**	0.211**
	(1.69)	(2.62)	(2.7)	(2.68)	(2.11)	(1.43)	(2.5)	(2.53)
10	0.407*	0.391*	0.393*	0.426**	0.262*	0.185	0.194*	0.11
	(1.99)	(1.93)	(1.98)	(2.45)	(1.77)	(1.54)	(1.9)	(1.14)
11	0.163	0.227	0.273	0.238	0.138	0.0994	0.107	0.0262
	(0.847)	(1.08)	(1.29)	(1.3)	(0.845)	(0.735)	(0.884)	(0.22)
12	0.377*	0.421**	0.465**	0.306*	0.248*	0.23*	0.165	0.0958
	(1.72)	(2.09)	(2.53)	(2.03)	(1.73)	(1.89)	(1.51)	(0.891)
13	0.364	0.419**	0.41**	0.208	0.255	0.226	0.148	0.0826
	(1.5)	(2.11)	(2.36)	(1.32)	(1.67)	(1.61)	(1.23)	(0.716)
14	0.27	0.282	0.23	0.17	0.221	0.241	0.147	0.113
	(1.3)	(1.59)	(1.39)	(0.977)	(1.36)	(1.63)	(1.2)	(0.968)
15	0.172	0.0774	0.0553	0.0446	0.119	0.0799	0.0483	0.0262
	(1.1)	(0.655)	(0.497)	(0.356)	(0.909)	(0.733)	(0.504)	(0.268)
16	0.0107	0.00161	-0.0414	0.0432	0.0651	0.00396	-0.011	-0.0382
	(0.0876)	(0.0118)	(-0.318)	(0.283)	(0.443)	(0.0321)	(-0.0989)	(-0.32)
17	0.0932	-0.0819	-0.0707	0.0196	0.00864	0.0138	0.0616	-0.0247
	(0.521)	(-0.515)	(-0.455)	(0.114)	(0.0519)	(0.101)	(0.486)	(-0.195)
18	-0.205	-0.0419	0.0825	0.0572	0.00321	0.0471	0.0702	-0.017
	(-1.49)	(-0.244)	(0.438)	(0.304)	(0.0173)	(0.31)	(0.507)	(-0.12)

Table C.1 (cont'd)
Panel B Period January 2010-December 2013

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.0316	0.0572	0.111	0.0638	0.0859	0.0419	0.0139	0.0256
	(-0.16)	(0.344)	(0.809)	(0.708)	(1.19)	(0.55)	(0.239)	(0.503)
4	0.277	0.276	0.281*	0.214	0.231*	0.177	0.156	0.106
	(1.41)	(1.53)	(1.7)	(1.49)	(1.79)	(1.37)	(1.52)	(1.13)
5	0.287	0.253*	0.128	0.126	0.131	0.11	0.126	0.0548
	(1.64)	(1.68)	(0.869)	(1.04)	(1.3)	(1.23)	(1.66)	(0.829)
6	0.184	0.164	0.13	0.244	0.187	0.164	0.144	0.0958
	(0.887)	(0.835)	(0.646)	(1.58)	(1.4)	(1.28)	(1.33)	(0.957)
7	0.233	0.136	0.268	0.334**	0.261*	0.243*	0.195*	0.181*
	(1.19)	(0.673)	(1.41)	(2.27)	(1.84)	(1.8)	(1.7)	(1.73)
8	0.287	0.285	0.317**	0.4***	0.301**	0.263**	0.212**	0.199**
	(1.51)	(1.67)	(2.08)	(3.07)	(2.25)	(2.13)	(2.07)	(2.08)
9	0.327*	0.33*	0.405**	0.445***	0.372**	0.339**	0.281**	0.218*
	(1.79)	(1.95)	(2.5)	(2.96)	(2.58)	(2.49)	(2.4)	(1.92)
10	0.313*	0.348**	0.368***	0.362***	0.31***	0.279***	0.256***	0.179**
	(1.95)	(2.57)	(2.73)	(3.1)	(2.82)	(2.82)	(2.94)	(2.22)
11	0.311**	0.297**	0.297**	0.312***	0.248**	0.241***	0.196**	0.157**
	(2.06)	(2.39)	(2.43)	(2.87)	(2.52)	(2.79)	(2.49)	(2.17)
12	0.228*	0.288**	0.308**	0.326***	0.293***	0.274***	0.241***	0.16**
	(1.93)	(2.54)	(2.67)	(3.33)	(3.4)	(3.53)	(3.26)	(2.24)
13	0.428***	0.379***	0.382***	0.336***	0.296***	0.271***	0.207***	0.134*
	(3.59)	(3.21)	(3.53)	(3.75)	(3.62)	(3.45)	(2.78)	(1.71)
14	0.47***	0.365***	0.308***	0.261***	0.284***	0.236***	0.227***	0.102
	(3.72)	(3.19)	(2.77)	(2.82)	(3.32)	(2.74)	(2.82)	(1.2)
15	0.295***	0.218**	0.194**	0.218***	0.226***	0.183**	0.142**	0.0727
	(2.73)	(2.35)	(2.22)	(2.91)	(3.24)	(2.55)	(2.01)	(0.973)
16	0.272**	0.227**	0.226**	0.237**	0.244***	0.201**	0.238**	0.0884
	(2.42)	(2.1)	(2.18)	(2.65)	(2.73)	(2.26)	(2.4)	(1)
17	0.184	0.136	0.0962	0.167*	0.153	0.109	0.134	0.023
	(1.58)	(1.27)	(0.99)	(1.85)	(1.65)	(1.17)	(1.43)	(0.262)
18	0.0978	0.0299	0.0827	0.172*	0.143	0.125	0.0987	0.0239
	(0.741)	(0.272)	(0.841)	(1.84)	(1.42)	(1.21)	(0.983)	(0.253)

Table C.1 (cont'd)
Panel C Period January 2012-December 2015

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.144	0.0344	0.119	0.132	0.124	0.121	0.101	0.111
	(-0.897)	(0.216)	(0.792)	(1.19)	(1.22)	(1.23)	(1.05)	(1.21)
4	-0.1	-0.0507	-0.0137	-0.0453	-0.0447	-0.0564	-0.0507	-0.0486
	(-0.755)	(-0.385)	(-0.127)	(-0.473)	(-0.514)	(-0.701)	(-0.659)	(-0.654)
5	-0.0257	0.00271	0.00145	0.0064	0.00281	-0.0177	-0.00926	-0.0272
	(-0.144)	(0.0217)	(0.0132)	(0.0636)	(0.0318)	(-0.224)	(-0.125)	(-0.383)
6	0.118	0.17	0.13	0.134	0.0985	0.0702	0.057	0.0414
	(0.713)	(1.21)	(0.941)	(1.23)	(1.15)	(0.946)	(0.824)	(0.628)
7	0.275	0.211	0.232*	0.188*	0.151*	0.118	0.12*	0.122*
	(1.45)	(1.33)	(1.75)	(2)	(1.88)	(1.56)	(1.73)	(1.81)
8	0.296*	0.237**	0.262***	0.244***	0.182**	0.16**	0.168**	0.17***
	(2)	(2.06)	(2.77)	(3.24)	(2.43)	(2.26)	(2.63)	(2.71)
9	0.201	0.219**	0.219**	0.188**	0.13*	0.147*	0.134**	0.127**
	(1.6)	(2.61)	(2.67)	(2.42)	(1.8)	(2)	(2.05)	(2.35)
10	0.379***	0.327***	0.327***	0.21**	0.205**	0.188**	0.174**	0.148**
	(3.31)	(3.18)	(3.39)	(2.49)	(2.51)	(2.17)	(2.19)	(2.36)
11	0.317**	0.255**	0.23**	0.162*	0.177*	0.155	0.162*	0.142*
	(2.12)	(2.37)	(2.23)	(1.79)	(1.91)	(1.66)	(1.93)	(1.99)
12	0.251*	0.181	0.169*	0.152	0.175*	0.158	0.154*	0.128*
	(1.97)	(1.68)	(1.76)	(1.63)	(1.82)	(1.59)	(1.69)	(1.69)
13	0.219*	0.228**	0.2**	0.163	0.155	0.142	0.115	0.081
	(1.96)	(2.27)	(2.07)	(1.6)	(1.48)	(1.37)	(1.33)	(1.16)
14	0.116	0.0821	0.0693	0.0911	0.0937	0.0862	0.0743	0.0269
	(1.04)	(0.815)	(0.679)	(0.847)	(0.848)	(0.783)	(0.74)	(0.355)
15	0.0677	0.115	0.119	0.121	0.119	0.0871	0.0725	0.0261
	(0.581)	(0.971)	(1.07)	(1.07)	(1.05)	(0.827)	(0.774)	(0.339)
16	0.0552	0.125	0.0981	0.0627	0.0564	0.013	0.0275	-0.0374
	(0.315)	(0.73)	(0.662)	(0.439)	(0.412)	(0.102)	(0.216)	(-0.378)
17	0.0175	0.0943	0.0531	0.0346	0.0195	-0.0421	-0.0385	-0.11
	(0.0858)	(0.495)	(0.319)	(0.231)	(0.138)	(-0.327)	(-0.311)	(-1.1)
18	0.177	0.168	0.126	0.0681	0.0221	-0.0113	-0.0284	-0.0976
	(1.01)	(0.968)	(0.866)	(0.554)	(0.183)	(-0.0994)	(-0.264)	(-1.11)

Table C.1 (cont'd)
Panel D Number of reviews >=10

Look-back period	holding period 1	2	3	6	9	12	18	24
3	0.0178	0.0799	0.0575	-0.0194	0.00909	0.0227	-0.00284	0.0127
	(0.0732)	(0.36)	(0.286)	(-0.118)	(0.0613)	(0.156)	(-0.0203)	(0.0898)
4	0.414*	0.329**	0.357**	0.246*	0.26**	0.301***	0.252***	0.271***
	(1.97)	(2.03)	(2.01)	(1.73)	(2.57)	(3.15)	(2.64)	(3.02)
5	0.491**	0.492**	0.473**	0.442***	0.413***	0.383***	0.354***	0.346***
	(2.25)	(2.21)	(2.26)	(2.78)	(3.27)	(3.08)	(2.97)	(2.99)
6	0.512**	0.393*	0.372*	0.39***	0.341***	0.285**	0.288**	0.295***
	(2.11)	(1.75)	(1.88)	(2.67)	(2.82)	(2.38)	(2.57)	(2.71)
7	0.222	0.306*	0.381**	0.332***	0.287**	0.241**	0.258**	0.257**
	(1.14)	(1.82)	(2.61)	(2.71)	(2.48)	(2.12)	(2.51)	(2.56)
8	0.208	0.315**	0.329***	0.237**	0.232**	0.195*	0.212**	0.196**
	(1.36)	(2.47)	(2.71)	(2.16)	(2.24)	(1.95)	(2.39)	(2.31)
9	0.338***	0.309***	0.289***	0.202*	0.173*	0.146*	0.151*	0.146*
	(2.95)	(2.84)	(2.73)	(1.99)	(1.85)	(1.68)	(1.9)	(1.9)
10	0.329***	0.324***	0.273**	0.238**	0.191**	0.17*	0.144*	0.14*
	(2.9)	(2.86)	(2.32)	(2.32)	(2.06)	(1.97)	(1.8)	(1.81)
11	0.256**	0.194	0.219*	0.174	0.137	0.119	0.0968	0.0951
	(2.04)	(1.44)	(1.97)	(1.63)	(1.37)	(1.25)	(1.09)	(1.11)
12	0.0985	0.186	0.171	0.111	0.0728	0.062	0.04	0.0503
	(0.576)	(1.57)	(1.45)	(1.02)	(0.7)	(0.63)	(0.416)	(0.547)
13	0.248**	0.25**	0.238*	0.127	0.124	0.119	0.105	0.107
	(2.06)	(2.02)	(1.92)	(1.11)	(1.16)	(1.12)	(1.02)	(1.1)
14	0.22	0.166	0.141	0.0445	0.0487	0.0518	0.0654	0.0595
	(1.49)	(1.16)	(1.04)	(0.355)	(0.405)	(0.436)	(0.551)	(0.53)
15	0.267**	0.231**	0.174	0.0892	0.087	0.0693	0.106	0.0884
	(2.17)	(2.12)	(1.57)	(0.825)	(0.846)	(0.663)	(1.04)	(0.933)
16	0.16	0.0788	0.00243	-0.00999	0.00667	0.00307	0.046	0.0334
	(1.23)	(0.679)	(0.0204)	(-0.0891)	(0.0607)	(0.0268)	(0.412)	(0.326)
17	-0.0447	-0.0758	-0.0267	-0.0322	-0.0135	-0.00611	0.0377	0.0226
	(-0.375)	(-0.586)	(-0.213)	(-0.27)	(-0.112)	(-0.0494)	(0.316)	(0.203)
18	-0.0264	0.00821	0.0588	0.000868	-0.00623	0.0138	0.0234	0.00129
	(-0.155)	(0.0555)	(0.375)	(0.00616)	(-0.044)	(0.0947)	(0.167)	(0.00973)

Table C.1 (cont'd)
Panel E Number of reviews >= 15

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.178	-0.0576	-0.146	-0.101	-0.0696	-0.0795	-0.113	-0.0786
	(-0.72)	(-0.241)	(-0.626)	(-0.473)	(-0.345)	(-0.411)	(-0.601)	(-0.414)
4	0.253	0.25	0.277	0.258	0.315**	0.352***	0.301**	0.327***
	(1.29)	(1.37)	(1.44)	(1.61)	(2.48)	(2.9)	(2.52)	(2.89)
5	0.426*	0.375	0.339	0.391*	0.407**	0.381**	0.352**	0.347**
	(1.75)	(1.5)	(1.29)	(1.94)	(2.51)	(2.39)	(2.24)	(2.29)
6	0.485	0.382	0.347	0.427**	0.377**	0.311**	0.295*	0.286*
	(1.57)	(1.34)	(1.44)	(2.34)	(2.42)	(2.03)	(1.97)	(1.95)
7	0.213	0.285	0.344**	0.341**	0.298**	0.236*	0.232*	0.225*
	(0.974)	(1.63)	(2.16)	(2.4)	(2.24)	(1.82)	(1.89)	(1.85)
8	0.226	0.282*	0.27*	0.198	0.179	0.152	0.15	0.148
	(1.52)	(1.91)	(1.96)	(1.66)	(1.63)	(1.46)	(1.55)	(1.6)
9	0.231	0.273*	0.296**	0.164	0.149	0.13	0.118	0.125
	(1.5)	(1.99)	(2.26)	(1.41)	(1.4)	(1.32)	(1.31)	(1.45)
10	0.27**	0.296**	0.217	0.146	0.108	0.112	0.0995	0.0942
	(2.14)	(2.25)	(1.57)	(1.21)	(0.977)	(1.11)	(1.05)	(1)
11	0.318**	0.189	0.146	0.0859	0.0749	0.0945	0.0798	0.0798
	(2.5)	(1.34)	(1.16)	(0.726)	(0.661)	(0.875)	(0.778)	(0.787)
12	0.0429	0.0654	0.0733	0.00551	-0.00159	-0.0113	-0.0223	-0.0139
	(0.271)	(0.552)	(0.571)	(0.045)	(-0.0134)	(-0.0983)	(-0.194)	(-0.123)
13	0.166	0.235	0.229	0.13	0.129	0.128	0.135	0.146
	(1.14)	(1.58)	(1.47)	(0.827)	(0.833)	(0.833)	(0.917)	(1.02)
14	0.166	0.111	0.091	0.00163	-0.0174	-0.00812	0.0131	0.0172
	(1.05)	(0.691)	(0.57)	(0.0105)	(-0.118)	(-0.055)	(0.0905)	(0.123)
15	0.173	0.207	0.157	0.0955	0.103	0.0911	0.133	0.121
	(1.31)	(1.5)	(1.09)	(0.687)	(0.796)	(0.707)	(1.08)	(1.04)
16	0.154	0.0926	0.0635	0.0628	0.0845	0.0827	0.135	0.122
	(1.04)	(0.612)	(0.419)	(0.447)	(0.617)	(0.611)	(1.05)	(1.01)
17	-0.0616	-0.0286	-0.0251	-0.0142	0.0147	0.0216	0.0569	0.0356
	(-0.368)	(-0.181)	(-0.16)	(-0.0998)	(0.105)	(0.157)	(0.431)	(0.283)
18	-0.0106	-0.0206	0.00906	0.0356	0.0527	0.094	0.0728	0.0567
	(-0.067)	(-0.132)	(0.0608)	(0.26)	(0.387)	(0.701)	(0.569)	(0.462)

Table C.1 (cont'd)
Panel F Number of reviews >=5 Price >= 5

Look-back period	holding period 1	2	3	6	9	12	18	24
3	0.126	0.114	0.126	0.0704	0.128**	0.138**	0.0913*	0.0999*
	(0.895)	(1.02)	(1.33)	(0.979)	(2.18)	(2.45)	(1.67)	(1.88)
4	0.168	0.114	0.134	0.106	0.145**	0.141**	0.0931	0.109*
	(1.03)	(0.903)	(1.13)	(1.22)	(2.19)	(2.41)	(1.63)	(1.97)
5	0.333**	0.249*	0.184	0.163*	0.21***	0.188***	0.177***	0.175***
	(2.22)	(1.78)	(1.47)	(1.68)	(2.78)	(2.71)	(2.72)	(2.76)
6	0.378**	0.295*	0.248*	0.303***	0.289***	0.248***	0.24***	0.23***
	(2.18)	(1.98)	(1.91)	(2.94)	(3.37)	(2.91)	(3.01)	(2.89)
7	0.203	0.297**	0.295**	0.329***	0.305***	0.265**	0.266***	0.242**
	(1.24)	(2.19)	(2.35)	(3.1)	(2.92)	(2.6)	(2.9)	(2.63)
8	0.127	0.194*	0.226**	0.241***	0.22**	0.174**	0.163***	0.144**
	(1.08)	(1.82)	(2.34)	(2.72)	(2.61)	(2.3)	(2.69)	(2.45)
9	0.223*	0.231**	0.281***	0.261***	0.225**	0.187**	0.161**	0.148**
	(1.92)	(2.4)	(3.02)	(2.77)	(2.57)	(2.46)	(2.51)	(2.41)
10	0.212**	0.217**	0.238**	0.216**	0.167*	0.131*	0.103	0.0903
	(2.23)	(2.2)	(2.37)	(2.34)	(1.92)	(1.74)	(1.53)	(1.38)
11	0.202*	0.19	0.173	0.17	0.109	0.0883	0.0705	0.0569
	(1.72)	(1.57)	(1.48)	(1.59)	(1.11)	(0.993)	(0.837)	(0.689)
12	0.14	0.175	0.215*	0.174	0.134	0.122	0.0817	0.0763
	(0.966)	(1.45)	(1.83)	(1.57)	(1.3)	(1.24)	(0.868)	(0.837)
13	0.199*	0.227**	0.196*	0.127	0.121	0.0995	0.0598	0.0588
	(1.76)	(2.16)	(1.98)	(1.34)	(1.34)	(1.14)	(0.721)	(0.733)
14	0.196**	0.171*	0.174*	0.124	0.134	0.127	0.0839	0.0888
	(2.08)	(1.92)	(1.91)	(1.41)	(1.61)	(1.54)	(1.07)	(1.16)
15	0.158*	0.128	0.125	0.093	0.103	0.0695	0.0406	0.0533
	(1.92)	(1.58)	(1.49)	(1.11)	(1.31)	(0.897)	(0.559)	(0.746)
16	0.149	0.128	0.0818	0.0913	0.0853	0.0447	0.0288	0.0268
	(1.56)	(1.33)	(0.797)	(0.956)	(0.912)	(0.486)	(0.331)	(0.312)
17	0.142	0.0746	0.0605	0.057	0.0431	0.00802	0.00631	0.00397
	(1.35)	(0.684)	(0.576)	(0.569)	(0.435)	(0.083)	(0.0676)	(0.043)
18	0.0481	0.0551	0.0605	0.049	0.014	0.00226	-0.0113	-0.0159
	(0.414)	(0.484)	(0.533)	(0.457)	(0.132)	(0.0218)	(-0.112)	(-0.16)

*,**,*** indicate statistical significance at 10%,5%,1%

Table C.2 Robustness check for monthly four-factor alphas based on overall score change

Panels in this table report, for robustness check purpose, the alphas after adjusting risk with Fama-French-Carhart four-factor model for declining-improving portfolios based on the change of overall score. Two types of robustness checked is performed. One check is performed by dividing the whole period into three periods. The other type of check is to change the price cutoff and number of reviews cutoff for a stock being considered in portfolio construction.

Panel A Period June 2008-December 2011

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.408	-0.291	-0.0447	-0.0347	-0.0206	-0.00311	-0.108	-0.0112
	(-1.23)	(-1.1)	(-0.185)	(-0.224)	(-0.152)	(-0.0226)	(-0.842)	(-0.0944)
4	0.0834	0.199	0.202	0.147	0.159	0.158	0.0508	0.148
	(0.305)	(0.773)	(0.753)	(0.784)	(0.948)	(0.949)	(0.352)	(1.07)
5	0.419	0.342	0.431*	0.262	0.273*	0.232	0.232*	0.266**
	(1.45)	(1.27)	(1.76)	(1.46)	(1.78)	(1.64)	(1.85)	(2.25)
6	0.574*	0.539**	0.479**	0.289*	0.324**	0.255*	0.303***	0.281**
	(1.79)	(2.32)	(2.23)	(1.73)	(2.12)	(1.84)	(2.69)	(2.57)
7	0.0757	0.432*	0.466**	0.396**	0.398**	0.363**	0.467***	0.362**
	(0.278)	(1.7)	(2.14)	(2.12)	(2.23)	(2.21)	(3.2)	(2.54)
8	0.234	0.307	0.276	0.25	0.24	0.197	0.325***	0.26**
	(0.98)	(1.43)	(1.32)	(1.37)	(1.47)	(1.44)	(2.84)	(2.52)
9	0.0965	0.0638	0.126	0.19	0.201	0.144	0.269**	0.196*
	(0.439)	(0.305)	(0.656)	(1.17)	(1.31)	(1.06)	(2.27)	(1.74)
10	0.0751	0.0859	0.118	0.206	0.0653	0.135	0.194*	0.144
	(0.392)	(0.485)	(0.654)	(1.32)	(0.449)	(1.07)	(1.78)	(1.35)
11	0.172	0.15	0.221	0.239	0.108	0.149	0.214*	0.155
	(0.875)	(0.7)	(1.1)	(1.37)	(0.692)	(1.13)	(1.72)	(1.3)
12	0.179	0.279	0.297	0.159	0.0958	0.134	0.165	0.17
	(0.798)	(1.32)	(1.52)	(0.908)	(0.601)	(1.06)	(1.36)	(1.51)
13	0.198	0.232	0.273	0.0229	0.0907	0.0871	0.134	0.153
	(0.825)	(1.03)	(1.31)	(0.132)	(0.615)	(0.73)	(1.17)	(1.41)
14	0.42*	0.364	0.318	0.106	0.178	0.219	0.26**	0.277**
	(1.84)	(1.7)	(1.58)	(0.576)	(1.09)	(1.61)	(2.03)	(2.3)
15	0.0642	0.0329	-0.0137	-0.0608	0.0125	0.0568	0.122	0.162
	(0.275)	(0.18)	(-0.0757)	(-0.344)	(0.0791)	(0.408)	(0.908)	(1.27)
16	-0.0706	-0.106	-0.176	-0.0944	-0.0354	-0.0293	0.0976	0.103
	(-0.36)	(-0.522)	(-0.848)	(-0.492)	(-0.196)	(-0.195)	(0.651)	(0.718)
17	-0.241	-0.316	-0.29	-0.1	-0.0193	0.0338	0.136	0.106
	(-1.07)	(-1.37)	(-1.44)	(-0.516)	(-0.1)	(0.204)	(0.848)	(0.702)
18	-0.535**	-0.405*	-0.259	-0.185	-0.119	-0.0059	0.0799	0.00845
	(-2.24)	(-1.72)	(-1.13)	(-0.802)	(-0.52)	(-0.0299)	(0.426)	(0.0458)

Table C.2 (cont'd)
Panel B Period January,2010-December,2013

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.0251	0.0947	0.139	0.0715	0.129*	0.0535	0.0296	0.0488
	(-0.135)	(0.689)	(1.25)	(0.836)	(1.98)	(0.777)	(0.55)	(1.37)
4	0.161	0.216	0.18	0.0964	0.0818	0.0599	0.0455	0.054
	(0.94)	(1.42)	(1.24)	(0.795)	(0.859)	(0.693)	(0.665)	(0.946)
5	0.303	0.271	0.163	0.152	0.118	0.131	0.0984	0.103
	(1.39)	(1.38)	(0.853)	(1.02)	(0.93)	(1.13)	(1.03)	(1.24)
6	0.248	0.243	0.206	0.224	0.125	0.123	0.0995	0.0898
	(1.16)	(1.22)	(1.08)	(1.5)	(0.893)	(0.923)	(0.925)	(0.921)
7	0.222	0.141	0.231	0.269**	0.204	0.166	0.163	0.113
	(1.32)	(0.822)	(1.46)	(2.16)	(1.63)	(1.34)	(1.63)	(1.19)
8	0.112	0.158	0.211	0.246**	0.159	0.131	0.105	0.0991
	(0.629)	(1.04)	(1.53)	(2.13)	(1.38)	(1.24)	(1.25)	(1.27)
9	0.295	0.326*	0.329*	0.31**	0.262*	0.209	0.156	0.136
	(1.59)	(1.94)	(1.99)	(2.26)	(1.96)	(1.65)	(1.47)	(1.33)
10	0.149	0.245*	0.25*	0.267**	0.216*	0.154	0.144	0.0877
	(0.935)	(1.79)	(1.87)	(2.09)	(1.78)	(1.4)	(1.61)	(0.956)
11	0.178	0.247*	0.247*	0.306**	0.258**	0.207*	0.142	0.132
	(1.2)	(1.89)	(1.78)	(2.33)	(2.13)	(1.89)	(1.51)	(1.3)
12	0.247	0.3**	0.331**	0.347**	0.276**	0.24**	0.197*	0.173
	(1.55)	(2.06)	(2.23)	(2.44)	(2.11)	(2.03)	(1.95)	(1.59)
13	0.339*	0.379**	0.364**	0.325**	0.263**	0.219*	0.156	0.142
	(2)	(2.29)	(2.17)	(2.18)	(2.03)	(1.82)	(1.42)	(1.2)
14	0.415**	0.422***	0.382**	0.281**	0.257**	0.213*	0.165	0.108
	(2.68)	(2.83)	(2.58)	(2.16)	(2.21)	(2)	(1.65)	(0.997)
15	0.392**	0.301**	0.296**	0.23*	0.217**	0.203**	0.157	0.105
	(2.67)	(2.06)	(2.18)	(1.92)	(2.02)	(2.05)	(1.62)	(1.01)
16	0.331**	0.293**	0.273*	0.219*	0.242**	0.212**	0.181*	0.14
	(2.34)	(2.13)	(1.95)	(1.8)	(2.25)	(2.08)	(1.82)	(1.32)
17	0.228*	0.126	0.082	0.132	0.166	0.131	0.178	0.0645
	(1.74)	(0.884)	(0.569)	(1.04)	(1.44)	(1.19)	(1.61)	(0.618)
18	0.135	0.00976	0.0176	0.111	0.133	0.109	0.0935	0.043
	(0.805)	(0.0618)	(0.119)	(0.875)	(1.13)	(0.957)	(0.837)	(0.396)

Table C.2 (cont'd)
Panel C January2012-December 2015

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.212	-0.119	-0.0377	0.056	0.0835	0.101	0.0525	0.0799
	(-1.29)	(-0.801)	(-0.352)	(0.558)	(0.996)	(1.22)	(0.67)	(1.06)
4	-0.193	-0.162	-0.135	-0.112	-0.0566	-0.0476	-0.0627	-0.056
	(-1.43)	(-1.32)	(-1.12)	(-1.17)	(-0.631)	(-0.577)	(-0.81)	(-0.737)
5	-0.217	-0.0794	-0.0703	-0.0638	-0.0193	-0.0435	-0.0669	-0.067
	(-1.38)	(-0.554)	(-0.544)	(-0.539)	(-0.175)	(-0.43)	(-0.706)	(-0.712)
6	-0.0224	0.0963	0.0542	0.0652	0.0608	0.0345	0.00505	-0.00774
	(-0.148)	(0.735)	(0.488)	(0.727)	(0.842)	(0.53)	(0.0845)	(-0.138)
7	0.153	0.16	0.156	0.145*	0.107	0.0659	0.0578	0.0321
	(1.25)	(1.46)	(1.61)	(1.94)	(1.5)	(0.933)	(0.873)	(0.531)
8	0.275**	0.22**	0.207**	0.196**	0.14*	0.113	0.114	0.0909
	(2.46)	(2.2)	(2.25)	(2.62)	(1.94)	(1.64)	(1.65)	(1.49)
9	0.312*	0.326**	0.318**	0.264***	0.206**	0.205**	0.166*	0.138*
	(2.01)	(2.55)	(2.57)	(2.7)	(2.3)	(2.37)	(1.96)	(1.84)
10	0.319**	0.296**	0.284**	0.19*	0.187*	0.159	0.124	0.072
	(2.35)	(2.23)	(2.29)	(1.82)	(2.02)	(1.64)	(1.32)	(1.06)
11	0.338**	0.307**	0.268**	0.158	0.177*	0.137	0.0931	0.0584
	(2.17)	(2.38)	(2.22)	(1.55)	(1.79)	(1.34)	(0.997)	(0.878)
12	0.265*	0.216*	0.217*	0.183*	0.204*	0.158	0.121	0.0866
	(1.95)	(1.86)	(1.92)	(1.73)	(1.99)	(1.49)	(1.3)	(1.11)
13	0.234	0.198	0.152	0.127	0.107	0.0664	0.0177	-0.0247
	(1.48)	(1.39)	(1.13)	(1.1)	(0.941)	(0.584)	(0.188)	(-0.351)
14	0.0773	0.1	0.0948	0.103	0.0742	0.0329	-0.0199	-0.0645
	(0.555)	(0.724)	(0.708)	(0.797)	(0.565)	(0.246)	(-0.178)	(-0.722)
15	0.00656	0.0333	0.0247	0.00238	0.000645	-0.0233	-0.0682	-0.113
	(0.0449)	(0.253)	(0.189)	(0.0176)	(0.00459)	(-0.169)	(-0.595)	(-1.14)
16	0.00691	0.0911	0.0793	0.053	0.0563	0.000965	-0.0573	-0.0913
	(0.057)	(0.735)	(0.679)	(0.41)	(0.431)	(0.00795)	(-0.591)	(-1.06)
17	0.166	0.11	0.102	0.066	0.0619	-0.0158	-0.0416	-0.0876
	(1.14)	(0.724)	(0.693)	(0.456)	(0.456)	(-0.132)	(-0.376)	(-0.941)
18	0.248	0.226	0.165	0.129	0.0745	-0.00247	-0.0287	-0.0616
	(1.68)	(1.43)	(1.2)	(1.03)	(0.63)	(-0.0243)	(-0.304)	(-0.722)

Table C.2 (cont'd)
Panel D Number of reviews >= 10

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.0941	-0.163	-0.126	-0.047	-0.029	-0.0434	-0.0686	-0.0198
	(-0.356)	(-0.682)	(-0.598)	(-0.263)	(-0.171)	(-0.255)	(-0.403)	(-0.115)
4	0.241	0.168	0.233	0.276*	0.29**	0.304***	0.239**	0.282***
	(1.22)	(0.998)	(1.26)	(1.84)	(2.55)	(2.82)	(2.19)	(2.72)
5	0.376**	0.34*	0.356*	0.366**	0.335***	0.295**	0.269**	0.295**
	(2.07)	(1.88)	(1.91)	(2.51)	(2.72)	(2.45)	(2.28)	(2.58)
6	0.385	0.355*	0.361*	0.297*	0.279**	0.251*	0.281**	0.306**
	(1.65)	(1.77)	(1.95)	(1.95)	(2.05)	(1.88)	(2.2)	(2.42)
7	0.185	0.249	0.313*	0.285*	0.256*	0.196	0.249*	0.263**
	(0.993)	(1.46)	(1.99)	(1.93)	(1.82)	(1.42)	(1.92)	(2.05)
8	0.233	0.301**	0.313**	0.192	0.168	0.115	0.175	0.179*
	(1.59)	(2.22)	(2.42)	(1.52)	(1.4)	(0.989)	(1.64)	(1.72)
9	0.393***	0.339**	0.296**	0.203*	0.171	0.144	0.17*	0.178*
	(3.01)	(2.53)	(2.34)	(1.67)	(1.5)	(1.34)	(1.77)	(1.87)
10	0.236	0.237	0.232	0.154	0.0786	0.0745	0.0878	0.11
	(1.59)	(1.62)	(1.58)	(1.2)	(0.656)	(0.66)	(0.819)	(1.05)
11	0.305**	0.29*	0.24*	0.183	0.135	0.107	0.0992	0.129
	(2.02)	(1.87)	(1.77)	(1.32)	(1.01)	(0.843)	(0.831)	(1.12)
12	0.2	0.22	0.214	0.153	0.125	0.103	0.0899	0.115
	(1.23)	(1.57)	(1.49)	(1.12)	(0.962)	(0.857)	(0.789)	(1.05)
13	0.242*	0.283*	0.305**	0.172	0.149	0.134	0.131	0.143
	(1.75)	(1.84)	(2.01)	(1.19)	(1.1)	(1.05)	(1.07)	(1.2)
14	0.324**	0.307**	0.263*	0.144	0.124	0.111	0.123	0.124
	(2.14)	(2.13)	(1.83)	(1.04)	(0.972)	(0.903)	(1.03)	(1.08)
15	0.342**	0.239*	0.187	0.112	0.0963	0.0892	0.116	0.117
	(2.35)	(1.7)	(1.32)	(0.813)	(0.764)	(0.711)	(0.936)	(0.972)
16	0.0879	0.0727	0.0417	0.0299	0.0463	0.032	0.0738	0.0837
	(0.577)	(0.497)	(0.283)	(0.22)	(0.352)	(0.24)	(0.56)	(0.66)
17	0.0818	0.0802	0.0692	0.0714	0.0804	0.045	0.0958	0.0997
	(0.546)	(0.537)	(0.495)	(0.532)	(0.605)	(0.339)	(0.735)	(0.791)
18	0.0656	0.0716	0.105	0.0486	0.0394	0.00721	0.0638	0.0612
	(0.351)	(0.418)	(0.604)	(0.31)	(0.251)	(0.0459)	(0.415)	(0.411)

Table C.2 (cont'd)
Panel E Number of reviews >= 15

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.0449	-0.13	-0.177	0.00783	0.0392	-0.00157	-0.0687	0.000318
	(-0.181)	(-0.585)	(-0.939)	(0.0495)	(0.286)	(-0.0117)	(-0.523)	(0.0024)
4	0.0741	0.00593	0.068	0.239	0.294**	0.287**	0.201*	0.255**
	(0.339)	(0.0317)	(0.389)	(1.63)	(2.54)	(2.47)	(1.78)	(2.44)
5	0.206	0.224	0.295	0.435**	0.407***	0.357**	0.335**	0.345**
	(0.923)	(0.987)	(1.24)	(2.37)	(2.72)	(2.41)	(2.33)	(2.5)
6	0.409	0.446*	0.429*	0.444**	0.392**	0.327**	0.33**	0.351**
	(1.39)	(1.77)	(1.9)	(2.49)	(2.49)	(2.1)	(2.19)	(2.36)
7	0.305	0.312	0.367*	0.361**	0.299*	0.23	0.269*	0.285*
	(1.29)	(1.51)	(1.9)	(2.06)	(1.78)	(1.36)	(1.67)	(1.79)
8	0.116	0.205	0.211	0.126	0.0661	0.0521	0.0858	0.108
	(0.841)	(1.47)	(1.6)	(1.04)	(0.572)	(0.449)	(0.812)	(1.06)
9	0.291*	0.239	0.232	0.099	0.0573	0.0507	0.0906	0.13
	(1.87)	(1.5)	(1.48)	(0.722)	(0.454)	(0.418)	(0.823)	(1.22)
10	0.0493	0.112	0.0907	-0.0172	-0.0575	-0.0354	0.0109	0.0527
	(0.27)	(0.639)	(0.532)	(-0.116)	(-0.409)	(-0.264)	(0.0852)	(0.426)
11	0.226	0.241	0.131	0.05	0.0407	0.0435	0.0765	0.119
	(1.52)	(1.56)	(0.9)	(0.347)	(0.295)	(0.336)	(0.633)	(1.04)
12	0.138	0.0596	0.0445	-0.018	-0.00292	0.00229	0.0344	0.0709
	(0.863)	(0.404)	(0.283)	(-0.119)	(-0.0201)	(0.0167)	(0.263)	(0.563)
13	-0.00668	0.0117	0.0427	-0.0456	-0.0206	-0.0239	0.0193	0.0437
	(-0.0444)	(0.0713)	(0.257)	(-0.28)	(-0.131)	(-0.156)	(0.131)	(0.306)
14	0.0799	0.0982	0.0584	-0.000645	0.000755	0.0281	0.0615	0.0747
	(0.456)	(0.57)	(0.332)	(-0.00378)	(0.00463)	(0.174)	(0.393)	(0.49)
15	0.24	0.171	0.0907	0.0548	0.0799	0.0951	0.138	0.153
	(1.49)	(1.04)	(0.529)	(0.352)	(0.551)	(0.667)	(1)	(1.16)
16	0.0966	0.0697	0.0326	0.0307	0.0709	0.0754	0.129	0.137
	(0.556)	(0.385)	(0.186)	(0.19)	(0.466)	(0.503)	(0.904)	(0.989)
17	0.0825	0.0841	0.0402	0.0267	0.0677	0.0713	0.124	0.122
	(0.44)	(0.478)	(0.23)	(0.171)	(0.449)	(0.478)	(0.852)	(0.851)
18	-0.0484	-0.0016	0.00251	0.0406	0.0608	0.0679	0.0935	0.0989
	(-0.281)	(-0.00899)	(0.0148)	(0.267)	(0.401)	(0.45)	(0.631)	(0.687)

Table C.2 (cont'd)
Panel F Number of reviews >=5 Price >= 5

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.0457	-0.0688	0.0423	0.0455	0.0612	0.0621	0.0146	0.0236
	(-0.249)	(-0.476)	(0.346)	(0.526)	(0.823)	(0.888)	(0.222)	(0.362)
4	0.23	0.206	0.196	0.14	0.15*	0.145**	0.0842	0.108
	(1.37)	(1.62)	(1.58)	(1.43)	(1.81)	(2)	(1.18)	(1.53)
5	0.386**	0.256*	0.212	0.155	0.161*	0.14*	0.134*	0.143*
	(2.41)	(1.84)	(1.65)	(1.47)	(1.85)	(1.73)	(1.8)	(1.96)
6	0.379**	0.292**	0.242**	0.193**	0.181**	0.15*	0.163**	0.164**
	(2.24)	(2.31)	(2.16)	(2.09)	(2.18)	(1.89)	(2.35)	(2.38)
7	0.126	0.266**	0.276***	0.265***	0.245**	0.196**	0.217**	0.191**
	(0.954)	(2.42)	(2.74)	(2.75)	(2.51)	(2.06)	(2.58)	(2.29)
8	0.215**	0.22**	0.216**	0.21**	0.18**	0.138*	0.157**	0.139**
	(2)	(2.13)	(2.11)	(2.3)	(2.06)	(1.78)	(2.49)	(2.34)
9	0.229*	0.201*	0.215**	0.2**	0.179*	0.138*	0.138*	0.126*
	(1.94)	(1.85)	(2.1)	(2.13)	(1.97)	(1.7)	(1.98)	(1.94)
10	0.204**	0.2*	0.232**	0.184*	0.123	0.103	0.0969	0.1
	(2)	(1.95)	(2.18)	(1.83)	(1.27)	(1.23)	(1.31)	(1.43)
11	0.297**	0.263**	0.217*	0.218*	0.151	0.122	0.126	0.137*
	(2.43)	(2.1)	(1.83)	(1.96)	(1.48)	(1.36)	(1.54)	(1.74)
12	0.219	0.236*	0.223*	0.201*	0.138	0.13	0.128	0.143*
	(1.66)	(1.85)	(1.78)	(1.68)	(1.29)	(1.37)	(1.45)	(1.67)
13	0.192	0.194	0.18	0.098	0.0682	0.0541	0.0572	0.0708
	(1.42)	(1.46)	(1.45)	(0.867)	(0.724)	(0.636)	(0.731)	(0.93)
14	0.31**	0.266**	0.235*	0.13	0.117	0.108	0.108	0.126
	(2.35)	(2.13)	(1.98)	(1.2)	(1.25)	(1.19)	(1.25)	(1.49)
15	0.165	0.12	0.0838	0.0383	0.0574	0.0412	0.0519	0.0729
	(1.32)	(1.04)	(0.747)	(0.356)	(0.576)	(0.423)	(0.549)	(0.782)
16	0.134	0.0789	0.0343	0.0367	0.0551	0.0235	0.0485	0.0557
	(1.15)	(0.681)	(0.286)	(0.337)	(0.526)	(0.23)	(0.487)	(0.567)
17	0.0566	0.00457	-0.0246	0.00786	0.0304	0.00186	0.0328	0.0417
	(0.441)	(0.0332)	(-0.193)	(0.0667)	(0.266)	(0.0167)	(0.294)	(0.377)
18	-0.061	-0.0797	-0.0662	-0.0259	-0.0312	-0.0462	-0.0222	-0.0164
	(-0.383)	(-0.531)	(-0.455)	(-0.185)	(-0.225)	(-0.337)	(-0.164)	(-0.121)

*, **,*** indicate statistical significance at 10%,5%,1%

Table C.3 Monthly 4-factor alphas for declining-improving portfolios of most recommended and least recommended firms of alternative definition

Panels in this table report the alphas of Declining-improving portfolios for most and least recommended firms of alternative definition after adjusting risk with Fama-French-Carhart four-factor model. In this alternative definition, a firm is classified as most recommended firm if its average job recommendation scores of both previous look-back period and current look-back period are less or equal to their medians. A firm is classified as a least recommended firm if its average job recommendation scores of both pervious look-back period and current look-back period is larger than their medians.

Panel A Most recommend firms

		holding period							
		1	2	3	6	9	12	18	24
Look-back period	3	-0.09	0.0278	0.0696	0.0309	0.0863	0.126	0.106	0.0885
		(-0.407)	(0.151)	(0.434)	(0.244)	(0.802)	(1.25)	(1.06)	(0.899)
	4	0.246	-0.00589	-0.103	-0.0197	0.0987	0.0873	0.0613	0.0459
		(1.26)	(-0.0369)	(-0.746)	(-0.185)	(1.15)	(1.14)	(0.858)	(0.654)
	5	-0.0431	-0.0931	-0.0609	0.138	0.237**	0.204**	0.158*	0.125
		(-0.217)	(-0.514)	(-0.396)	(1.09)	(2.48)	(2.38)	(1.85)	(1.48)
	6	0.0234	0.0397	0.136	0.277**	0.257***	0.209**	0.199**	0.164*
		(0.114)	(0.231)	(0.874)	(2.33)	(2.79)	(2.4)	(2.32)	(1.91)
	7	0.0621	0.211	0.359**	0.402***	0.373***	0.325***	0.316***	0.273***
		(0.351)	(1.32)	(2.54)	(3.59)	(3.67)	(3.44)	(3.59)	(3.1)
	8	0.0714	0.249*	0.211	0.321***	0.304***	0.253***	0.216**	0.154*
		(0.463)	(1.75)	(1.58)	(2.76)	(2.95)	(2.69)	(2.58)	(1.87)
	9	0.307*	0.339**	0.307**	0.37***	0.318***	0.265***	0.216**	0.15*
		(1.79)	(2.43)	(2.34)	(3.09)	(2.97)	(2.72)	(2.48)	(1.79)
	10	0.475***	0.419***	0.446***	0.422***	0.352***	0.329***	0.248***	0.185**
		(3.47)	(3.42)	(3.45)	(3.45)	(3.43)	(3.55)	(2.84)	(2.2)
	11	0.279	0.346**	0.373**	0.364***	0.329***	0.324***	0.234**	0.163*
		(1.59)	(2.19)	(2.63)	(2.92)	(3.11)	(3.31)	(2.59)	(1.86)
	12	0.463***	0.448***	0.372***	0.297**	0.308***	0.302***	0.212**	0.152*
		(2.68)	(3.1)	(2.77)	(2.59)	(2.98)	(2.99)	(2.25)	(1.74)
	13	0.332**	0.272*	0.197	0.186*	0.252**	0.224**	0.13	0.0959
		(2.06)	(1.75)	(1.48)	(1.71)	(2.61)	(2.3)	(1.43)	(1.17)
	14	0.239	0.196	0.19	0.248**	0.298***	0.259***	0.161*	0.123
		(1.34)	(1.39)	(1.54)	(2.45)	(3.06)	(2.7)	(1.77)	(1.49)
	15	0.232	0.2	0.179	0.256**	0.247**	0.184*	0.0925	0.0521
		(1.41)	(1.55)	(1.55)	(2.44)	(2.44)	(1.92)	(1.09)	(0.679)
	16	0.242*	0.141	0.0846	0.217*	0.19*	0.118	0.0435	0.0177
		(1.88)	(1.09)	(0.69)	(1.98)	(1.81)	(1.2)	(0.511)	(0.227)
	17	0.000919	-0.0334	0.05	0.17	0.133	0.0759	0.0104	-0.00828
		(0.00664)	(-0.246)	(0.398)	(1.34)	(1.08)	(0.657)	(0.0992)	(-0.0871)
	18	0.00679	0.0774	0.193	0.191	0.127	0.072	-0.000918	-0.0276
		(0.0451)	(0.532)	(1.35)	(1.31)	(0.922)	(0.555)	(-0.00755)	(-0.244)

Table C.3 (cont'd)
Panel B Least recommended firms

Look-back period	holding period 1	2	3	6	9	12	18	24
3	-0.00232	0.163	0.246	0.162	0.13	0.0788	0.0489	0.0428
	(-6.89e-3)	(0.575)	(0.977)	(0.984)	(0.829)	(0.512)	(0.329)	(0.29)
4	-0.0993	0.0374	-0.0242	0.0785	-0.0788	-0.05	-0.081	-0.0923
	(-0.367)	(0.161)	(-0.113)	(0.469)	(-0.497)	(-0.334)	(-0.544)	(-0.645)
5	0.0822	0.257	0.264	0.087	0.0447	0.056	0.0783	0.0338
	(0.338)	(1.05)	(1.26)	(0.526)	(0.343)	(0.482)	(0.724)	(0.323)
6	0.508*	0.392	0.218	0.061	0.00318	-0.0117	0.0369	-0.00564
	(1.9)	(1.57)	(1.01)	(0.346)	(0.0208)	(-0.0836)	(0.272)	(-0.0414)
7	-0.0927	-0.122	-0.101	-0.175	-0.238	-0.236*	-0.154	-0.155
	(-0.397)	(-0.54)	(-0.513)	(-0.993)	(-1.62)	(-1.77)	(-1.2)	(-1.19)
8	-0.278	-0.205	-0.189	-0.22	-0.183	-0.16	-0.0994	-0.111
	(-1.08)	(-0.891)	(-0.844)	(-1.2)	(-1.22)	(-1.18)	(-0.764)	(-0.854)
9	-0.116	-0.0891	-0.0495	-0.193	-0.167	-0.102	-0.117	-0.104
	(-0.547)	(-0.439)	(-0.251)	(-1.24)	(-1.23)	(-0.761)	(-0.921)	(-0.854)
10	0.136	0.135	0.0976	-0.0352	0.012	0.0191	-0.0223	-0.0267
	(0.542)	(0.547)	(0.471)	(-0.211)	(0.0778)	(0.125)	(-0.144)	(-0.189)
11	-0.0264	(-2.19e-4)	-0.0775	-8.86e-4	0.0343	0.0209	-0.0103	-0.0319
	(-0.13)	(-1.18e-3)	(-0.463)	(-5.53e-3)	(0.219)	(0.134)	(-0.0676)	(-0.245)
12	0.00172	-6.13e-4	0.0157	0.0176	0.027	-0.0157	-0.0618	-0.11
	(0.00895)	(-3.41e-3)	(0.093)	(0.11)	(0.165)	(-0.101)	(-0.407)	(-0.835)
13	0.0817	0.0923	0.135	0.0608	0.0343	0.0142	-0.0259	-0.069
	(0.313)	(0.464)	(0.702)	(0.328)	(0.186)	(0.0801)	(-0.152)	(-0.473)
14	0.0519	-0.0211	0.0649	0.027	0.0704	0.0765	0.0366	-0.00834
	(0.31)	(-0.148)	(0.402)	(0.151)	(0.401)	(0.447)	(0.213)	(-0.0567)
15	0.282	0.0832	0.135	0.00301	0.104	0.0604	0.0557	-0.0108
	(1.19)	(0.443)	(0.663)	(0.0155)	(0.576)	(0.343)	(0.304)	(-0.069)
16	-0.0248	-0.0721	-0.0705	-0.127	-0.0228	-0.0442	-0.0161	-0.08
	(-0.0877)	(-0.337)	(-0.314)	(-0.655)	(-0.12)	(-0.232)	(-0.0796)	(-0.457)
17	0.083	-0.174	-0.12	-0.0193	-0.0348	-0.0323	-0.0424	-0.12
	(0.3)	(-0.775)	(-0.536)	(-0.105)	(-0.188)	(-0.174)	(-0.225)	(-0.686)
18	0.0123	-0.0774	0.0113	0.0981	0.0204	0.0379	-7.74e-05	-0.0433
	(0.0406)	(-0.338)	(0.0489)	(0.517)	(0.109)	(0.195)	(-4.22e-3)	(-0.246)

*,**,*** indicate statistical significance at 10%,5%,1%

APPENDIX D DEFINITIONS, MORE FIGURES AND TABLES FOR CHAPTER 2

Definition of firm characteristics:

Market capitalization = fiscal year end price * number of common shares

$$\text{Tobin'q} = \frac{\text{total asset} + \text{market capitalization} - \text{common stock equity}}{\text{total asset}}$$

$$\text{Leverage} = \frac{\text{total debt}}{\text{total asset}}$$

$$\text{Sales growth} = \frac{\text{sale}_t}{\text{sale}_{t-1}}$$

$$\text{Return on asset} = \frac{\text{ebdita}_t}{\text{total asset}_{t-1}}$$

$$\text{Research and development} = \frac{\text{Research and development}_t\text{(in compustat)}}{\text{total asset}_{t-1}}$$

$$\text{Dividend yield} = \frac{\text{common dividend}_t}{\text{market capitalization}_t}$$

Table D.1 Impact on glass door rating changes with propensity score matching only

This table lists the average treatment effect on the treated (ATT) of the 6-month average rating changes from before the hedge fund activism campaign to after the hedge fund activism campaign. The 6-month average ratings before the campaign are the average ratings of 6-month periods ending 2 months before the campaign, including the ratings in the 2nd month before the campaign. The nearest neighbor matching is done with propensity score only.

Panel A

Impact on business outlook	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	0.057	-0.0944*	-0.155**	0.0145	-0.123	-0.152	-0.282
T	0.729	-1.75	-2.33	0.202	-1.38	-1.24	-1.3
AI std	0.0782	0.0541	0.0665	0.0719	0.0894	0.123	0.217
p value	0.466	0.0809	0.02	0.84	0.169	0.215	0.195
minimum p value of paired t- test for balancing*	0.195	0.0473	0.0175	0.0261	0.0406	0.0856	0.0853
nTreated/nConroll	39/46	57/66	58/67	44/49	28/31	18/20	7/9
nObs	12615	18364	17910	13310	9167	5325	1784
nDrops	4	3	2	0	0	0	0

Panel B

Impact on job recommendation probability	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	-0.0147	-0.0244	-0.0398	0.0115	-0.0848**	-0.0654	-0.141**
T	-0.397	-0.784	-1.39	0.301	-2.04	-1.25	-2.39
AI std	0.0371	0.0311	0.0286	0.0381	0.0417	0.0522	0.0591
p value	0.691	0.433	0.164	0.764	0.0418	0.21	0.0168
minimum p value of paired t- test for balancing*	0.0234	0.0167	0.000519	0.0332	0.0117	0.00562	0.0595
nTreated/nConroll	67/77	84/94	90/100	76/82	59/63	49/52	36/39
nObs	26180	32124	32025	27828	23835	20064	16431
nDrops	4	4	3	1	1	1	2

Table D.1 (cont'd)
Panel C

Impact on career & opportunity	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	0.0572	-0.077	-0.192*	0.0203	-0.281**	-0.123	-0.418*
t	0.436	-0.775	-1.96	0.173	-2.13	-0.734	-1.74
AI std	0.131	0.0994	0.0981	0.118	0.132	0.167	0.241
p value	0.663	0.438	0.0501	0.863	0.0334	0.463	0.0824
minimum p value of paired t- test for balancing*	0.277	0.114	0.0275	0.0269	0.253	0.0856	0.0853
nTreated/nConroll	40/47	59/69	60/69	46/51	29/32	18/20	7/9
nObs	13284	19215	18809	14015	9668	5662	1934
nDrops	4	3	2	1	0	0	0

Panel D

Impact on compensation & benefits	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	0.0928	-0.0653	-0.118	0.0893	-0.0795	0.00852	-0.0445
t	0.872	-0.792	-1.39	0.965	-0.718	0.0528	-0.149
AI std	0.106	0.0825	0.0848	0.0926	0.111	0.161	0.298
p value	0.383	0.428	0.165	0.335	0.473	0.958	0.881
minimum p value of paired t- test for balancing*	0.277	0.109	0.0199	0.027	0.253	0.0856	0.0853
nTreated/nConroll	40/47	61/71	62/71	47/52	29/32	18/20	7/9
nObs	13248	19189	18782	13991	9621	5618	1907
nDrops	4	3	2	1	0	0	0

*p < 0.1, **p < 0.05, ***p< 0.01
*minimum p value of paired t-test is the minimum of the paired t-tests of continuous firm characteristic variables in the probit model between target firms and non-target firms

Table D.2 Impact on Glassdoor rating changes of 1st additional batch of matchings

This table lists the average treatment effect on the treated (ATT) of the 6-month average rating changes from before the hedge fund activism campaign to after the hedge fund activism campaign. The 6-month average ratings before the campaign are the average ratings of 6-month period ending 2 months before the campaign, including the ratings in the 2nd month before the campaign.

Panel A

	Average rating change for 6-month period ending at						
Impact on business outlook	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	0.00677	-0.091	-0.116	-0.0401	-0.169*	-0.0995	0.413
t	0.0779	-1.19	-1.56	-0.51	-1.67	-0.719	1.01
AI std	0.0869	0.0768	0.0742	0.0787	0.101	0.139	0.407
p value	0.938	0.236	0.118	0.61	0.0942	0.472	0.31
minimum p value of paired t- test for balancing*	0.336	0.246	0.195	0.197	0.379	0.208	0.204
nTreated/nConroll	39/39	57/57	58/58	44/44	28/28	18/18	7/7
nObs	12615	18364	17910	13310	9167	5325	1784
nDrops	4	3	2	0	0	0	0

Panel B

	Average rating change for 6-month period ending at						
Impact on job recommendation probability	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	-0.0328	-0.0336	-0.0564**	0.0205	-0.117***	-0.0604	-0.0731
t	-0.978	-1.03	-2.08	0.6	-2.8	-1.49	-1.4
AI std	0.0335	0.0327	0.0272	0.0341	0.0416	0.0405	0.0522
p value	0.328	0.304	0.0377	0.548	0.00512	0.136	0.162
minimum p value of paired t- test for balancing*	0.191	0.259	0.221	0.12	0.155	0.338	0.195
nTreated/nConroll	67/67	84/84	90/90	76/76	59/59	49/49	36/36
nObs	26180	32124	32025	27828	23835	20064	16431
nDrops	4	4	3	1	1	1	2

Table D.2 (cont'd)
Panel C

Impact on career & opportunity	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	-0.0333	-0.0832	-0.145*	-0.0298	-0.284**	-0.0595	0.27
t	-0.292	-0.923	-1.87	-0.295	-2.49	-0.39	1.5
AI std	0.114	0.0902	0.0777	0.101	0.114	0.152	0.18
p value	0.77	0.356	0.0618	0.768	0.0128	0.697	0.134
minimum p value of paired t- test for balancing*	0.27	0.31	0.191	0.175	0.393	0.283	0.204
nTreated/nConroll	40/40	59/59	60/60	46/46	29/29	18/18	7/7
nObs	13284	19215	18809	14015	9668	5662	1934
nDrops	4	3	2	1	0	0	0

Panel D

Impact on compensation & benefits	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	0.146	-0.0645	-0.109	0.108	-0.158	-0.238	-0.244
t	1.35	-0.844	-1.3	1.05	-1.23	-1.13	-0.558
AI std	0.108	0.0765	0.0839	0.103	0.128	0.21	0.438
p value	0.177	0.399	0.192	0.296	0.217	0.257	0.577
minimum p value of paired t- test for balancing*	0.293	0.352	0.239	0.167	0.305	0.329	0.204
nTreated/nConroll	40/40	61/61	62/62	47/47	29/29	18/18	7/7
nObs	13248	19189	18782	13991	9621	5618	1907
nDrops	4	3	2	1	0	0	0

*p < 0.1, **p < 0.05, ***p< 0.01
*minimum p value of paired t-test is the minimum of the paired t-tests of continuous firm characteristic variables in the probit model between target firms and non-target firms

Table D.3 Impact on Glassdoor rating changes of 2nd additional batch of matchings

This table lists the average treatment effect on the treated (ATT) of the 6-month average rating changes from before the hedge fund activism campaign to after the hedge fund activism campaign. The 6-month average ratings before the campaign are the average ratings of 6-month period ending 2 months before the campaign, including the ratings in the 2nd month before the campaign.

Panel A

Impact on business outlook	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	0.0096	-0.0874	-0.129*	-0.0365	-0.16	-0.182	0.413
t	0.111	-1.28	-1.92	-0.467	-1.54	-1.52	1.01
AI std	0.0863	0.0683	0.0672	0.0782	0.104	0.12	0.407
p value	0.911	0.201	0.0545	0.641	0.125	0.129	0.31
minimum p value of paired t- test for balancing*	0.347	0.248	0.185	0.187	0.4	0.206	0.204
nTreated/nConroll	39/39	57/57	58/58	44/44	28/28	18/18	7/7
nObs	12615	18364	17910	13310	9167	5325	1784
nDrops	4	3	2	0	0	0	0

Panel B

Impact on job recommendation probability	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	-0.0328	-0.0336	-0.0564**	0.0205	-0.117***	-0.0604	-0.0813
t	-0.978	-1.03	-2.08	0.6	-2.8	-1.49	-1.61
AI std	0.0335	0.0327	0.0272	0.0341	0.0416	0.0405	0.0506
p value	0.328	0.304	0.0377	0.548	0.00512	0.136	0.108
minimum p value of paired t- test for balancing*	0.191	0.259	0.221	0.12	0.155	0.338	0.243
nTreated/nConroll	67/67	84/84	90/90	76/76	59/59	49/49	36/36
nObs	26180	32124	32025	27828	23835	20064	16431
nDrops	4	4	3	1	1	1	2

Table D.3 (cont'd)
Panel C

Impact on career & opportunity	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	-0.0333	-0.0832	-0.145*	-0.0672	-0.211*	0.0573	0.27
t	-0.292	-0.923	-1.87	-0.676	-1.88	0.374	1.5
AI std	0.114	0.0902	0.0777	0.0994	0.112	0.153	0.18
p value	0.77	0.356	0.0618	0.499	0.0606	0.708	0.134
minimum p value of paired t- test for balancing*	0.27	0.31	0.191	0.172	0.311	0.272	0.204
nTreated/nConroll	40/40	59/59	60/60	46/46	29/29	18/18	7/7
nObs	13284	19215	18809	14015	9668	5662	1934
nDrops	4	3	2	1	0	0	0

Panel D

Impact on compensation & benefits	Average rating change for 6-month period ending at						
	-9th month	6th month	12th month	18th month	24th month	30th month	36th month
ATT of rating change	0.146	-0.0645	-0.0544	0.107	-0.0869	-0.0257	-0.244
t	1.35	-0.844	-0.685	1.13	-0.727	-0.149	-0.558
AI std	0.108	0.0765	0.0793	0.0952	0.119	0.172	0.438
p value	0.177	0.399	0.493	0.259	0.467	0.881	0.577
minimum p value of paired t- test for balancing*	0.293	0.352	0.171	0.184	0.323	0.308	0.204
nTreated/nConroll	40/40	61/61	62/62	47/47	29/29	18/18	7-Jul
nObs	13248	19189	18782	13991	9621	5618	1907
nDrops	4	3	2	1	0	0	0

*p < 0.1, **p < 0.05, ***p< 0.01
*minimum p value of paired t-test is the minimum of the paired t-tests of continuous firm characteristic variables in the probit model between target firms and non-target firms

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