Proxy contest, interlocking directors and insider trading profitability.

Abstract

We empirically examine whether and how proxy contests affect insider trading profitability in interlocked firms after directors face proxy contests in the target firms. After facing proxy contests, directors face a significant decline in directorships in both target and non-target firms. Using a sample of U.S. companies from 1998-2020, we show the disciplinary effects of proxy contests in interlocked firms. In a difference-in-differences setting, we find that insider trading profitability decreases in the interlocked firms following proxy contests as directors enhance monitoring and improve governance to avoid facing future proxy contests. We conduct a range of robustness tests to confirm that our baseline results remain qualitatively unchanged. Our cross-sectional analyses further show that the reduction in insider trading profitability is due to less information asymmetry, better readability of corporate disclosures, and improved governance mechanisms. Overall, the results display the importance of career concerns for directors in policy spillovers across interlocked firms.

Keywords

Proxy contest, insider-trading profitability, interlocked firms.

1. Introduction:

We examine whether proxy contest in a target firm has spill over effects on other firms. Specifically, we test the effect on the insider trading profitability in interlocked firms, the firms with which a target company shares common directors. Consistent with our predictions, we find that insider trading profitability decreases in interlocked firms following a proxy contest in a target firm. Following prior literature (e.g., Bourveau and Schoenfeld, 2017; Fos, 2017; Edmans, Levit, and Reilly, 2019; Levitt, 2019; Zhang, 2021 ;), we argue that a proxy contest in a target firm may improve the governance mechanisms of interlocked firms either through the common directors or through the common owners. The evidence also suggests that stronger governance reduces information asymmetry (Ajinkya et al., 2005; Armstrong, Balakrishnan, and Cohen, 2012; Dechow et al., 2010; Zhang, 2021; Bourveau and Schoenfeld, 2017). As insider trading profitability is contingent on informational advantage (Cohen, 2012), we predict that insider trading profitability is likely to decline when information environment improves in an interlocked firm.

Proxy contest allows disgruntled shareholders to replace an inefficient board. In this sense, a proxy contest is an important corporate governance mechanism (Manne, 1964). Prior studies show that that proxy contest can be value enhancing for shareholders (Mulherin and Poulsen, 1998; Dodd and Warner, 1983). The evidence suggests that proxy contests can harm directors' careers[1] as more than one-third of the directors of a target firm lose their board seats following a proxy contest (Fos and Tsoutsoura, 2014). Several recent studies also examine how the effect of proxy contest spills over to peer firms. Bourveau and Schoenfeld (2017), for

---

[1] Proxy contests pose a serious threat on the career of the incumbent directors. Empirical evidence shows that in three years following proxy contests, 39% of the directors are not on the boards of the target firms. Even, directorship in other boards also declines by 17% following proxy contests. Overall, directors face a median foregone income of $1.3-$2.9 million until retirement after they lose directorship (Fos and Tsoutsoura, 2014).

instance, find that peer firms facing higher risk of proxy contest issue more voluntary disclosure while Gantchev et al. (2019) find that peer firms' act increases share price ex ante so that the potential gains of activist shareholders decrease. Using a slightly different setting, Zhang (2021) show that interlocked firms improve their governance and information environment following a proxy contest in a target firm. A common theme in these studies is that successful proxy contests have external effects, and they generally improve information environment. Another common theme is that career concerns act as the motivations for improving governance so that they can save their directorship[2] and repair reputational damage[3] (Zhang, 2021)[4].

Given the changes in governance and information environment following a proxy contest, the relative informational advantage of market participants is likely to change as well. Prior literature shows that when firm insiders have informational advantage in a relatively opaque environment, they try to extract private benefits over the outside investors (Bettis et al., 2000; Fishman and Hagerty, 1992; Jagolinzer et al., 2011; Manove, 1989; Rahman et al., 2020; Seyhun, 1986; Agrawal and Nasser, 2012; Aitken et al., 2015). We, therefore, use the proxy contest setting to understand how changes in governance and information environment affect insider trading profitability.

To examine the impact of proxy contests on interlocked firms, specifically insider trading profitability, we obtained 7985 insider trading observations for U.S. firms from 1998 to 2020. We only consider insider purchases to measure insider trading profitability since only purchases have opportunistic motives compared to sales transactions (Lakonishok and Lee,

---

[2] After they face proxy contests, directors are concerned about the market's perceptions of their capabilities. So, they are motivated to implement more positive policy changes, specifically younger and shorter-tenured directors (Zhang, 2021)

[3] Even though directors do not often lose board seats in uncontested elections, proxy contests put them in a unique situation where they are substantially concerned about their careers and reputation. As a result, directors facilitate changes that shareholders desire. As Fama (1980) argues that implicit incentives inspired by career concerns for agents in labour market can substantially reduce moral hazard problems.

[4] Zhang (2021) has empirically shown that positive policy changes are concentrated in firms with interlocking directors who faced higher threat of removal and have strong career incentives.

2001; Jeng et al., 2003). Here, the non-opportunistic motives of insider sales are due to higher litigation costs and regulatory requirements[5] (Cheng and Lo, 2006; Billings and Cedergren, 2015). We conduct difference-in-differences analysis where we match interlocked firms (treated) with control firms from the same Fama and French 48 industries with the closest market capitalization. The key variable of interest is the cumulative abnormal returns for six months (CAR6MONTH). We run regressions for observations covering three years before and three years after a proxy contest. This procedure helps to observe the effect of policy changes. Our results suggest that insider trading profitability decreases in the interlocked firms following the proxy contest. This finding is consistent with the theoretical framework that interlocked directors are motivated to improve governance mechanisms and reduce information asymmetry in the interlocked firms after they face proxy contests in the target firms due to career concerns and reputational damage. To show the robustness of our baseline results, we run regressions with alternative measures and specifications of insider trading profitability that display consistent results with our baseline findings that proxy contests have a negative (disciplinary) effect on insider trading profitability.

To alleviate any endogeneity issues, we conduct a series of additional tests to see the validity of the main results. In our difference-in-differences design, we find that treatment and control firms are not significantly different before the proxy contest, which is crucial to validate parallel trend assumptions. Following Zhang (2021), we also examine whether there is any possibility that our baseline results are mechanically driven by firm-director matching or influenced by some unobservable variables. First, we conduct a falsification test for pseudo proxy contest years. Second, we conduct the endogeneity test for interlocked firms with the pseudo proxy contest target firms. If unobservable firm heterogeneity drives our results, insider

---

[5] Even though sales are mainly driven by liquidity needs and regulatory costs are high for trades involving sales (Lakonishok and Lee, 2001 ; Billings and Cedergren,2015), we considered insider sales to validate our sample construction. Following Carhart (1997), we estimated CAR6MONTH for insider sales and ran regression. There is no significant relationship between CAR6MONTH and TREATMENT_POST. The results indicate that insider sales do not have any exploitative motives.

trading profitability should also decrease in these falsification tests. However, our results indicate that none of the falsification tests shows significant changes in insider trading profitability. These results bolster our baseline findings.

Further, to address any omitted variable bias, we control for additional variables, including director gender (Adams and Ferreira, 2009; Martinez and Rambaud, 2019; Burgess and Tharenou, 2002; Campbell and Minguez-Vera, 2008), CEO remuneration (Rahman et al., 2021), and percentage of directors in interlocked boards. Additionally, we add other governance mechanisms, including institutional investors (Liu, 2014). Our baseline results are robust to a raft of these tests.

In the cross-sectional analysis, we conduct several tests to understand the settings where the effect of the proxy contest on insider trading profitability is more prominent. As the directors face proxy contests in the target firms, we expect these directors, concerned about their career and reputation, to improve the information environment and governance mechanisms in the interlocked firms. We empirically test this conjecture. For the information environment, we conducted several tests. We found that interlocked firms reduce information asymmetry after the proxy contest by disseminating more voluntary information to outside shareholders. We take quarterly management earnings forecasts as the basis of management voluntary information guidance[6] (Lin et al., 2020). This voluntary guideline includes the quantity and quality of disclosures: occurrence, precision, and time horizon. We conduct a sub-sample analysis for each of these disclosure categories. Our results indicate that the decrease in insider trading profitability in interlocked firms is significant only when there is a higher level of management forecast occurrence and precision, and disclosures are available for a longer time horizon. Similarly, we also examine whether interlocked firms disclose more

---

[6] We considered the sub-sample where directors are also the CEOs in the interlocked firms after directors face proxy contests in the target firms. We find no statistically significant relationship between CAR6MONTH and TREATMENT_POST for the sub-sample.

readable annual reports and avoid opaque financial disclosure. Following prior literature (Loughran and Mcdonald, 2014; Boubakar et al., 2019; Bonsell et al., 2017; Rahman et al., 2020), we capture the readability of the annual report disclosures by Fog Index, and Bog Index. The lower (higher) the values of these measures, the higher (lower) the readability. We find that insider trading profitability reduces significantly, as the interlocked firms disclose more readable annual reports.

Next, we examine the governance mechanism role of analyst forecast error on our baseline relationship. We use analyst forecast error as a proxy for information asymmetry. As a lower level of forecast error in the interlocked firms reduce information asymmetry, which insiders might exploit otherwise (Wu, 2018), we expect lower profitability when there is a low level of forecast error. Theoretically, this is an ideal situation for making abnormal insider profit. Consistent with our prediction, we find that the association between proxy contests and insider trading profitability in interlocked firms is negative and statistically significant when there is a lower level of analyst forecast error. These results suggest that better monitoring and governance can reduce insider trading profitability in interlocked firms.

Finally, we conduct the role of common ownership's informativeness role in improving governance mechanisms. We expect the information environment to improve if there is higher presence of common ownership. Consistent with our predictions, we find the association between proxy contest effects and insider trading profitability is negative and statistically significant if there is higher presence of common ownership.

This study contributes to the literature on insider trading profitability and the proxy contest spill over effects in the target firms, particularly where insider trading is viewed negatively. To the best of our knowledge, no previous paper examined how and whether insider trading profitability is reduced in interlocked firms after directors face proxy contests in the

target firms. Our results support theoretical predictions that directors reduce insider trading profitability by improving the information environment and governance mechanisms after facing serious career concerns and reputational damage. Their primary motivation is to show the market that they are keen to improve monitoring activities. To this end, investors can view reduced insider trading profitability positively as insider trading reduces capital market confidence among investors (Bainbridge, 2001). Overall, our results collectively support the prior claim that proxy contests have positive corporate outcomes. We further extend this literature by showing indirectly that interlocked directors reduce information advantage for firm insiders when they face a proxy contest in target firms.

The remainder of the chapter is organized as follows: Section 2 reviews the key literature and section 3 develops our hypotheses. Section 4 describes data, sample selection, and variables construction. Section 5 displays the empirical strategy for our study. Section 6 displays the baseline results, robustness checks, identification strategies and addresses relevant endogeneity issues. Section 7 displays cross-sectional tests. Section 8 discusses additional analyses, and section 9 concludes the chapter.

2. Relevant Literature and Hypothesis Development

2.1 Interlocked directors

Prior literature (Adams and Ferreira, 2007) suggests that one of the important functions of the directors is to advise the management of the firm. Thus, directors are able to influence the policy of a firm. Boards of directors have a fiduciary duty to monitor the operation of publicly traded companies and approve important management decisions. Firms can benefit

from board expertise when members monitor management to reduce agency costs or advise management to improve fundamental operating and financial decisions (Adams and Ferreira, 2007). It is common to have interlocked boards where a board member sits on the board of more than one non-competing firm (Stuart and Yim, 2010). Board interlocking may affect an array of financial and economic outcomes as director's social network and information access to diverse sources (Larcker et al., 2013). Likewise, Bauwman (2011) suggests that directors from interlocked boards may influence the governance practices of firm, which she dubs as 'the influence effect'. For instance, past studies indicate that a board's social network affects variables such as stock returns, cost of debt, capital investments, quality of financial reporting, informed trading, and access to external debt (Larcker et al., 2013; Engelberg et al., 2012; Fracassi, 2017; Intintoli et al., 2018; Cheng et al., 2019; Amore et al., 2019; Hilt, 2018). Overall, the literature suggests that board members in general and interlocked directors in particular are able to influence a firm's policies, which in turn affects its economic outcomes.

2.2 Shareholder activism and proxy contest

Prior theoretical literature suggests that shareholders have several options if they are discontent with management's actions and performance. Levitt (2019) suggests that a shareholder may do one of three things in case she is dissatisfied with the management of a firm. First, she can sell off the shares and exit. This 'walk-away' strategy may send a signal to other shareholders, assuming the share-dump by the activist does not affect the market price non-trivially. However, whether such signalling effect of discontent is going to affect the governance on a sustained basis is not clear ex ante. Second, the activist can attempt to get her voice heard. This could entail communications with the firm's board and management. In response, the management and the board may act upon the advice of the shareholder, or they may completely ignore her. Lastly, the activist may engage in a proxy contest as the last resort

as proxy contests are both costly and may turn out to be unsuccessful. According to Fos (2017), activist shareholders' second most stated goal is to reform corporate governance, while the top priority stems from the undervaluation of the target firms. Prior research shows that successful proxy contests[7] contribute positively to shareholder value of target firms (e.g., Dodd and Warner, 1983; Mulherin and Poulsen, 1998; Fos, 2017). Prior research also suggests that there are positive changes in a firm's governance following a proxy contest. Fos and Kahn (2015) indicate that management alters its corporate policies to decrease the likelihood of further interventions and the associated, adverse consequences (Fos and Kahn 2015; Fos and Tsoutsoura, 2014). Similarly, Fos (2017) shows that firms are more likely to implement policy changes that save directors from getting removed from boards, as proxy contests are directly related to directors' careers and reputational damage. Overall, this literature suggests that proxy contests influence the governance of a firm, affecting its policies and possibly economic outcomes.

3.   Hypothesis Development

Past studies discussed in the previous section points to two implications. First, interlocked directors, informed by their diverse experience and equipped with a potent social network, arguably possess the means and the opportunity to positively affect the governance of a firm. Second, a target firm is likely to improve its governance by changing its policies following a proxy contest. In this section, we extend these implications to interlocked firms. We argue that the proxy contests in a target firm provides an interlocked director the motive for improving the corporate governance. This, in turn, influences the information environment

---

[7]Proxy contests are gaining more popularity since 1992 due to the reforms of the proxy contest rules (Sharara and Hoke-Witherspoon, 1993). The 1992 proxy reforms allowed independent shareholders to engage in communication without the monitoring from SEC. This probably explain why there is an increased frequency of proxy contests since 1992 (Sharara and Hoke-Witherspoon, 1993; Bradley et. al., 2013). Prior literature also shows that activist shareholders especially the hedge funds face limited regulatory constraints and are more effective to exploit proxy contest mechanisms (Brav et al., 2008).

and insider trading profitability in an interlocked firm. In other words, we conjecture that proxy contest in a target firm has a positive externality for interlocked firms. We present our arguments as follows.

Prior literature shows that activist shareholders may play a positive role in improving the corporate governance of a focal firm. We argue that the proxy contests provide better governance in the interlocked firms as the interests of the external stakeholders such as activist shareholders and internal parties such as interlocked directors align. In this line of reasoning, we argue that the effect of activism may not be limited to a focal firm, but also spills over to other firms. Prior studies show that proxy contest in one firm affects its peer firms in the same industry. A strand of the literature shows that shareholder activism can spill over to non-target rival firms through product market competition (Aslan and Kumar, 2016). Likewise, a peer firm may undertake changes in its policy if it is likely to face more shareholder activism. Bourveau and Schoenfeld (2017), for instance, find that firms that face higher risk of being a target, experience improvement in their information environment as they issue more voluntary disclosure. Likewise, managers may adopt policies or actions to increase share price ex ante so that the potential gains of activist shareholders decrease (Gantchev et al., 2019).

In line with these findings, we argue that the corporate governance of a firm is likely to change following a proxy contest in an interlocked firm. As in Zhang (2021), we contend that governance and other associated changes in a firm following a proxy contest is more likely to be traceable because it shares at least one common directors with a target firm. Zhang (2021) shows that a proxy contest in a target firm significantly improves corporate governance in interlocked firms. Specifically, interlocked firms decrease cash holdings, increase shareholders' payout, reduce CEO pay, and have less earnings management. Zhang (2021) argue that the effect is due to the directors' career concern as the directors actively seek to improve the corporate governance practices at the interlocked firms to reduce the probability

of losing their board seats. Such actions are likely to influence the corporate governance practices as prior corporate governance literature suggests that directors can influence the board through their advisory functions (Adams and Ferreira, 2007; Bauwman, 2011).

The mechanism that interlocked directors act due to their career concerns to avoid further proxy contests seems reasonable. One implicit assumption of this line of argument is that any improvement in the corporate governance practices is only due to the pre-emptive actions in the supply side. However, there may be a demand side of the story as well. It is possible that activist shareholders are in contact with the interlocked firms with regard to their concerns. Levitt (2019) suggests that activist shareholders' communication and concern ('voice') affect the governance of a firm and the activist can attempt to get her voice heard. This could entail communications with the firm's board and management. In response, the management and the board may act upon the advice of the activist. Levitt (2019) further shows that voice may be optimal in influencing the governance in the equilibrium. It is thus conceivable that activist shareholders' voice is also at play. Moreover, Edmans, Levit, and Reilly (2019) show that if activist shareholders hold the shares of multiple corporation (e.g., common ownership of both target and interlocked firms), it not only improves governance in one company, it also positively affects other companies in unrelated industries. For, the presence of common ownership makes the threat of proxy contest more potent. Overall, the signal from the demand side is beyond cheap talk (Crawford and Sobel, 1982). We, therefore, argue that the proxy contests provide better governance in the interlocked firms as the interests of the external stakeholders such as activist shareholders and internal parties such as interlocked directors align.

To the extent that governance improves the information environment and reduces the information asymmetry, we argue that insider trading profitability is likely to decrease following a proxy contest. Prior studies suggest that governance mechanisms may improve

information environment. Dechow et al. (2010) suggest that internal governance mechanisms such as strong internal control procedures and managerial turnover mitigate earnings management. Armstrong, Balakrishnan, and Cohen (2012) also find that firm-level information asymmetry decreases following improvement in corporate governance. Ajinkya et al. (2005) find that firms with better corporate governance are more likely to issue management forecast. Moreover, these firms issue these forecasts with greater frequency. Related to this study, Bourveau and Schoenfeld (2017) find that firms that are likely to face shareholders activism act to improve their information environment by issuing more voluntary disclosure. Likewise, Zhang (2021) finds that interlocked firms experience less earnings management following a proxy contest. Overall, these studies suggest that improvement in governance mechanisms following proxy contests are likely to be associated with reduction in information asymmetry and improved information environment. As prior studies show that insiders trade to exploit the informational advantage (Cohen et al., 2012; Ali and Hirshlieifer, 2017), we conjecture that insider trading profitability for an interlocked firm will decrease following a proxy contest.

To empirically examine this prediction, we test the following hypothesis in alternate form:

H1: Other things remaining the same, insider trading profitability for interlocked firms decreases following a proxy contest at a target firm.

4.   Data, variables, and summary statistics

4.1 Data

We examine the effects of proxy contests on insider trading profitability in interlocked firms using a sample of U.S. firms from 1998-2020. We obtain proxy contest information from Securities Data Company (SDC) Platinum. From the Corporate Governance module in SDC Platinum, we obtained the list of the U.S. firms that faced proxy contests from January 1, 1998, to December 31, 2020. After merging proxy contest target firms with the ISS data set, we derive the list of firms that share directors with the target firms, that is, interlocked firms. This process generates 819 target firms and 2908 interlocked firms. These interlocked firms are our treatment sample. To control for size and industry-related heterogeneity, we match treatment firms with control firms from the same Fama and French 48 industries with the closest market capitalization the year before the proxy contest. Figure (1) and Panel C in Table (2) shows the yearly distribution of target and interlocked firms from 1998-2020. Panel B in Table (2) shows the distribution of target and interlocked firms based on industries.

We derive our final sample from merging the Thomson Reuters Insiders Filings dataset with Institutional Shareholder Services (ISS-Formerly called RiskMetrics), Compustat, and CRSP. Our sample starts in 1998, as director-related data were largely missing in ISS before 1998. The initial sample starts with the open market purchase transactions from the Thomson Reuters Insider Filings dataset. We include open market purchase transactions of directors, CEOs, top-level managers, other managers and large shareholders (Lakonishok and Lee, 2001). We consider non-director top-level officials besides directors, as top-level officials are likelier to possess superior private information (Suk and Wang, 2021). We consider only purchase

transactions as only purchases display mostly the exploitative motives of the trades (Jeng et al., 2003). We require insider transactions to include at least 100 shares to eliminate insiders' liquidity motives (Lakonishok and Lee, 2001). This process generates an initial sample of 248,272 purchases from firm insiders. We also require that stock returns, financial data and analyst coverage of the treatment and control firms are available. Next, we exclude regulated firms (SIC codes 4900 to 4999 and 6000-6999) and consider only CRSP stocks with codes 10 and 11. We remove all the missing observations for the control variables. All these filtering procedures yield our regression sample of 7985 insider transactions of U.S. firms from 1998-2020. Panel A in Table (2) shows the construction of our sampling procedure. We winsorized all continuous variables at the 1st and 99th percentiles to minimize the influence of outliers.

[Figure 1 here]

[Table 2 panel A here]

[Table 2 panel B here]

[Table 2 panel C here]

4.2 Variables

4.2.1 Dependent variable: insider trading profitability

Our key measure of insider trading profitability is cumulative abnormal returns (CAR6MONTH) for insider transactions. Following (Seyhun, 1986; Wu, 2018), we consider an investment horizon of six months using the event study approach and Carhart's four-factor model (Carhart, 1997). We consider six months window for insider trading transactions to see

the long-term profitability. Our estimation of CAR assumes the estimation window from -250 to -50 trading days (Wu 2018). The following equations summarize the estimation procedure:

$$R_{i,t} - R_{f,t} = \beta_{0,i} + \beta_{1,i}(R_{m,t} - R_{f,t}) + \beta_{2,i}(SMB_t) + \beta_{3,i}(HML_t) + \beta_{4,i}(MOM_t) + \varepsilon_{i,t} \tag{1}$$

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) = R_{i,t} - [\hat{\beta}_{o,i} + \hat{\beta}_{1,i}(R_{m,t} - R_{f,t}) + \hat{\beta}_{2,i}(SMB_t) + \hat{\beta}_{3,i}(HML_t) + \hat{\beta}_{4,i}(MOM_t)] \tag{2}$$

$$CAR_i(0,T) = \sum_{t=0}^{T} AR_{i,t} \tag{3}$$

In equations (1) and (2), $R_{i,t}$ is the individual stock return for firm i in period t, $R_{f,t}$ is the risk-free return, $R_{m,t}$ is the market return, SMB, HML, and MOM are the size, value, and momentum factors in Carhart's equation. Equation (2) estimates abnormal returns (AR), and equation (3) shows cumulative abnormal returns in 126 days (assuming 21 trading days in a month), indicating a 6-month CAR (CAR6MONTH). To check the robustness, we use Carhart's four-factor model (Carhart, 1997) to check the results with cumulative abnormal returns for three (CAR3MONTH) and twelve months (CAR12MONTH), respectively. In our robustness analyses, we further check the profitability with buy-and-hold abnormal returns for three (BHAR3MONTH), six (BHAR6MONTH) and twelve months (BHAR12MONTH), respectively, using Carhart's four-factor model (Carhart, 1997).

4.2.2 Key Independent Variables:

Following Zhang (2021), we construct our key independent variables: Treatment (TREATMENT) and Post (POST). TREATMENT is a dummy variable that takes a value of 1 if firms share common directors with proxy contest target firms and 0 otherwise. POST is also a dummy variable that takes a value of 1 for observations following the proxy contest announcements and 0 otherwise. The interaction term TREATMENT_POST will capture the

insider trading profitability of the treatment firms compared to the control firms in three years after proxy contests.

4.2.3 Control variables

4.2.3.1 Firm-Level control variables

Following Gao et al. (2014), Wu (2018), Rahman et al. (2021) and Frankel and Li (2004), we include a large set of firm-level control variables. These variables are measured at time t-1. SALES_GROWTH is the average weighted sales growth over the last five years at t-1. AGE is the natural logarithm of the age of firms at time t-1. Prior research suggests that younger firms lack experience and external ties (D'Amato and Falivena, 2019) and tend to invest their resources to consolidate their market positions through different competitive strategies (Withisuphakorn and Jiraporn, 2016) rather than improve governance. RESEARCH is the ratio of research and development expenditures to total assets at time t-1. Insiders gain more in research-intensive firms than firms without research expenses (Aboody and Lev, 2000).

LOSS is an indicator variable that takes a value of 1 if the firm reports a loss in year t-1, and 0 otherwise. LOSS can measure the firm's financial performance, which is a determinant of a firm's internal control problems (Skaife et al., 2013). BTM is the ratio of the book value of equity to the market value of equity at time t-1. Firm insiders tend to purchase stocks showing poor performance and cheap stocks, which is measured by the book-to-market ratio (Lakonishok and Lee, 2001). SIZE is the natural log value of the market value of equity at time t-1. The effectiveness of insider trading activities depends on a firm's size. Larger firms are priced more efficiently than smaller firms. Hence, the benefit of exploiting insider trading activities will be more prominent in smaller firms (Lakonishok and Lee, 2001). Again, firm insiders buy more in small firms and sell more in larger firms (Seyhun, 1986). PAST RETURN

is the cumulative abnormal returns one month (21 trading days) before the insider transaction using Carhart's four-factor model (Carhart, 1997). PAST RETURN implies the presence of undervalued stocks before insiders purchase stocks (Wu, 2018). TURNOVER is the average value of the ratio of trading volume to shares outstanding over one year at t-1. Turnover will capture the intensity of shareholders' interests. VOLATILITY is the standard deviation of the monthly stock returns over the last five years at t-1. Stock volatility is a good predictor of insider trading profitability. As the firm insiders have superior information, volatile and risky stocks will not necessarily be so for the firm insiders (Ravina and Sapienza, 2010; Gao et al., 2014). ANALYST is the natural log value of 1 plus the number of analysts following the firm at time t-1. More number of analysts following a firm is related to reduced insider trading profitability and reduced number of insider purchases (Frankel and Li, 2004)

4.2.3.2 Board-level control variables

We also include a set of board-level control variables. OWNERSHIP is the total percentage of shares that directors own. BOARDSIZE is the total number of directors on the board. BOARDSIZE can impact firms' advising and monitoring functions (Baron and Forst, 2015). INDEPENDENCE is the percentage of independent directors on the board. A higher number of independent directors on the board should improve board monitoring (Baron and Forst, 2015). BUSYNESS is the percentage of independent directors who hold at least three board seats. Director busyness is associated with less effective monitoring (Core et al., 1999) and weaker profitability for firms (Fich and Shivdasani, 2006). DUALITY is an indicator variable that takes a value of 1 if the CEO is also the chairman of the board and 0 otherwise. Duality reduces the monitoring roles of the board over executive members, and thus it can affect the governance mechanisms (Levy, 1981; Dayton, 1984)

4.3 Summary Statistics

Table (3) shows the summary statistics for the main variables used in our empirical analysis. Our variables are within reasonable limits, consistent with our expectations, and broadly with prior studies. Our first panel reports cumulative abnormal returns (CAR6MONTH) for six months (126 days). We find that insiders earn, on average, 5.4% cumulative abnormal return over six months. The returns significantly differ from zero and are broadly consistent with prior studies. For example, Dai et al (2016) reported 6.5% profitability (BHAR) for six months, while Rahman et al (2021) reported profitability of 8.4% (CAR) for six months. Panel 2 shows the summary statistics for firm-level control variables. SIZE, BOARDSIZE and OWNERSHIP have mean values of 8.2, 9.9 and 0.07, respectively. These results are consistent with the study from Zhang (2021), who reports values of 8.46, 9.98 and 0.051 for firm size, board size and ownership, respectively. BOARDSIZE is also consistent with Anderson et al. (2004) who reports board size of 12.1. INDEPENDENCE has a mean value of 0.731, similar to Coles et al. (2014) who reports 0.69. PAST RETURN has a mean value of -0.026, which is consistent with Wu (2018), who reported a value of -0.074 for past returns, which implies the existence of undervalued stocks before purchase by the firm insiders.

[Table 3 here]

Table (4) shows the correlation coefficients for the key variables used in this paper. Cumulative abnormal return (CAR6MONTH) for six months is negatively correlated to the key variable of TREATMENT_POST. CAR6MONTH is also negatively correlated to firm size and board size, indicating that large firms with large board sizes are better at constraining insider trading profitability. Most of the correlations among other variables are statistically significant. We expect larger firms to have a greater number of directors on the boards. We

find the correlation between firm size (SIZE and board size (BOARDSIZE) 0.354 that is consistent with Rahman et al. (2021) who report the correlation coefficient of 0.527.

[Table 4 here]

5. Research design

In this section, we specify the regression model to examine the influence of proxy contests on insider trading profitability in interlocked firms. We run the regression using insider trading profitability (CAR6MONTH) as the dependent variable and TREATMENT_POST as the key explanatory variable.

$$CAR6MONTH_{i,t} = \alpha + \beta_1 TREATMENT_{i,t\_}POST_{i,t} + \beta_2 TREATMENT_{i,t} + \beta_3 POST_{i,t} + \sum \beta_k CONTROLS_{i,t} + \sum INDUSTRY + \sum YEAR + \epsilon_i$$
(4)

Where the above variables have been defined previously.

We include industry and year-fixed effects for controlling any omitted time invariant industry characteristics. Our key variable of interest is the interaction of TREATMENT and POST. Due to career concern, as the directors could implement a better governance mechanism in the interlocked firms, which reduces rent-seeking behaviour for firm insiders, we expect the coefficient estimate of the interaction term is negative. In our regression model β_1 captures this effect compared to those in the control firms following proxy contests.

6. Results

6.1 Matched sample and ex-ante summary statistics: Covariate balance

We initially assess the covariate balance between treatment and control firms for our baseline difference–in–differences settings (Coles et al. 2014). Table (5) shows the ex-ante summary statistics of all firm and board-level variables for treatment and control firms in the year before the proxy contest. We derive control firms by matching treatment firms based on the same Fama and French 48 industries with the closest market capitalization. The estimations indicate that treatment and control firms show no significant difference ex-ante. The pre-contest differences in mean are, in most cases, indistinguishable from zero and are statistically insignificant.[8]

[Table 5 here]

6.2 Baseline regression results

Table (6) shows the regression results for our baseline model. To capture the effect of proxy contests on the interlocked firms, we consider insider trading profitability around three years before and after proxy contests. Standard errors are clustered at the firm level following Petersen (2009). Our key measure of insider trading profitability is CAR6MONTH, and TREATMENT_POST is our key explanatory variable. Column (4) in Table (6) displays the regression results only with the standard board and firm-level control variables. Columns (2) and (3) show the regression estimates using the industry and year fixed effects, respectively. Column (1) displays the results of our baseline model. The estimated coefficients of

---

[8] We conduct the covariate analysis matching treatment firms with control firms. Treatment firms share directors with target firms in the years of proxy contest. Control firms are matched to the treatment firms in the same Fama-French 48 industries with the closest market capitalization in the year before proxy fights. The difference in means in the year before proxy contest and predominantly indistinguishable from zero. We have included all board and firm level characteristics in our regression models to control for the heterogeneity. So, any difference will not significantly affect our baseline results.

TREATMENT_POST are negative and statistically significant in all the specifications. The results of equation (4) show a coefficient of -0.076 with p<0.01 in column (1). The negative coefficient indicates that proxy contests reduce insider trading profitability in interlocked firms. Economically, the estimates in column (1) suggest that for one standard deviation increase in a proxy contest, insider trading profitability decreases by 47.2% for a six-month investment horizon.[9]. Overall, our regression results suggest that interlocked directors implement policy changes (e.g., improved governance and disclosure) in the interlocked firms that reduce insider trading profitability.

[Table 6 here]

6.3 Sensitivity Analysis

In this section, we use some alternative measures for insider trading profitability. To understand the profitability structure both in short and long terms, we also use cumulative abnormal returns for three (CAR3MONTH) and twelve months (CAR12MONTH). The results are reported in columns (1) and (2) of Table (7), respectively. We find that insider trading profitability significantly decreases both for three and twelve months. Further, we also test the robustness of our baseline results using a different specification of our profitability measure. We consider market-Adjusted Buy-And-Hold abnormal returns for three (BHAR3MONTH) six (BHAR6MONTH) and twelve (BHAR12MONTH) months. Results are reported in columns (3) and (4), respectively. We find that our key explanatory variable, TREATMENT_POST, is negative and statistically significant.

[Table 7 here]

---

[9] The standard deviation of TREATMENT_POST is 0.336. For TREATMENT_POST, the coefficient of -0.076 indicates a change in insider trading profitability of around 47.2% (-0.076*0.336/0.054). CAR6MONTH has a mean value of 0.054, as reported in Table (3).

6.4 Validity of empirical design

In this section, we argue that although our difference-in-differences design satisfies the parallel trend assumptions, the results could be mechanical. To address this concern, we perform several tests following prior literature (Zhang, 2021; Rahman et al., 2021; Almeida et al., 2015). Table (8), Panel A shows results for regression estimates for the pseudo proxy contest event years. We arbitrarily set proxy contest years and include three years before and after proxy contests (pseudo proxy contest years) to see the effects in the absence of proxy contests. PSEUDO_POST in the table indicates observations following the pseudo proxy contest years. Column (1) shows the regression estimates for three years before the proxy contest, while Column (2) shows the regression results for three years after the proxy contest. Our TREATMENT_PSEUDO_POST variable is not statistically significant in columns (1) and (2). The coefficient of TREATMENT_PSEUDO_POST indicates that treatment and control firms display similar policy changes in the absence of proxy contests. This result indicates that our difference-in-differences results are not mechanical, and insider trading profitability decreases for the actual proxy contest years.

[Table 8 Panel A here]

Next, we consider the actual years of the proxy contest, however, consider firms that never faced proxy contests as the pseudo target firms. We randomly define these pseudo-treatment firms and follow the same matching procedure to identify the pseudo-control firms. The treatment and control firms are from the same Fama and French 48 industries with matched

market capitalization one year before the proxy contests. The results are reported in Panel B of Table (8). We find that the interaction term PSEUDO_TREATMENT_POST is not statistically significant. This result further supports our baseline results. Collectively, our endogeneity tests show a causal relationship between proxy contests and insider trading profitability in interlocked firms.

[Table 8 Panel B here]

6.5 Omitted variables bias

Our baseline model runs regressions with industry and year-fixed effects to control for any time-invariant industry characteristics. Also, as we control for PAST RETURN, to some extent it reduces the possibility of omitted variable concerns. The argument is that the PAST RETURN and the key insider trading profitability measure (CAR6MONTH) are influenced by the same unobservable characteristics. However, to further establish credence to our baseline results, we control for several other firm-level characteristics and professional attributes of the insiders that could affect insider trading profitability. First, we consider the percentage of female directors (FEMALE) sitting on the interlocked board. The past study suggests that female directors on board improve information quality, monitoring, and governance of the firm (Adams and Ferreira, 2009; Martinez and Rambaud, 2019; Burgess and Tharenou, 2002; Campbell and Minguez-Vera, 2008). Second, we control CEO compensation as it could influence corporate policy and insider trading profitability. We define CEO_COMPENSATION as the natural logarithm of total CEO compensation.

Third, we control for the percentage of directors in the interlocked firms who face proxy fights in the target firms. More directors on the board facing proxy contests will facilitate policy changes better as they are concerned about career and reputational damage. We create a

variable: PERCENTAGE_INTERLOCKED, which is the ratio of interlocked directors who face proxy fights in the target firms and the board size.

Finally, we include additional governance variable: INSTITUTIONAL_INVESTOR. INSTITUTIONAL_INVESTOR is defined as the natural logarithm of the total number of institutional investors in a firm (Liu, 2014; Rahman et al., 2021). Table (9) shows the regression results with all these additional control variables. We find that the estimated coefficients of the TREATMENT_POST variable remain negative and statistically significant.

[Table 9 here]

7. Cross-sectional analyses

In this section, we perform several cross-sectional tests to understand the mechanisms through which insider trading profitability decreases in interlocked firms. We argue that following proxy contests in the target firms, interlocked directors, being concerned about their career, improve disclosure and governance of the firm. Along this line, first, we examine our baseline relationship conditional on management's voluntary disclosures. These disclosures are primarily at the complete discretion of management as to whether and to what extent management will produce information on firms' prospects (Chen and Wei, 2019). We consider this disclosure's occurrence, precision and horizon (voluntary earnings guidance). Second, we examine how the relationship between proxy contests and insider trading profitability varies with firms' quality of public disclosure. We consider the annual report readability for this quality measure. Third, we investigate whether the quality of external disclosure (analysts'

forecast errors) improves in our setting. After the proxy contests in target firms, interlocked firms will have more insider trading restrictions, reducing insider trading profitability.

7.1 Managements' voluntary disclosure

We argue that directors would enhance monitoring in the interlocked firms after they face proxy fights in the target firms. In line with this argument, we expect a significant decrease in insider trading profitability for the interlocked firms as firms increase voluntary disclosures. Voluntary disclosures effectively reduce information asymmetry and agency conflict by disseminating corporate information (Shehata, 2014). Prior studies show that these disclosures reduce monitoring costs and alleviate moral hazard problems (Schipper, 1989). In our setting, interlocked directors will likely attempt to create a positive image after facing the threat of removal. Previous studies also document that firms enhance their image by disclosing voluntary information (Patten, 2002; Hooghiemstra, 2000). Following Lin et al. (2020), this study utilises three dimensions of management's voluntary disclosures: occurrence, precision, and horizon. Prior research suggests that managers provide disclosures to decrease information asymmetry and the cost of capital (Coller and Yohn, 1997; Verrecchia, 2001; Brown et al., 2004).

More significant disclosures can signal directors' ability to monitor governance mechanisms to outsiders (Trueman, 1986) and reduce litigation costs (Skinner, 1994). This is only true when outside investors' and firm insiders' interests are aligned. However, firm insiders are not always willing to disclose to outsiders if they fear that their control may go down if they disclose more (Lo, 2003; Nagar et al., 2003). Under the competing scenario, firm insiders' and outside investors' interests must be aligned so that insiders disclose more to outsiders (Dye, 2001; Cheng and Lo, 2006).

7.1.1 Occurrence

We create a dummy variable (OCCURRENCE) that takes a value of 1 if management issues earnings forecast at least once in a fiscal quarter and otherwise, 0 (Lin et al., 2020). This measure captures the first-order choices on earnings forecasts whether management is keen to disseminate information to outsiders. We argue that the after the proxy contests in target firms, interlocked firms release information more often. To test this conjecture, we split our sample into firm-year with occurrence and non-occurrence of voluntary disclosures. Panel A in Table (10) displays the regression results. Column (YES) of table (10) shows the subsample if firms issued at least one earnings guidance in the fiscal quarter. Column (NO) shows the subsample with no earnings guidance in the fiscal quarter. We find that the estimated coefficient of TREATMENT_POST is negative and statistically significant only for firms where management issue voluntary earnings forecasts at least once in a fiscal quarter. This result suggests that more frequent management disclosures reduce insider trading profitability in treatment firms.

[Table 10 Panel A here]

7.1.2 Precision

Our second component of voluntary disclosure is precision. PRECISION measures the mean precision scores for all quarterly forecasts. The PRECISION score is 4 if the forecasts issue points estimate, while it is 3 if it is for range estimates. Again, the PRECISION score is 2 if the forecasts issue open-ended estimates, 1 for the qualitative statements and 0 if no estimates are forecasted (Lin et al., 2020; Li, 2010). As we expect the information environment to improve in the interlocked firms, the quality of disclosures should also increase. To test the

conjecture, we split our sample into PRECISION scores of 0 to 4. Panel B of Table (10) displays the regression estimates. Column (1) displays the estimates when management issues point estimates for quarterly earnings estimates (HIGH), while column (2) of tables (10) displays regression estimates for the sub-sample where no forecasts are available (LOW). We find that the coefficient of TREATMENT_POST is negative and statistically significant only for the sub-sample where the disclosures had high precision scores. The results suggest that more precise earnings guidance reduces insider trading profitability in interlocked firms.

[Table 10 Panel B here]

7.1.4 Accuracy

Our third component of voluntary disclosure is accuracy. Following Brockman et al. (2008), we create a variable (ACCURACY) which is measured as the absolute difference between the forecasted EPS and the actual EPS scaled by the share price at the end of trading months before the forecast's issuing dates. More accurate earnings guidance suggests the credibility of the information that insiders disseminate to outsiders. To construct our variable, the forecast errors are divided into quintiles and are given scores from 1 to 5 based on the levels of accuracy. ACCURACY score 1 means forecast errors in the top quintiles, whereas ACCURACY score 5 means forecast errors in the bottom quintiles. A higher level of ACCURACY scores implies higher levels of forecast accuracy and a lower level of forecast errors. In our setting, interlocked directors tend to disseminate information of high accuracy to outside investors. To test this conjecture, we divide our sample into HIGH and LOW accuracy groups where HIGH means an ACCURACY score of 5 and LOW means an ACCURACY score of 1. The regression results are tabulated in Panel B of Table (11). We find that the

estimated coefficient of TREATMENT_POST is negative and statistically significant in the high ACCURACY group. This result indicates that interlocked firms disseminate more accurate information to outside investors when threatened with removal from the boards in the target firms.

[Table 10 Panel C here]

7.2 10k reports Readability

Loughran and Mcdonald (2014) argue that annual reports are more opaque when the 10K file size is more extensive. The higher (lower) number of words in the 10-K file makes annual reports less (more) readable (Boubaker et al., 2019). Previous studies indicate that firm insiders can conceal information through a higher level of complexity in their disclosure documents (Li et al., 2013). On the other hand, more readable disclosure documents that are easier to understand (Morris, 2012) act as a device to align the interest of firm insiders and outside investors. There are several proxies available to measure readability. We expect that there will be an increase in disclosure in the interlocked firms following the proxy contest. The increase in disclosure will be in the form of more readable annual reports.

Following Loughran and Mcdonald (2014) and Bonsall et al. (2017), we use 10-k file[10], and Bog[11] indices to measure the readability of annual reports. The higher (lower) number of words in the 10-k file size and higher (lower) values in the Bog index make the financial disclosures less (more) readable. The higher (lower) the value of these measures, the less (more) readable the annual reports are. We create a subgroup for HIGH (LOW) readability based on the 10-k and Bog index. If the values in 10-k file size and Bog indexes are lower

---

[10] 10-k file file size is an easily calculated proxy for readability of financial disclosures.
[11] Bog index is based on writing principles in plain english. It captures the spirits most SEC guidelines in relation to clear communications with the investors (Bonsall et al., 2017).

(higher) than the sample median, readability is higher (lower). Table (11) displays the results. We find that the estimated coefficient of TREATMENT_POST is negative and significant only when the 10-k and Bog index values are low. This implies that interlocked firms have less insider trading profitability for a better quality of public disclosure (more readable annual reports).

[Table 11 here]

7.3 Analyst Forecast errors

Next, we argue that with more quality voluntary and public disclosures, the accuracy of external disclosures improves. This also positively contributes to decreased information asymmetry and insider trading profitability. Prior studies suggest that information asymmetry decreases as analysts' forecast errors decrease (Wu, 2018; Li k, 2020; Luo et al., 2015). To examine the role of analysts, we create a variable (ANALYST_ERROR) which is measured by the absolute difference between actual and mean earnings forecast. We split our sample into HIGH (LOW) groups based on more (less) forecast errors than the sample median. We expect our baseline relationship to hold if the analysts have fewer forecast errors. Table (12) displays the results. We find that the estimated coefficient of TREATMENT_POST is negative and statistically significant only when the forecast errors are low. Overall, these results suggest that an improved information environment in interlocked firms reduces the rent-seeking behaviour of insiders and thus reduces insider trading profitability.

[Table 12 here]

8. Common ownership

Prior paper from Edman et al. (2019) shows that improve governance even though traditional wisdom suggests it otherwise. Common ownership offers investors to have a portfolio of good and relatively bad firms. In times of liquidity needs, the investor would sell the stocks of bad firms first. Thus, the sale can be driven more by informativeness than liquidity shock. The informativeness can enhance governance mechanisms. If the firm have a strong monitoring mechanism, investors will likely hold the stocks, and the other way around if mechanisms are weak. Following prior literature, we use three measures (DENSITY, PCS and C) to determine common ownership (Azar, 2011; Cohen and Frazzini, 2008; Besnahan and Salop, 1986; Kennedy at al., 2017).

The density of common ownership (DENSITY) is the ratio between firm pairs connected to the industry and the maximum number of firm pairs within the industry. The percentage of common stocks (PCF) is the ratio between the maximum number of stocks in the industry with a minimum of one common block holder to the total number of stocks in the industry. The common ownership incentive terms(C) is how much the firms are connected to the industry through common ownership and voting control without depending on the market shares of firms within the industry. We collected data for common ownership from personal website of Andrew Koch[12]. The higher(lower) values of DENSITY, PCF and C make the presence of common ownership more(less) prominent. We create the subgroup for HIGH (LOW) common ownership if the DENSITY, PCF and C values are higher(lower) than the sample median. Table (13) displays the results. We find that the coefficient for TREATMENT_POST is negative and statistically significant when the DENSITY, PCF and C are high. This suggests that the improvements in governance mechanisms are more pronounced for firms with more common ownership.

---

[12] The data is available at https://sites.pitt.edu/~awkoch/CommonOwnershipData.html

[Table 13 here]

9. Conclusion

This study presents extensive evidence to show the relationship between proxy contests and insider trading profitability in interlocked firms using a sample of U.S. firms from 1998-2020. Using a difference-in-difference approach, we find that insider trading profitability declines significantly following proxy contests in the interlocked firms as directors strengthen governance mechanisms and enhance monitoring activities which should reduce information asymmetry. The effects are more pronounced for firms that provide more timely and accurate management quarterly earnings disclosures, and higher readability of the disclosure documents. These changes in governance mechanisms will reduce adverse career prospects that directors fear after facing proxy fights and reduce future dissident activism. Overall, the results indicate that proxy fights will reduce rent-seeking activities. Consistent with prior studies, directors are keen to implement positive policy changes and improve governance in interlocked firms. The improved governance and monitoring reduce insider trading activities. The finding from this study has implications for both regulators and investors and supports further empowerment of shareholders to replace the board of directors through proxy fights.

References

Aboody D and Lev B (2000) Information asymmetry, R&D, and insider gains. *The Journal of Finance* 55(6): 2747-2766.

Adams RB and Ferreira D (2009) Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics* 94(2): 291-309.

Adams RB, Hermalin BE and weisbach MS (2010) The Role of Boards of Directors in Corporate Governance: A Conceptual Framework and Survey. *Journal of Economic Literature* 48(1): 58-107.

Agrawal A and Nasser T (2012) Insider Trading in Takeover Targets. *Journal of Corporate Finance* 18 (3):598-625.

Aitken M, Cumming D, Zhan F (2015) Exchange trading rules, surveillance and suspected insider trading. *Journal of Corporate Finance* 34: 311–330.

Ajinkya B, Bhojraj S and Sengupta P (2005) The Association between Outside Directors, Institutional Investors and the Properties of Management Earnings Forecasts. *Journal of Accounting Research* 43: 343-376.

Ali A, Klasa S and Yeung E (2014) Industry concentration and corporate disclosure policy. *Journal of Accounting and Economics* 58: 240-264.

Ali U and Hirshleifer D (2017) Opportunism as a firm and managerial trait: Predicting insider trading profits and misconduct. *Journal of Financial Economics* 126: 490–515.

Almeida H, Kim CS and Kim HB (2015) Internal Capital Markets in Business Groups: Evidence from the Asian Financial Crisis. *Journal of Finance* 70(6): 2539-2586.

Amihud Y and Stoyanov S (2017) Do staggered boards harm shareholders*? Journal of Finacial Economics* 123(2) : 432–439.

Amore MD , Bennedsen M, Larsen B and Rosenbaum P (2019) CEO education and corporate environmental footprint. *Journal of Environmental Economics and Management* 94:254–273

Anderson RC, Mansi SA and Reeb DM (2004) Board characteristics, accounting report integrity, and the cost of debt. *Journal of Accounting and Economics* 37(3): 315-342.

Armstrong C S, Balakrishnan K and Cohen D (2010a) Corporate governance and the information environment: *evidence from state antitakeover laws*.Working Paper.

Aslan H and Kumar P (2016) The product market effects of hedge fund activism. *Journal of Financial economics* 119: 226-248.

Atawnah N, Balachandran B, Duong HN and Podolski EJ (2018) Does exposure to foreign competition affect stock liquidity? Evidence from industry-level import data. *Journal of Financial Markets* 39:44–67.

Azar J (2011) A new look at oligopoly: Implicit collusion through portfolio diversification. *Unpublished working paper*, Princeton University.

Baginski SP, Conrad EJ and Hassell JM (1993) The Effects of Management Forecast Precision on Equity Pricing and on the Assessment of Earnings Uncertainty. *The Accounting Review*. 68(4):913-927.

Balakrishnan K, Billings MB, Kelly B and Ljungqvist A (2014) Shaping liquidity: on the causal effects of voluntary disclosure. *Journal of Finance* 69: 2237.

Banerjee A, Nordqvist M and Hellerstedt K (2020) The role of the board chair—A literature review and suggestions for future research. *Corporate Governance: An International Review* 28: 372– 405.

Baron L and Forst A (2015) Disproportionate insider control and board of director characteristics. *Journal of Corporate Finance* 35: 62-80.

Bettis JC, Coles JL and Lemmon ML (2000) Corporate policies restricting trading by insiders. *Journal of Financial Economics* 57: 191–220.

Bolton P, Scharfstein DS (1990) A theory of predation based on agency problems in financial contracting. *American Economic Review*: 93–106.

Bonsall SB, Leone AJ, Miller BP and Rennekamp K (2017) A plain English measure of financial reporting readability. *Journal of Accounting and Economics* 63: 329-357.

Boubaker S, Gounopoulos D and Rjiba H (2019) Annual report readability and stock liquidity. *Financial Markets, Institutions and Instruments* 28:159–186.

Bourveau T and Schoenfeld J (2017) Shareholder activism and voluntary disclosure. *Review of accounting Studies* 22:1307-1339.

Bradley M, Brav A, Goldstein I and Jiang W (2010) Activist arbitrage: A study of open-ending attempts of closed-end funds. *Journal of Financial economics* 95(1): 1-19.

Brav A, Jiang W, Partnoy F and Thomas R (2008) Hedge fund activism, corporate governance, and firm performance. *Journal of Finance* 63(4): 1729-1775.

Bresnahan T F and Salop S C (1986) Quantifying the competitive effects of production joint ventures. *International Journal of Industrial Organization* 4 :155-175.

Brockman P, Khurana IK and Martin X (2008) Voluntary disclosures around share purchases. *Journal of Financial Economics* 89: 175-191.

Burgess Z and Tharenou P (2002) Female board directors: characteristics of the few. *Journal of Business Ethics* 37: 39–49.

Cai J, Garner J and Walking R (2009) Electing Directors. *Journal of Finance* 64(5): 2389-2421.

Cain MD, Mckeon SB and Solomon SD (2017) Do takeover laws matter? Evidence from five decades of hostile takeovers. *Journal of Financial Economics* 124: 464-485.

Campbell K and Minguez-Vera A (2008) Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics* 83:435–451.

Chen CCS, Chou YY and Wei P (2020) Country factors in earnings management of ADR firms. *Finance Research Letters 32*.

Choi SJ, Nelson KK and Pritchard AC (2009) The screening effect of the Private Securities Litigation Reform Act. *Journal of Empirical Legal Studies* 6:35–68.

Chowdhury H, Tan KJK and Wang J (2021) Does Annual Report Readability Affect Labor Investment Efficiency? Available at SSRN 3925362.

Cohen, L., Frazzini, A., 2008. Economic links and predictable returns. *The Journal of Finance* 63:1977-2011.

Cohen L, Malloy C and Pomorski L (2012) Decoding inside information. *Journal of Finance* 67: 1009-1043.

Coles JL, Daniel ND and Naveen L (2006) Managerial incentives and risk-taking. *Journal of Financial Economics* 79(2): 431-468.

Coles JL, Daniel ND and Naveen L (2014) Co-opted Boards. *The Review of Financial Studies* 27(6): 1751-1796.

Core J, Holthausen R and Larcker D (1999) Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics* 51:371-406.

Crawford V and Sobel J (1982) Strategic information transformation. *Econometrica* 50: 1431–1451.

Dai L, Fu R, Kang JK and Lee I (2016) Corporate governance and the profitability of insider trading. *Journal of Corporate Finance* 40:235–253.

Dalton DR, Daily CM, Ellstrand AE and Johnson JL (1998) Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic Management Journal* 19(3): 269-290.

D'Amato A and Falivena C (2019) Corporate social responsibility and firm value: Do firm size andage matter? Empirical evidence from European listed companies. *Corporate Social Responsibility and Environmental Management* 27(2): 909-924.

Dayton N (1984) Corporate Governance: The OtherSide of the Coin. *Harvard Business Review* 62: 34-37.

DeAngelo H and DeAngelo L (1989) Proxy contests and the governance of publicly held corporations. *Journal of Financial Economics* 23(1): 29-59.

Demsetz H and Lehn K (1985) The structure of corporate ownership: causes and consequences. *Journal of Political Economy* 93:1155–1177.

Dodd P and Warner JB (1983) On corporate governance: A study of proxy contests. *Journal of Financial Economics* 11(1): 401-438.

Edmans A, Levit D and Reilly D (2019) Governance under common ownership. NBER Working Paper 20420.Engelberg J, Gao P and Parsons CA (2011) Friends with money. *Journal of Financial Economics* 103: 169–188.

Falato A, Dalida K and Ugur L (2014) Distracted directors: Does board busyness hurt shareholder value? *Journal of Financial Economics* 113 (3): 404-426.

Fama EF (1980) Agency Problems and the Theory of the Firm. *Journal of Political Economy* 88(2): 288-307.

Fama EF and French KR (1992) The cross-section of expected stock returns. *The Journal of Finance* 47(2):427-465.

Fracassi C (2017) Corporate finance policies and social networks. *Management Science* 63(8) :2420–2438.

Fich EM and Anil S (2006) Are busy boards effective monitors? *Journal of Finance* 61 (2): 689-724.

Fos V and Kahn C (2015) Governance through threat of intervention and threat of exit. Working paper, University of Illinois at Urbana–Champaign, Champaign.

Fos V and Tsoutsoura M (2014) Shareholder democracy in play: Career consequences of proxy contests. *Journal of Financial Economics* 114 (2): 316-40.

Fos V (2015) The disciplinary effects of proxy contests. *Journal of Management Science* 63(3):655-671.

Frankel R and Li X (2004) Characteristics of a firm's information environment and the information asymmetry between insiders and outsiders. *Journal of Accounting and Economics* 37: 229-259.

Gantchev N (2013) The costs of shareholder activism: Evidence from a sequential decision model. *Journal of Financial Economics* 107 (3): 610-31.

Gao F, Lisic l and Zhang LX (2014) Commitment to social good and insider trading. *Journal of Accounting and Economics* 57(2-3): 149-175.

Gunning R (1952) The technique of clear writing: McGraw-Hill International Book Co, New York, NY.

Hermalin BE and Weisbach MS (2003) Board of directors as an endogenously determined institution: a survey of the economic literature. *Economic policy Review* 9(1): 7-26.

Holmstrom B (1982) Managerial Incentive schemes-a dynamic perspective. *Essays in Economics and management in honour of Lars Wahlbeck*. Swenska Handekshogkolan, Helosinki.

Hooghiemstra R (2000) Corporate Communication and Impression Management – New Perspectives Why Companies Engage in Corporate Social Reporting. *Journal of Business Ethics* 27: 55-68.

Intintoli VJ, Kahle KM and Zhao WL (2018) Director connectedness:Monitoring efficacy and career prospects. *Journal of Financial and QuantitativeAnalysis* 53: 65–108.

Jagolinzer AD, Larcker DF and Taylor DJ (2011) Corporate governance and the information content of insider trades. *Journal of Accounting Research* 49: 1249–1274.

Jeng LA, Metrick A, Zeckhauser R (2003) Estimating the returns to insider trading: a performance-evaluation perspective. *Review of Economics and Statistics* 85: 453-471.

Jensen MC and Meckling WH (1976) Theory of the firm: Managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics* 3:305-360.

Karamanou I and Vafeas N (2005) The Association between Corporate Boards, Audit Committees, and Management Earnings Forecasts: An Empirical Analysis. *Journal of Accounting Research* 43(3): 453-486.

Karuna C, Subramanyam K and Tian F (2012) Industry Product Market Competition and Earnings Management. *American Accounting Association Financial Accounting and Reporting* Section Mid-Year Conference.

Kennedy P, O'Brien DP, Song M and Waehrer K (2017) The competitive effects of common ownership: Economic foundations and empirical evidence. Unpublished working paper, Bates White Economic Consulting.

Koch A, Panayides M and Thomas S (2021) Common ownership and competition in product markets. *Journal of Financial Economics* 139 (1) :109–137

Kock JC, Santalo J and Diestre L (2012) Corporate Governance and the Environment: What Type of Governance Creates Greener Companies? *Journal of Management Studies* 49(3): 492-514.

Kyle AS (1985) Continuous auctions and insider trading. *Econometrica* 53:1315–1336.

Lakonishok, J and Lee I (2001) Are insider trades informative? *The Review of Financial Studies* 14: 79–111.

Lan Y, Wang L and Zhang X (2013) Determinants and features of voluntary disclosure in the Chinese stock market. *China Journal of Accounting Research* 6(4): 265-285.

Larcker DF, EC So, and CCY Wang (2013) Boardroom centrality and firm performance. *Journal of Accounting and Economics* 55 (2–3): 225–50.

Levy L (1981) Reforming Board Reform. *Harvard Business Review* 59: 166-172.

Li F, Li T and Minor D (2016) CEO power, corporate social responsibility, and firm value: a test of agency theory. *International Journal of Managerial Finance* 12(5): 611-628.

Li Q, Luo W, Wang Y and Wu L (2013) Firm performance, corporate ownership, and corporate social responsibility disclosure in China. *Business Ethics: A European Review* 22(2): 159–173.

Liu AZ (2014) Can External Monitoring Affect Corporate Financial Reporting and Disclosure? Evidence from Earnings and Expectations Management. *Accounting Horizons* 28(3):529-559.

Loughran T and Mcdonald B (2014) Measuring Readability in Financial Disclosures. *Journal of Finance* 69: 1643-1671.

Luo X, Wang H, Raithel S and Zheng Q (2015) Corporate social performance, analyst stock recommendations, and firm future returns. *Strategic Management Journal* 36(1): 123–136.

Manne HG (1985) Insider trading and property rights in new information. *Cato Journal* 4: 933–943.

Manove M (1989) The harm from insider trading and informed speculation. *The Quarterly Journal of Economics* 104: 823–845.

Martinez MCP, Oms IB and Sempere GO (2016) Corporate governance, female directors and quality of financial information. *Business Ethics, the Environment & Responsibility* 25: 363-385.

Martinez MCV and Rambaud (2019) Women on corporate boards and firm's financial performance. *Women's Studies International Forum* 76: 102251.

Meulbroek LK (1992) An empirical analysis of illegal insider trading. *Journal of Finance* 47: 1661–1699.

Meulbroek LK (2000) Does risk matter? Corporate insider transactions in internet based firms. *Working Paper: Harvard Business School*.

Morris RD (2012) Signalling, Agency Theory and Accounting Policy Choice. *Accounting and Business Research* 18: 47-56.

Mulherin JH and Poulsen AB (1998) Proxy contests and corporate change: implications for shareholder wealth. *Journal of Financial Economics* 47: 279-313.

Naqvi SK, Shahzad F, Rehman IU and Qureshi F (2020) Corporate social responsibility performance and information asymmetry: The moderating role of analyst coverage. *Corporate Social Responsibility and Environment Management* 28: 1549-1536.

Patten DM (1992) The relation between environmental performance and environmental disclosure: a research note. *Accounting, Organization and Society* 27(8): 763-773.

Peress J (2010) Product market competition, insider trading, and stock market efficiency. Journal of Finance 65: 1–43.

Petersen MA (2009) Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *The Review of Financial Studies* 22(1): 435-480.

Rahman D, Faff R and Oliver B (2021) Does board independence constrain insider opportunism? *Australian Journal of Management* 46(3): 499-522.

Rahman D, Kabir M and Oliver B (2021) Does exposure to product market competition influence insider trading profitability*? Journal of Corporate Finance*: 101792.

Rahman D, Malik I, Ali S and Iqbal J (2021) Do co-opted boards increase insider profitability? *Journal of Contemporary Accounting and Economics* 17(3): 100265.

Rashid A, Shams S, Bose S and Khan H (2020) CEO power and corporate social responsibility (CSR) disclosure: does stakeholder influence matter? *Managerial Auditing Journal* 35(9) .

Ravina E and Sapienza P (2010) What Do Independent Directors Know? Evidence from Their Trading. *The Review of Financial Studies* 23(3): 962-1003.

Rogers JL and Stocken PC (2005) Credibility of management forecasts. *The Accounting Review* 80(4): 1233-1260.

Roulestone, E, Sapienza, P (2003) The relation between insider-trading restrictions and executive compensation. *Journal of Accounting Research* 41(3): 525:551.

Rozeff MS and Zaman MA (1998) Overreaction and insider trading: Evidence from growth and value portfolios. *Journal of Finance* 53: 701–716.

Schipper K (1989) Commentary on earnings management. *Accounting Horizons*: 91.

Schmalz MC (2018) Common-Ownership Concentration and Corporate Conduct." *Annual Review of Financial Economics* 10(1): 413-448

413–48

Schwartz DE (1971) The Public-Interest Proxy Contest: Reflections on Campaign G.M. *The Michigan Law Review Association* 69(3): 419-538.

Seyhun HN (1986) Insider's profits, costs of trading and market efficiency. *Journal of Financial Economics* 16:189-212.

Seyhun HN (1998) Investment Intelligence from Insider Trading. *Journal of Business* 70: 189-216.

Sharara NM and Hoke-Witherspoon E (1993) The evolution of the 1992 Shareholder Communication Proxy Rules and Their Impact on Corporate Governance. *The Business lawyer* 49: 327-358.

Shehata N (2014) Theories and Determinants of Voluntary Disclosure. *Accounting and Finance Research* 3(1): 18-26.

Shleifer A and Vishny R (1986) Large Shareholders and corporate control. *Journal of Political Economy* 20:431-460.

Skaife HA, Veenman D and Wangerin D (2013) Internal control over financial reporting and managerial rent extraction: Evidence from the profitability of insider trading. *Journal of Accounting and Economics* 55(1): 91-110.

Stuart TE and Soojin Y (2010) Board interlocks and the propensity to be targeted in private equity transactions. *Journal of Financial Economics* 97 (1): 174-89.

Suk I and Wang M (2021) Does target firm insider trading signal the target's synergy
Potential in mergers and acquisitions? *Journal of Financial Economics* 142: 1155-1185.

Valta P (2012) Competition and the cost of debt. *Journal of Financial Economics* 105:661-682.

Verrecchia RE (1983) Discretionary disclosure. *Journal of Accounting and Economics* 5: 179-194.

Weisbach M (1988) Outside directors and CEO turnover. *Journal of Financial Economics* 20: 431-460.

Withisuphakorn p and Jiraporn P (2016) The effect of firm maturity oncorporate social responsibility (CSR): Do older firms invest more in CSR? *Applied Economics Letters* 23(4) :298–301.

Wu W (2018) Information Asymmetry and Insider Trading. *Fama-Miller working paper:* 13-67.

Zhang S (2021) Directors' career concerns: Evidence from proxy contests and board interlocks. *Journal of Financial Economics* 140 (3): 894-915.

Appendix

Table 1: Description of variables

Name	Symbol	Description
Panel A: Dependent and independent variables		
Six-month cumulative abnormal returns	CAR6MONTH	Using Carhart's four factor model, we calculated cumulative abnormal returns after 6 months (126 days) of trade.
Key Independent variable	TREATMENT	is equal to 1 if firms share common directors with proxy contest target firms and 0 otherwise
Key Independent variable	POST	is equal to 1 for observations following the proxy contest announcements and 0 otherwise
Key Independent variable	TREATMENT	Is equal to 1 if firms are interlocked firms and 0 otherwise.
Panel B: Firm-level control variables		
Firm Size	SIZE	is the natural log value for the market value of equity at time t-1
Market to book ratio	MTB	is the ratio of the market value of equity to book value of equity at time t-1
Analyst coverage	ANALYST	is the natural log value of 1 plus number of analysts following at time t-1
Firm age	AGE	is natural logarithm of age of firms at time t-1 since it first appeared in CRSP
Sales Growth	SALES_GROWTH	is the average sales growth (Weighted) in the last 5 years at t-1
Research and development	RESEARCH	is the ratio of research and development to total assets at time t-1
Negative income	LOSS	an indicator of 1 if firm reports a loss in year t-1,0 otherwise
Volatility of returns	VOLATILITY	is the standard deviation of the monthly stock returns over the last five years at time t-1
Trade volume	TURNOVER	is the average of the ratio of trading volume over one year to stock outstanding at time t-1
1-month cumulative abnormal returns	PAST RETURN	is the cumulative abnormal return before 1 month (21 days) of trade using Carhart's four factor model.
Panel C: Board-level control variables		
Size of the board	BOARDSIZE	is the total number of directors on the board
Director Busyness	BUSYNESS	is the percentage of directors who are independent and hold at least three directorships
Director independence	INDEPENDENCE	is the percentage of directors who are independent and hold at least three directorships
Director ownership	OWNERSHIP	is the total percentage of shares that directors own
Director duality	DUALITY	is an indicator variable of 1 if CEO is also the chairman of the board and 0 otherwise

Table A1: Time t-1 indicates the past, end of fiscal year observation.

Figure 1: Yearly distribution of target and interlocked firms

Yearly Distribution of Proxy Contest Target and Interlocked Firms
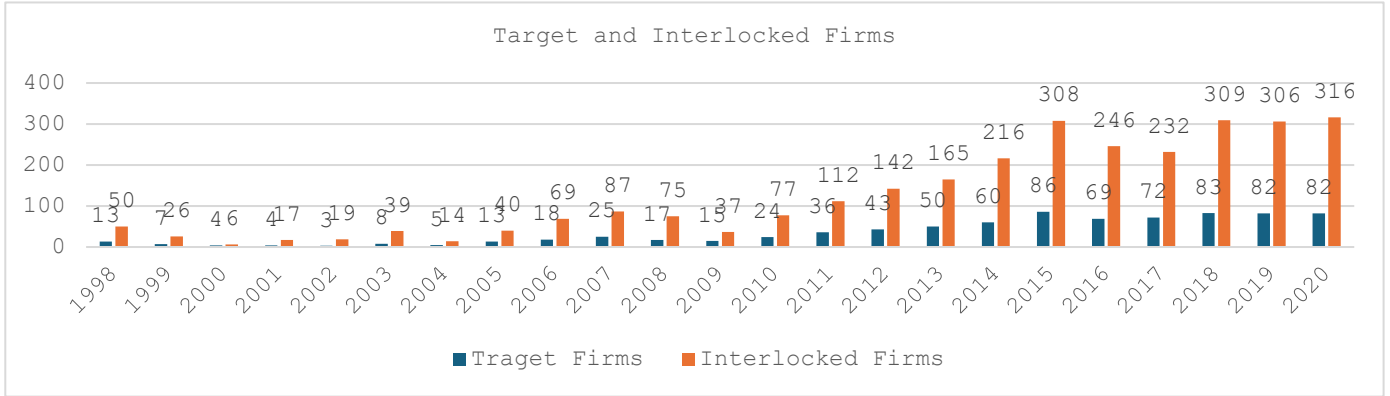
Figure 1: The figure shows the yearly distribution of proxy contest target and interlocked firms. The observations are from 1998 to 2020 consisting of S&P 1500 companies.

Table 2 Target and interlocked firm distribution.

Table (2) Panel A: Process of sample selection

Dataset	Observations
Insider Trading Data from 1998-2020	248872
Merged with: Compustat, CRSP and Analyst data from 1998-2020	136042
Merged with: ISS and Interlocked firm year data	7985

Panel A Table (2) shows the process of sample selection.

Table (2) Panel B: Target and Interlocked Firm distribution by Proxy Contest Years

Year	Frequency	Percent	Frequency	Percent
		Target Firms		Interlocked Firms
1998	13	1.59	50	1.72
1999	7	0.85	26	0.89
2000	4	0.49	6	0.21
2001	4	0.49	17	0.58
2002	3	0.37	19	0.65
2003	8	0.98	39	1.34
2004	5	0.61	14	0.48
2005	13	1.59	40	1.38
2006	18	2.2	69	2.37
2007	25	3.05	87	2.99
2008	17	2.08	75	2.58
2009	15	1.83	37	1.27
2010	24	2.93	77	2.65
2011	36	4.4	112	3.85
2012	43	5.25	142	4.88
2013	50	6.11	165	5.67
2014	60	7.33	216	7.43
2015	86	10.5	308	10.59
2016	69	8.42	246	8.46
2017	72	8.79	232	7.98
2018	83	10.13	309	10.63
2019	82	10.01	306	10.52
2020	82	10.01	316	10.87
Total	**819**	**100**	**2,908**	**100**

Panel B of table (2) shows the distribution of proxy contest target and interlocked firms by proxy contest target firm years. Target and interlocked firms are derived using SDC Platinum.

Table (2) Panel C: Industry-wide Distribution of Proxy Contest Target and Interlocked Firms

Fama and French Industries	Percentage of Target Firms	Percentage of Interlocked Firms
Consumer non-durables	5.53	5.85
Consumer Durables	3.03	3.99
Manufacturing	12.12	19.76
Oil, Gas, and Coal Extraction and Products	8.2	4.86
Chemicals and Allied Products	3.03	6.86
Business Equipment	24.42	15.82
Telephone and Television Transmission	3.39	0.16
Wholesale, Retail, and Some Services	17.83	21.11
Healthcare, Medical Equipment, and Drugs	9.09	6.93
Other	13.37	14.65
Total	**100**	**100**

Panel C of table (2) shows the industry wise distribution of target and interlocked firms. Industries are defined as Fama and French industries.

Table 3: Summary statistics

Name	Observations	Mean	SD	25th Percentile	Median	75th Percentile
Panel 1: Dependent variable						
CAR6MONTH	7985	0.054	0.299	-0.113	0.038	0.191
Panel 2: Key variables						
TREATMENT_POST	7985	0.130	0.336	0	0	0
POST	7985	0.250	0.433	0	0	0
TREATMENT	7985	0.517	0.500	0	1	1
Panel 3: Firm-level variables						
SIZE	7985	8.205	1.196	7.487	8.127	8.931
MTB	7985	2.896	2.207	1.613	2.379	3.509
ANALYST	7985	2.42	0.52	2.03	2.43	2.84
AGE	7985	3.032	0.775	2.575	3.086	3.653
SALES_GROWTH	7985	0.140	0.308	0.029	0.082	0.172
RESEARCH	7985	0.023	0.044	0	0	0.026
LOSS	7985	0.053	0.225	0	0	0
VOLATILITY	7985	0.099	0.049	0.067	0.089	0.122
TURNOVER	7985	0.532	0.654	0.093	0.536	0.972
PASTRETURN	7985	-0.026	0.121	-0.085	-0.019	0.042
Panel 4: Board-level variables						
BOARDSIZE	7985	9.907	2.026	8	10	11
BUSYNESS	7985	0.124	0.124	0	0.1	0.2
INDEPENDENCE	7985	0.731	0.219	0.667	0.8	0.875
OWNERSHIP	7985	0.066	0.102	0.009	0.023	0.067
DUALITY	7985	0.092	0.288	0	0	0

Table (3) shows summary statistics for matched samples of treatment and control firms for 3 years before and after the proxy contests. The key variable of interest is insider trading profitability for 6 months (CAR6MONTH). Treatment firms are defined as firms that share directors with proxy contest target firms and control firms are matched with treatment firms from Fama and French 48 same industries with the closest market capitalization. We used a wide range of control variables including SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Descriptions of all these variables are given in Appendix A1.

Table 4: Pairwise correlations

Table 4: Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) WCAR6MONTH	1																
(2) TREATMENT_POST	-0.016	1															
(3) SIZE	-0.144***	0.047***	1														
(4) PASTRETURN	0.088***	-0.003	-0.003	1													
(5) MTB	-0.114***	0.019*	0.325***	-0.012	1												
(6) RESEARCH	0.006	0.023**	-0.068***	0.002	0.165***	1											
(7) LOSS	0.018*	-0.001	-0.199***	-0.028**	-0.079***	0.270***	1										
(8) AGE	-0.015	0.062***	0.201***	0.016	0.054***	-0.040***	-0.049***	1									
(9) SALES_GROWTH	0.096***	-0.076***	-0.009	-0.036***	-0.015	-0.078***	-0.046***	-0.207***	1								
(10) TURNOVER	0.013	0.072***	-0.085***	0.087***	-0.017	0.086***	0.191***	-0.127***	0.013	1							
(11) VOLATILITY	0.044***	-0.053***	0.344***	-0.052***	-0.100***	0.171***	0.226***	-0.215***	0.169***	0.306***	1						
(12) ANALYST	-0.031***	0.079***	0.656***	0.003	0.196***	0.015	-0.034***	0.054***	0.050***	0.157***	-0.111***	1					
(13) OWNERSHIP	0.071***	-0.001	-0.207***	0.070***	-0.069***	-0.105***	0.007	-0.072***	0.076***	-0.079***	0.073***	-0.133***	1				
(14) DUALITY	-0.038***	-0.041***	-0.029**	0.007	-0.056***	-0.031***	0.01	-0.012	0.058***	-0.066***	0.058***	-0.042***	-0.015	1			
(15) BOARDSIZE	-0.027**	0.017	0.355***	0.011	0.001	-0.176***	-0.140***	0.273***	0.029***	-0.148***	0.133***	0.262***	-0.079***	0.022*	1		
(16) INDEPENDENCE	-0.022**	-0.039***	0.021*	0.046***	0.020*	0.103***	0.053***	0.066***	-0.093***	0.035***	-0.092***	-0.056***	-0.192***	0.020*	0.039***	1	
(17) BUSYNESS	-0.017	-0.01	0.235***	0.037***	0.036***	0.137***	0.001	0.034***	-0.086***	-0.111***	-0.030***	0.150***	-0.144***	0.002	0.141***	0.357***	1

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

Table 5: Covariate Balance in the year before proxy contest

Variables	Observations	Treatment Firms		Control Firms		Difference in Mean	t-stats
		Mean	SD	Mean	SD		
SIZE	3298	8.22	1.47	8.21	0.40	-0.01	(-0.39)
MTB	3298	3.13	2.54	2.86	8.20	-0.26	(-1.25)
ANALYST	3298	2.40	0.59	2.40	0.43	0.01	(0.55)
AGE	3298	3.10	0.82	3.06	0.75	-0.04	(-1.46)
SALES_GROWTH	3298	0.11	0.23	0.13	0.32	0.02	(2.33)
RESEARCH	3298	0.02	0.04	0.03	0.04	0.00	(0.08)
LOSS	3298	0.10	0.30	0.04	0.20	-0.06	(-6.5)
VOLATILITY	3298	0.09	0.05	0.10	0.03	0.00	(0.6)
TURNOVER	3298	0.58	0.60	0.51	0.67	-0.08	(-3.41)
PASTRETURN	3298	-0.02	0.11	-0.02	0.10	0.00	(.22)
BOARDSIZE	3298	9.88	2.06	9.91	1.50	0.02	(.37)
BUSYNESS	3298	0.14	0.12	0.13	0.12	-0.01	(-2.82)
INDEPENDENCE	3298	0.74	0.25	0.74	0.19	0.00	(0.45)
OWNERSHIP	3298	0.05	0.09	0.06	0.09	0.00	(1.31)
DUALITY	3298	0.06	0.22	0.13	0.33	0.07	(7.02)

Table (5): Treatment firms are matched with the control firms from Fama and French same industries in the year before proxy contests. We matched treatment firms with the control firms in terms of SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY Summary statistics are reported separately for treatment, control firms and the difference in treatment and control firms one year before proxy contest. T-statistics are reported in parentheses to show statistical significance of mean differences. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively. Descriptions of all these variables are given in Appendix A1.

Table 6: Baseline Regressions: Proxy contest Interlocked Firms and Insider Trading Profitability

Independent Variables	Dependent Variable: CAR6MONTH			
	(1)	(2)	(3)	(4)
TREATMENT_POST	-0.077***	-0.066**	-0.068**	-0.058*
	(-2.673)	(-2.253)	(-2.194)	(-1.854)
POST	0.045**	0.033*	0.042*	0.029
	(2.192)	(1.712)	(1.900)	(1.430)
TREATMENT	0.050***	0.036**	0.047***	0.033**
	(3.120)	(2.533)	(2.809)	(2.074)
SIZE	-0.056***	-0.058***	-0.054***	-0.057***
	(-5.674)	(-5.734)	(-5.206)	(-5.255)
MTB	-0.012***	-0.011***	-0.010***	-0.010***
	(-3.976)	(-4.076)	(-3.814)	(-3.994)
ANALYST	0.006***	0.006***	0.005***	0.005***
	(3.583)	(3.931)	(3.175)	(3.468)
AGE	0.008	0.009	0.016**	0.016*
	(0.975)	(1.075)	(1.977)	(1.930)
SALES_GROWTH	0.110**	0.117**	0.105**	0.117**
	(2.352)	(2.457)	(2.125)	(2.312)
RESEARCH	0.057	0.059	0.224	0.172
	(0.260)	(0.249)	(1.225)	(0.954)
LOSS	-0.049	-0.046	-0.040	-0.037
	(-1.124)	(-0.985)	(-0.933)	(-0.796)
VOLATILITY	-0.083	-0.219	-0.024	-0.166
	(-0.355)	(-1.066)	(-0.106)	(-0.811)
TURNOVER	-0.007	-0.004	-0.003	-0.001
	(-0.468)	(-0.283)	(-0.217)	(-0.043)
PASTRETURN	0.210***	0.205***	0.214***	0.210***
	(2.987)	(2.764)	(2.899)	(2.680)
BOARDSIZE	0.002	0.002	0.001	0.001
	(0.470)	(0.377)	(0.313)	(0.154)
BUSYNESS	0.066	0.078	0.070	0.078
	(1.089)	(1.308)	(1.167)	(1.336)
INDEPENDENCE	-0.024	-0.019	-0.057	-0.029
	(-0.353)	(-0.585)	(-0.809)	(-0.870)
OWNERSHIP	0.061	0.062	0.066	0.086
	(0.688)	(0.766)	(0.723)	(1.068)
DUALITY	-0.029	-0.040	-0.033	-0.045
	(-1.112)	(-1.461)	(-1.208)	(-1.593)
Constant	0.219*	0.385***	0.269**	0.428***
	(1.916)	(5.193)	(2.040)	(5.150)
Observations	7,985	7,985	7,985	7,985
R-squared	0.112	0.086	0.091	0.063
Year FE	Yes	No	Yes	No
Industry FE	Yes	Yes	No	No
Adjusted R-squared	0.102	0.0791	0.0869	0.0612

Table (6) displays the results from baseline regression using the matched sample of treatment and control firms for three years before and three years after proxy contest. Treatment firms are interlocked firms that share directors with proxy contest target firms. Control firms are matched with the treatment firms from Fama and French 48 same industries with the closest market capitalization. The dependent variable is cumulative abnormal return (CAR6MONTH) for 6 months (126 days). Indicator variable TREATMENT equals 1 if firms share directors with proxy contest target firms and 0 otherwise. Indicator variable POST is 1 for observations after proxy contest and 0 otherwise. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Table 7: Sensitivity Analysis

Independent Variables	Dependent Variables				
	CAR3MONTH	CAR12MONTH	BHAR3MONTH	BHAR6MONTH	BHAR12MONTH
TREATMENT_POST	-0.035**	-0.145***	-0.036**	-0.079**	-0.188***
	(-2.007)	(-2.735)	(-1.969)	(-2.333)	(-2.627)
POST	0.013	0.098***	0.012	0.052**	0.118***
	(0.943)	(3.543)	(0.866)	(2.120)	(2.940)
TREATMENT	0.025***	0.053*	0.022**	0.048**	0.073
	(2.641)	(1.805)	(2.227)	(2.409)	(1.528)
SIZE	-0.032***	-0.086***	-0.033***	-0.058***	-0.097***
	(-6.041)	(-5.466)	(-5.976)	(-5.150)	(-4.740)
MTB	-0.007***	-0.022***	-0.008***	-0.015***	-0.034***
	(-2.760)	(-3.873)	(-2.887)	(-4.245)	(-4.607)
ANALYST	0.003***	0.010***	0.003***	0.006***	0.014***
	(3.535)	(4.082)	(3.381)	(3.190)	(4.287)
AGE	0.007	0.027*	0.008	0.014	0.046**
	(1.307)	(1.694)	(1.422)	(1.360)	(2.095)
SALES_GROWTH	0.074***	0.158**	0.076**	0.124**	0.169**
	(2.609)	(2.491)	(2.277)	(2.055)	(2.144)
RESEARCH	-0.062	0.289	-0.035	0.078	0.012
	(-0.405)	(0.713)	(-0.222)	(0.307)	(0.017)
LOSS	-0.022	-0.013	-0.026	-0.061	-0.109
	(-0.870)	(-0.164)	(-1.044)	(-1.203)	(-0.798)
VOLATILITY	-0.024	-0.486	-0.064	-0.272	-1.896***
	(-0.182)	(-1.220)	(-0.476)	(-0.957)	(-2.930)
TURNOVER	-0.006	-0.012	-0.007	-0.008	0.002
	(-0.675)	(-0.469)	(-0.692)	(-0.481)	(0.050)
PASTRETURN	0.115***	0.255**	0.136***	0.268***	0.416***
	(3.083)	(2.564)	(3.667)	(3.337)	(2.919)
BOARDSIZE	0.002	0.005	0.001	0.004	0.005
	(0.713)	(0.737)	(0.601)	(0.905)	(0.659)
BUSYNESS	0.030	0.191*	0.036	0.053	0.240*
	(0.842)	(1.746)	(0.977)	(0.799)	(1.721)
INDEPENDENCE	-0.006	-0.223**	-0.018	-0.059	-0.319**
	(-0.181)	(-2.205)	(-0.459)	(-0.710)	(-2.164)
OWNERSHIP	0.070	0.108	0.061	0.028	0.179
	(1.485)	(0.838)	(1.236)	(0.259)	(0.939)
DUALITY	-0.024	-0.027	-0.024	-0.032	-0.071
	(-1.363)	(-0.661)	(-1.305)	(-0.980)	(-0.841)
Constant	0.158**	0.273	0.144**	0.190	0.372
	(2.574)	(1.641)	(2.297)	(1.475)	(1.541)
Observations	7,985	7,194	7,985	7,985	7,194
R-squared	0.096	0.124	0.091	0.097	0.106
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.0868	0.114	0.0815	0.0872	0.0956

The table (7) reports the alternative measures of proxy contest interlocking effect and insider trading profitability. We used cumulative abnormal returns for 3months (CAR3MONTH) and 12 months (CAR12MONTH). CAR3MONTH and CAR12MONTH are measured using event study approach for 63 days and 252 days respectively, reported in columns (1) and (2). We used alternative measure of insider trading profitability using buy and hold abnormal returns for 6 months (BHAR3MONTH), 6 months (BHAR6MONTH) and 12 months (BHAR12MONTH). BHAR3MONTH, BHAR6MONTH and BHAR12MOTNH are estimated using event study approach for 63, 126 and 252 days respectively, reported in columns (3) and (4) and (5). Treatment firms are defined as firms that share directors with proxy contest target firms. Control firms are matched with treatment firms from same Fama and French 48 industries with the closest market capitalization. Indicator variable TREATMENT is 1 if firms share directors with target firms and 0 otherwise. Indicator variable POST is 1 for observations after proxy contest and 0 otherwise. We used a number of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Table 8: Validity of empirical design

Panel A: Pseudo Proxy contest Years

Independent Variables	Dependent Variable: CAR6MONTH	
	(1)	(2)
TREATMENT_PSEUDO_POST	0.012	-0.010
	(0.402)	(-0.232)
PSEUDO_POST	-0.017	0.019
	(-0.757)	(1.015)
TREATMENT	-0.002	0.017
	(-0.095)	(0.910)
SIZE	-0.059***	-0.056***
	(-5.095)	(-4.447)
MTB	-0.012***	-0.004
	(-3.105)	(-1.517)
ANALYST	0.007***	0.006***
	(3.516)	(3.344)
AGE	0.045***	0.007
	(3.627)	(0.569)
SALES_GROWTH	0.085*	0.329***
	(1.921)	(4.943)
RESEARCH	0.736***	-0.310
	(3.020)	(-0.872)
LOSS	0.060	-0.034
	(1.467)	(-0.811)
VOLATILITY	-0.284	0.621*
	(-0.887)	(1.951)
TURNOVER	0.039**	-0.026
	(2.366)	(-1.437)
PASTRETURN	0.139**	0.151**
	(1.977)	(2.147)
BOARDSIZE	-0.004	-0.007
	(-0.754)	(-1.429)
BUSYNESS	0.054	0.106
	(0.767)	(1.425)
INDEPENDENCE	0.008	0.004
	(0.118)	(0.050)
OWNERSHIP	-0.199**	0.032
	(-2.336)	(0.341)
DUALITY	0.012	-0.011
	(0.372)	(-0.379)
Constant	0.116	0.497***
	(1.046)	(3.243)
Observations	6,459	5,548
R-squared	0.130	0.152
Year FE	Yes	Yes
Industry FE	Yes	Yes
Adjusted R-squared	0.119	0.139

Table (8) panel A displays the test to understand the relationship between proxy contest effect and insider trading profitability in the interlocked firms. Column (1) displays the regression results for three years before and column (2) shows the estimates for three years after the actual proxy contests. Pseudo proxy contest years of three years before and three years after the actual proxy contests are arbitrarily assumed. Indicator variable TREATMENT takes the value of 1 if firms share directors with the target firms and 0 otherwise. PSEUDO_POST is 1 for observations after the event year. Dependent variable CAR6MONTH is cumulative abnormal return for 6 months (126 days) of purchase transactions. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Table 8: Validity of empirical design

Panel B: Pseudo Proxy contest firms

Independent Variables	Dependent Variable: CAR6MONTH
	(1)
PSEUDO_TREATMENT_POST	0.003
	(0.066)
POST	-0.032
	(-0.914)
PSEUDO_TREATMENT	0.017
	(0.797)
SIZE	0.001
	(0.113)
MTB	-0.060***
	(-5.251)
ANALYST	0.267***
	(3.453)
AGE	-0.002
	(-0.615)
SALES_GROWTH	0.007***
	(3.901)
RESEARCH	0.005
	(0.378)
LOSS	0.088*
	(1.921)
VOLATILITY	-0.359*
	(-1.856)
TURNOVER	-0.037
	(-1.101)
PASTRETURN	-1.009
	(-0.558)
BOARDSIZE	0.033*
	(1.753)
BUSYNESS	0.094
	(1.144)
INDEPENDENCE	0.051
	(0.617)
OWNERSHIP	0.024
	(0.219)
DUALITY	0.031
	(1.086)
Constant	0.298**
	(1.979)
Observations	7,788
R-squared	0.099
Year FE	Yes
Industry FE	Yes
Adjusted R-squared	0.0891

Panel B of table (8) displays the test to understand the causality between proxy contest and board interlocks. PSEUDO_TREATMENT indicates firms that share directors with the pseudo target firms in the proxy contest years. POST is 1 for observations after the event year. Dependent variable CAR6MONTH is cumulative abnormal return for 6 months (126 days) of purchase transactions. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Table 9: Omitted variable bias

Independent Variables	Dependent Variable: CAR6MONTH		
	(1)	(2)	(3)
TREATMENT_POST	-0.066**	-0.077***	-0.065**
	(-2.344)	(-2.659)	(-2.324)
POST	0.047**	0.045**	0.047**
	(2.241)	(2.162)	(2.209)
TREATMENT	0.041**	0.050***	0.041**
	(2.576)	(3.120)	(2.582)
SIZE	-0.055***	-0.037*	-0.036
	(-5.592)	(-1.731)	(-1.641)
MTB	-0.011***	-0.012***	-0.011***
	(-3.708)	(-3.923)	(-3.657)
ANALYST	0.006***	0.006***	0.007***
	(4.129)	(3.794)	(4.381)
AGE	0.010	0.009	0.010
	(1.098)	(1.001)	(1.131)
SALES_GROWTH	0.111**	0.104**	0.105**
	(2.274)	(2.247)	(2.177)
RESEARCH	-0.041	0.053	-0.045
	(-0.187)	(0.242)	(-0.204)
LOSS	-0.054	-0.049	-0.054
	(-1.269)	(-1.103)	(-1.251)
VOLATILITY	-0.125	-0.082	-0.124
	(-0.538)	(-0.346)	(-0.529)
TURNOVER	-0.000	-0.005	0.002
	(-0.019)	(-0.294)	(0.125)
PASTRETURN	0.187***	0.215***	0.192***
	(2.702)	(3.079)	(2.794)
BOARDSIZE	0.004	0.002	0.004
	(1.083)	(0.522)	(1.145)
BUSYNESS	0.061	0.069	0.063
	(1.009)	(1.145)	(1.060)
INDEPENDENCE	-0.015	-0.024	-0.015
	(-0.212)	(-0.353)	(-0.215)
OWNERSHIP	0.062	0.037	0.038
	(0.701)	(0.389)	(0.403)
DUALITY	-0.026	-0.030	-0.027
	(-0.954)	(-1.138)	(-0.981)
CEO_COMPENSATION	-0.018**		-0.018**
	(-2.414)		(-2.392)
PERCENTAGE_INTERLOCKED	0.290*		0.288*
	(1.799)		(1.776)
FEMALE	0.099		0.089
	(0.520)		(0.470)
INSTITITIONAL_INVESTOR		-0.049	-0.049
		(-1.099)	(-1.089)
Constant	0.297**	0.403*	0.481**
	(2.507)	(1.932)	(2.257)
Observations	7,887	7,980	7,882
R-squared	0.112	0.112	0.113
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Adjusted R-squared	0.103	0.103	0.103

Table (9) displays regression results for omitted variables bias. In column (1) we control for CEO_COMPENSATION and PERCENTAGE_INTERLOCKED and FEMALE, In column (2) we control for INSTITUTIONAL_INVESTOR. In column (3) we control for all added variables. FEMALE is the percentage of female directors sitting on the interlocked boards. CEO_COMPENSATION is the natural logarithm of total CEO compensation. PERCENTAGE_INTERLOCKED is the ratio of total directors facing proxy contest in the board to the board size. INSTITUTIONAL_INVESTOR is the natural log value of the number of institutional investors. Indicator variable TREATMENT takes the value of 1 if firms share directors with the target firms and 0 otherwise. POST is 1 for observations after the event year. Dependent variable CAR6MONTH is cumulative abnormal return for 6 months (126 days) of purchase transactions. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

.

Table 10: Cross sectional tests- Voluntary disclosure

Panel A: Occurrence - Proxy contest effect on interlocked firms, occurrence of disclosure and insider trading profitability

Independent Variables	Dependent Variable: CAR6MONTH	
	(YES)	(NO)
TREATMENT_POST	-0.084***	0.026
	(-5.363)	(0.294)
POST	0.046***	-0.002
	(4.111)	(-0.031)
TREATMENT	0.053***	0.077*
	(6.422)	(1.690)
SIZE	-0.053***	-0.105***
	(-11.036)	(-3.979)
MTB	-0.012***	-0.010
	(-6.845)	(-1.025)
ANALYST	0.005***	0.016***
	(5.646)	(3.658)
AGE	0.006	-0.021
	(1.207)	(-0.766)
SALES_GROWTH	0.156***	-0.008
	(11.924)	(-0.212)
RESEARCH	0.159	-0.463
	(1.445)	(-0.599)
LOSS	-0.045***	-0.143**
	(-2.640)	(-2.168)
VOLATILITY	0.099	-2.015***
	(1.005)	(-4.639)
TURNOVER	-0.015**	-0.002
	(-2.024)	(-0.045)
PASTRETURN	0.167***	0.361***
	(6.047)	(3.697)
BOARDSIZE	0.003	-0.032***
	(1.613)	(-2.901)
BUSYNESS	0.062*	0.017
	(1.926)	(0.100)
INDEPENDENCE	0.013	-0.016
	(0.438)	(-0.101)
OWNERSHIP	0.073*	0.284
	(1.850)	(1.646)
DUALITY	-0.035***	0.097**
	(-2.959)	(2.034)
Constant	0.097	1.223***
	(0.958)	(4.031)
Observations	7,328	657
R-squared	0.122	0.379
Year FE	Yes	Yes
Industry FE	Yes	Yes
Adjusted R-squared	0.112	0.306
Difference in coefficients on TREATMENT_POST between YES v NO Occurrence of sub-sample: x^2 (p-value)	28.76***(0.000)	

Panel A of table (10) displays the cross-sectional relationship between proxy contest effects and insider trading profitability in the interlocked firms. Following Lin et al (2020), we grouped firms into occurrence and no-occurrence. In column (YES), we display regression estimates for firms that make earnings guidance at least once in a fiscal quarter and column (NO) shows firms with no earnings guidance. Indicator variable TREATMENT takes the value of 1 if firms share directors with the target firms and 0 otherwise. POST is 1 for observations after the event year. Dependent variable CAR6MONTH is cumulative abnormal return for 6 months (126 days) of purchase transactions. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively

Table 10: Cross sectional tests- Voluntary disclosure

Panel B: Precision - Proxy contest effect on interlocked firms, precision of disclosure and insider trading profitability		
Independent Variables	Dependent Variable: CAR6MONTH	
	(HIGH)	(LOW)
TREATMENT__POST	-0.069***	0.026
	(-4.177)	(0.294)
POST	0.041***	-0.002
	(3.395)	(-0.031)
TREATMENT	0.050***	0.077*
	(5.580)	(1.690)
SIZE	-0.056***	-0.105***
	(-10.796)	(-3.979)
MTB	-0.011***	-0.010
	(-5.040)	(-1.025)
ANALYST	0.005***	0.016***
	(6.071)	(3.658)
AGE	0.003	-0.021
	(0.514)	(-0.766)
SALES_GROWTH	0.178***	-0.008
	(11.074)	(-0.212)
RESEARCH	0.178	-0.463
	(1.474)	(-0.599)
LOSS	-0.049***	-0.143**
	(-2.646)	(-2.168)
VOLATILITY	0.291***	-2.015***
	(2.648)	(-4.639)
TURNOVER	-0.019**	-0.002
	(-2.484)	(-0.045)
PASTRETURN	0.130***	0.361***
	(4.253)	(3.697)
BOARDSIZE	0.002	-0.032***
	(0.666)	(-2.901)
BUSYNESS	0.118***	0.017
	(3.291)	(0.100)
INDEPENDENCE	0.027	-0.016
	(0.817)	(-0.101)
OWNERSHIP	0.069	0.284
	(1.568)	(1.646)
DUALITY	-0.052***	0.097**
	(-3.866)	(2.034)
Constant	0.087	1.223***
	(0.852)	(4.031)
Observations	6,045	657
R-squared	0.144	0.379
Year FE	Yes	Yes
Industry FE	Yes	Yes
Adjusted R-squared	0.132	0.306
Difference in coefficients on TREATMENT_POST between HIGH v LOW Precision of sub-sample: x^2 (p-value)	17.45***(0.000)	

Panel B of table (10) displays the relationship between proxy contest effects and insider trading profitability in the interlocked firms. Following Lin et al., (2020), we grouped firms into HIGH and LOW precision of quarterly forecasts made to show the cross-sectional test. If forecast precisions are high (low), they are in HIGH (LOW) precision groups. Indicator variable TREATMENT takes the value of 1 if firms share directors with the target firms and 0 otherwise. POST is 1 for observations after the event year. Dependent variable CAR6MONTH is cumulative abnormal return for 6 months (126 days) of purchase transactions. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively

Table 10: Cross sectional tests- Voluntary disclosure

Panel C: **Accuracy** ‑ Proxy contest effect on interlocked firms, accuracy of disclosure and insider trading profitability

Independent Variables	Dependent Variable: CAR6MONTH	
	(HIGH)	(LOW)
TREATMENT_POST	-0.146***	0.016
	(-2.760)	(0.617)
POST	0.129***	-0.027
	(3.112)	(-1.509)
TREATMENT	0.086***	0.004
	(2.904)	(0.284)
SIZE	-0.044***	-0.021**
	(-2.631)	(-2.139)
MTB	-0.005	-0.008**
	(-0.597)	(-2.434)
ANALYST	-0.001	0.004***
	(-0.220)	(2.818)
AGE	0.024	0.018*
	(1.404)	(1.744)
SALES_GROWTH	0.241***	-0.012
	(3.575)	(-0.219)
RESEARCH	0.724*	1.125***
	(1.908)	(5.754)
LOSS	-0.153***	-0.131*
	(-3.897)	(-1.700)
VOLATILITY	-0.102	-1.027***
	(-0.399)	(-4.630)
TURNOVER	-0.020	0.000
	(-0.893)	(0.022)
PASTRETURN	0.202***	0.106**
	(3.062)	(2.107)
BOARDSIZE	0.008	0.002
	(1.102)	(0.652)
BUSYNESS	-0.156	-0.006
	(-1.387)	(-0.122)
INDEPENDENCE	0.059	-0.069
	(0.551)	(-1.457)
OWNERSHIP	0.187	0.094
	(1.486)	(1.298)
DUALITY	0.018	-0.001
	(0.461)	(-0.043)
Constant	0.127	0.310***
	(0.445)	(2.709)
Observations	1,545	1,619
R-squared	0.254	0.166
Year FE	Yes	Yes
Industry FE	Yes	Yes
Difference in coefficients on TREATMENT_POST between HIGH v LOW Precision of sub-sample: x^2 (p-value)	7.62***(0.006)	

Panel C of table (10) displays the relationship between proxy contest effects and insider trading profitability in the interlocked firms. Following Lin et al. (2020), we grouped firms into HIGH and LOW accuracy of quarterly forecasts made. If forecasts are higher (lower) than median, sample is HIGH (LOW). Indicator variable TREATMENT takes the value of 1 if firms share directors with the target firms and 0 otherwise. POST is 1 for observations after the event year. Dependent variable CAR6MONTH is cumulative abnormal return for 6 months (126 days) of purchase transactions. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Table 11: Cross sectional tests- Readability of annual (10-K) reports

Cross-sectional analysis- Proxy contest effect on interlocked firms, readability and insider trading profitability

Independent Variables	Dependent Variable: CAR6MONTH			
	FOG Index		BOG Index	
	(LOW)	(HIGH)	(LOW)	(HIGH)
TREATMENT_POST	-0.112***	-0.020	-0.084***	0.013
	(-4.736)	(-0.989)	(-4.695)	(0.388)
POST	0.042**	0.051***	0.041***	0.008
	(2.409)	(3.612)	(3.120)	(0.344)
TREATMENT	0.069***	0.035***	0.059***	0.002
	(5.590)	(3.240)	(6.171)	(0.105)
SIZE	-0.057***	-0.050***	-0.055***	-0.085***
	(-7.757)	(-7.584)	(-9.950)	(-7.837)
MTB	-0.008***	-0.010***	-0.011***	-0.012***
	(-2.824)	(-4.895)	(-5.686)	(-2.789)
ANALYST	0.007***	0.005***	0.006***	0.008***
	(4.934)	(5.167)	(6.530)	(4.353)
AGE	0.021***	-0.006	0.016***	-0.006
	(2.687)	(-0.895)	(2.742)	(-0.518)
SALES_GROWTH	-0.010	0.150***	0.125***	0.068***
	(-0.492)	(10.112)	(9.325)	(2.899)
RESEARCH	0.067	-0.048	0.127	0.048
	(0.419)	(-0.295)	(0.949)	(0.223)
LOSS	-0.031	-0.055***	-0.026	-0.166***
	(-1.221)	(-2.619)	(-1.379)	(-4.989)
VOLATILITY	0.138	-0.250*	-0.267**	0.340
	(0.985)	(-1.898)	(-2.441)	(1.610)
TURNOVER	-0.008	0.005	-0.003	-0.053***
	(-0.802)	(0.482)	(-0.353)	(-3.266)
PASTRETURN	0.188***	0.208***	0.268***	0.016
	(4.744)	(5.841)	(8.613)	(0.287)
BOARDSIZE	0.005*	-0.013***	-0.001	0.004
	(1.724)	(-4.814)	(-0.415)	(0.796)
BUSYNESS	0.092**	0.019	0.110***	-0.014
	(1.998)	(0.440)	(3.020)	(-0.178)
INDEPENDENCE	-0.057	0.080**	-0.043	0.179***
	(-1.193)	(2.224)	(-1.182)	(2.912)
OWNERSHIP	-0.046	0.282***	0.049	0.035
	(-0.681)	(6.004)	(1.063)	(0.382)
DUALITY	-0.013	-0.045***	-0.048***	-0.075**
	(-0.716)	(-2.985)	(-3.635)	(-2.414)
Constant	0.143	0.490***	0.222***	0.788***
	(1.628)	(4.516)	(3.264)	(5.382)
Observations	3,894	4,078	6,105	1,692
R-squared	0.136	0.198	0.136	0.185
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Difference in coefficients on TREATMENT_POST between HIGH v LOW Precision of sub-sample: x^2 (p-value)	22.43***(0.000)		22.04***(0.000)	

The table (11) displays the relationship between proxy contest effects and insider trading profitability varying cross-sectionally among firms with different levels of disclosure readability. We grouped sample into LOW and HIGH based on readability. If Fog Index/Bog index is higher (lower) than sample median, sample has low (high) readability. Indicator variable TREATMENT takes the value of 1 if firms share directors with the target firms and 0 otherwise. POST is 1 for observations after the event year. Dependent variable CAR6MONTH is cumulative abnormal return for 6 months (126 days) of purchase transactions. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively

Table 12: Cross sectional tests- Analyst forecast errors

Cross-sectional analysis- Proxy contest effect on interlocked firms, analyst forecast error and insider trading profitability

Independent Variables	Dependent Variable: CAR6MONTH	
	(LOW)	(HIGH)
TREATMENT_POST	-0.120***	-0.025
	(-5.140)	(-1.182)
POST	0.030*	0.052***
	(1.865)	(3.485)
TREATMENT	0.096***	-0.011
	(7.917)	(-0.973)
SIZE	-0.052***	-0.051***
	(-7.331)	(-7.934)
MTB	-0.011***	-0.013***
	(-4.304)	(-5.570)
ANALYST	0.005***	0.007***
	(4.109)	(5.928)
AGE	0.001	0.015**
	(0.188)	(2.192)
SALES_GROWTH	0.110***	0.107***
	(4.900)	(7.995)
RESEARCH	0.421**	-0.223
	(2.543)	(-1.495)
LOSS	0.025	-0.124***
	(0.990)	(-5.733)
VOLATILITY	0.177	-0.108
	(1.220)	(-0.857)
TURNOVER	-0.001	-0.028***
	(-0.080)	(-2.919)
PASTRETURN	0.129***	0.313***
	(3.467)	(8.112)
BOARDSIZE	0.009***	-0.007**
	(3.110)	(-2.556)
BUSYNESS	-0.030	0.092**
	(-0.643)	(2.127)
INDEPENDENCE	-0.137***	0.138***
	(-3.061)	(3.614)
OWNERSHIP	-0.050	0.129**
	(-0.851)	(2.537)
DUALITY	-0.023	-0.035**
	(-1.388)	(-2.068)
Constant	0.212**	0.066
	(2.106)	(0.795)
Observations	3,832	4,153
R-squared	0.180	0.148
Year FE	Yes	Yes
Industry FE	Yes	Yes
Difference in coefficients on TREATMENT_POST between HIGH v LOW Precision of sub-sample: x^2 (p-value)	26.42***(0.000)	

The table (12) displays the relationship between proxy contest effects and insider trading profitability varying cross-sectionally across firms in terms of analyst forecast errors. If forecast errors are higher (lower) than median, the sample has HIGH (LOW) forecast errors. Indicator variable TREATMENT takes the value of 1 if firms share directors with the target firms and 0 otherwise. POST is 1 for observations after the event year. Dependent variable CAR6MONTH is cumulative abnormal return for 6 months (126 days) of purchase transactions. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Table 13: common ownership

Cross-sectional analysis- Proxy contest effect on interlocked firms, common ownership and insider trading profitability

Independent Variables	Dependent Variable: CAR6MONTH					
	DENSITY		PCS		C	
	(HIGH)	(LOW)	(HIGH)	(LOW)	(HIGH)	(LOW)
TREATMENT_POST	-0.171***	-0.044	-0.092***	-0.007	-0.178***	-0.006
	(-4.347)	(-1.495)	(-2.655)	(-0.216)	(-5.180)	(-0.183)
POST	0.101***	-0.017	0.060**	-0.054**	0.123***	-0.049**
	(4.174)	(-0.826)	(2.484)	(-2.188)	(5.567)	(-2.229)
TREATMENT	0.088***	0.049***	0.068***	0.047***	0.081***	0.079***
	(4.156)	(3.213)	(3.936)	(2.712)	(4.368)	(4.808)
SIZE	-0.079***	-0.072***	-0.053***	-0.063***	-0.073***	-0.060***
	(-5.659)	(-7.630)	(-4.446)	(-5.892)	(-6.117)	(-5.992)
MTB	0.001	-0.011***	-0.005	-0.021***	-0.007	-0.010***
	0.086	(-3.910)	(-1.562)	(-4.974)	(-1.386)	(-3.356)
ANALYST	0.094***	0.121***	0.097***	0.149***	0.135***	0.106***
	(3.486)	(6.232)	(3.921)	(6.898)	(5.625)	(5.31)
AGE	0.044**	0.004	0.034***	-0.003	0.035***	-0.015
	(2.573)	(0.395)	(2.85)	(-0.279)	(2.667)	(-1.447)
SALES_GROWTH	0.350***	0.064***	0.064***	0.028*	0.229***	-0.047**
	5.556	4.404	(3.703)	(1.668)	(10.006)	(-2.418)
RESEARCH	0.829***	-0.108	0.001	-0.019	0.035	0.053
	2.806	(-0.597)	(0.002)	(-0.105)	(0.096)	(0.314)
LOSS	-0.043	-0.112***	-0.041	-0.138***	-0.01	-0.118***
	(-1.060)	(-3.806)	(-0.979)	(4.520)	(-0.260)	(-4.028)
VOLATILITY	-0.349	-0.508***	0.369*	-0.477***	-0.157	-0.931***
	(-1.457)	(-3.435)	(1.782)	(-2.916)	(-0.822)	(-5.409)
TURNOVER	-0.013	-0.035***	-0.017	-0.052***	-0.018	-0.007
	(-0.706)	(-2.699)	(-1.035)	(-3.724)	(-1.101)	(-0.538)
PASTRETURN	0.082	0.270***	0.322***	0.239***	0.093*	0.361***
	(1.37)	(6.149)	(5.802)	(4.981)	(1.708)	(8.00)
BOARDSIZE	0.004	-0.007*	0.002	-0.009**	0.010**	-0.010***
	0.701	(-1.748)	(0.456)	(-2.239)	(2.371)	(-2.587)
BUSYNESS	-0.01	0.175***	-0.011	0.176***	0.017	0.220***
	(-0.122)	(3.19)	(-0.164)	(2.847)	(0.258)	(3.664)
INDEPENDENCE	0.190**	-0.078	-0.162**	-0.069	0.028	-0.073
	(2.044)	(-1.481)	(-2.549)	(-1.196)	(0.381)	(-1.290)
OWNERSHIP	0.376***	0.216***	-0.069	0.332***	0.202**	0.267***
	(3.947)	(3.081)	(-1.022)	(4.223)	(2.553)	(3.433)
DUALITY	-0.032	-0.01	0.009	-0.02	-0.033	-0.011
	(-0.979)	(-0.523)	(0.383)	(-0.937)	(1.290)	(-0.551)
Constant	-0.19	0.458***	0.081	0.392**	-0.271*	-0.271*
	(-1.145)	(3.035)	(0.568)	(2.194)	(-1.755)	(-1.755)
Observations	1,700	3,023	2,336	2,374	2,210	0.714***
Adjusted R-squared	0.201	0.166	0.184	0.166	0.206	-3.569
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Difference in coefficients on TREATMENT_POST between HIGH v LOW Common ownership of sub-sample: x^2 (p-value)		18.9***(0.00)		21.42***(0.00)		26.83***(0.00)

The table (13) displays the relationship between proxy contest effects and insider trading profitability varying cross-sectionally across firms in terms of common ownership. If common ownership presence is higher (lower) than median, the sample has HIGH (LOW) common ownership. Indicator variable TREATMENT takes the value of 1 if firms share directors with the target firms and 0 otherwise. POST is 1 for observations after the event year. Dependent variable CAR6MONTH is cumulative abnormal return for 6 months (126 days) of purchase transactions. We used a wide range of variables that includes SIZE, MTB, ANALYST, AGE, SALES_GROWTH, RESEARCH, LOSS, VOLATILITY, TURNOVER, PASTRETURN, BOARDSIZE, BUSYNESS, INDEPENDENCE, OWNERSHIP and DUALITY. Definitions for all those variables are provided in Appendix A.1. Standard errors are clustered at the firm level and corrected for heteroscedasticity. The t-values are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively