HEDGE FUND ACTIVISM AND LONG-TERM FIRM VALUE

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ABSTRACT

This paper investigates the association of hedge fund activism and long-term firm value. We show that the positive long-term association documented in prior studies is likely affected by selection bias, as activist hedge funds tend to target poorly performing firms. Second, once we incorporate such selection bias using a matched sample approach, we find that firms targeted by activist hedge funds improve less in value after activist hedge fund campaigns than ex-ante similarly poorly performing control firms that are not subject to hedge fund activism. This suggests that hedge fund activism decreases, rather than increases, a firm's long-term value, relative to non-targeted control firms that have similar characteristics as the targeted firms.

To explain our results, we explore whether the ability of activist hedge funds to substantially influence a firm's investment policy may exacerbate a firm's limited commitment problem toward long-term value creation and stable stakeholder relationships. Consistent with this hypothesis, we find that the reduction in value after hedge fund campaigns is more pronounced for firms where the limited commitment problem is more severe, namely firms that are more engaged in innovation and where stakeholder relationships are more important for long-term value creation.

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1. Introduction

Hedge fund activism has turned into a permanent force of corporate governance. Activist campaigns targeting publicly traded firms have steadily increased in the past ten years, and especially so in recent times (Coffee and Palia, 2015). The governance changes sought by activists have ranged from modest proposals, such as separating the positions of CEO and Board Chairman, to more radical interventions, such as firing the CEO or selling major assets or the firm to an acquirer. Largely due to this increased activism, the U.S. corporate landscape has now changed, with the result that Berle and Means' canonical account of corporate governance is no longer accurate (Gilson and Gordon, 2013). Under that account, shareholders in large public firms are portrayed as widely dispersed and, consequently, as facing collective action problems that limit their available remedies against managerial underperformance to the "Wall Street Rule" (i.e., the "exit" option to sell shares). In today's corporate environment, however, increased institutional shareholder concentration and hedge fund activism have empowered shareholders with the ability to exercise influential "voice" over the corporate affairs.

Distinguishing corporate features, and the incentives arising thereof, explain why hedge funds—unlike more traditional institutional investors such as mutual funds and pension funds—actively rely on voice, and more generally activist campaigns, in pursuing their investment targets (Kahan and Rock, 2007; Brav et al., 2008a; Brav et al., 2008b). First, and most importantly, hedge funds largely operate outside of the security regulation and registration requirements that constrain the operations of other institutional investors, as hedge funds typically cater to a small number of sophisticated investors rather than the retail-investment market. This allows hedge funds to concentrate their investments in few targeted companies, in which they typically hold large equity stakes. Regulatory freedom also grants hedge funds greater recourse to leverage, enabling them to pursue investments that are much larger than those of mutual funds with comparable net assets. Second, hedge funds are managed by professionals who make significant personal investments in the fund, in addition to receiving highly powered incentives. Third, hedge funds are independent investors—who do not sell services to the companies they

target—which makes them un-conflicted in the exercise of active governance rights. Finally, they contractually lock-up investor money for longer periods of time, which makes them less sensitive to liquidity shocks and hence better positioned to engage in active governance over potentially longer periods of time.

Yet, while everyone in the current corporate governance debate seems to agree that hedge funds activism has brought about sweeping corporate governance changes, sharp disagreement exists as to the effect of such changes on the financial performance of the targeted companies. So-called shareholder advocates see hedge funds as the natural champions of the long-dormant shareholder franchise. Under this view, hedge fund activism is described as a market-driven correction that has finally turned shareholder governance rights into an effective means of value enhancement (Brav. et al., 2008; Bebchuk, 2014; Bebchuk et al., 2015), with activist campaigns also promoting interventions by other, traditionally more passive institutional investors (Gilson and Gordon, 2013).

Economically, the shareholder advocate view of hedge fund activism rests on two main assumptions. The first is that managerial moral hazard is the main—if not the only—source of market imperfection, which implies that low corporate valuations generally reflect managerial underperformance (Bebchuk, 2005; Bebchuk, 2014). The second assumption is that boards of directors are often entrenched, which hinders their ability to serve as faithful guardians of shareholder interests (Bebchuk et al., 2002; Bebchuk and Fried, 2004). Under these assumptions, hedge fund activism ensures that market discipline is effective, enhancing shareholder monitoring, facilitating the active participation in corporate governance of other investors, and promoting greater board accountability (Bebchuk, 2007).

Other scholars and commentators hold an opposite view of shareholder activism, arguing that activist hedge funds tend to be impatient investors, who are primarily motivated by short-term interests (Lipton, 2013; Strine, 2010; Jacobs, 2011). Rather than promoting value-increasing governance changes, this view posits that hedge funds have incentives to seek interventions that boost a target's short-term

stock price at the potential expense of long-term performance—such as excessively increasing leverage, increasing cash payouts to shareholders, reducing investments in R&D and other long-term projects, reducing the work force, and cutting operating costs.

Another related strand of literature offers a different explanation for the potential detrimental effects of hedge fund activism. This literature starts from the theoretical proposition that the separation of ownership and control of publicly traded corporations, combined with asymmetric information and incomplete contracting issues, gives rise to an additional agency problem—namely the shareholders' limited commitment problem (Cremers, Litov and Sepe, 2015). This problem arises out of the inability of public shareholders vested with strong exit rights and exposed to informational inefficiencies to credibly commit to long-term investment strategies or engage in long-term cooperation with other firm stakeholders. Indeed, informational inefficiencies may render shareholders unable to tell whether poor short-term firm outcomes are due to managerial moral hazard or to increased corporate investments in projects whose value will only materialize in the long-term (Edmans, 2011; Popadak, 2015). Consequently, shareholders may rationally seek to protect their interests by advocating for different corporate policies, seeking management removal in a proxy contest or by selling their shares in a (hostile) takeover, all of which could lead to drastic corporate changes even in the short-term.

The ability of shareholders, especially activist hedge funds, to determine changes in corporate policies or firm control in the short-term complicates both managerial-decision making and the extent to which other stakeholders want to invest in their relationship with the firm. In anticipation of such changes, managers may develop myopic incentives (Stein, 1988, 1989; Karpoff and Rice, 1989; Bradenburger and Polak, 1996) and important stakeholders might be discouraged to invest optimally in the firm (Shleifer and Summers, 1988; Johnson et al., 2015). In both cases, the result is a reduction in long-term firm value. By enhancing shareholders' ability to pressure directors and managers, hedge fund activism could thus exacerbate the shareholders' limited commitment problem rather than acting as a beneficial corrective to managerial moral hazard.

In this paper, we explore the above debate, investigating the association of hedge fund activism and longer-term firm value. We start by revisiting the results of prior empirical studies suggesting that hedge fund activism is beneficial to shareholder interests in *both* the short-term *and* the long-term. We document two main results. First, we show that the positive long-term impact of hedge fund activism on firm value documented in prior studies is likely endogenous, as activist hedge funds tend to target firms that have been relatively poorly performing prior to the activists' interventions. Second, we document that market mechanisms other than activist hedge funds seem on average more successful than the typical activist hedge fund campaign in turning these relatively poorly performing firms around. Indeed, firms targeted by activist hedge funds improve less in value subsequent to the start of an activist hedge fund campaign than ex-ante similarly poorly performing control firms that are not subject to hedge fund activism. In other words, our matched-sample approach results suggest that hedge fund activism (and especially the activism of hedge funds using hostile tactics) is associated with reduced, rather than increased, firm value in the long-term, relative to non-targeted control firms with similar characteristics as the targeted firms.

Several event studies have examined the short-term effect of hedge fund interventions (see Brav et al., 2009 for a review), finding that firms targeted by activist hedge funds earn, on average, positive abnormal returns at the announcement of an activist campaign, although the observed economic magnitude of the abnormal returns varies. These studies, however, do not address the possibility that short-term abnormal returns following activist interventions come at the expenses of subsequent declines in firm performance. Brav et al. (2008) address this criticism by examining firm valuations for up to a year following the start of the activist campaign, finding results consistent with an overall positive effect of activism. However, a year might constitute too short a period to provide conclusive evidence on long-term effects. In a more recent study, which has had large echo in the media, Bebchuk et al. (2015) investigate firm valuations for up to five years after the start of hedge fund activism. These authors document that performance generally continues to increase in the five year period after the start of the

activist campaign (especially when the activist hedge fund campaign is "adversarial", i.e., employs hostile tactics), which the study interprets as evidence against what they call the "myopic-activist" claim.

We first revisit the results in Bebchuk et al. (2015), using the database of activist hedge fund campaigns from the (updated) Brav et al. (2008) dataset, which Bebchuk et al. (2015) also employs. This dataset covers the period 1995-2011 and identifies hedge fund interventions through Schedule 13D filings, which the 1934 Security Exchange Act requires investors acquiring more than 5% percent of any class of security of public companies to file with the Security and Exchange Commission (SEC) within 10 days of doing so. We are able to closely replicate the results of Bebchuk et al. (2015). In particular, in the five years after the start of the activist hedge fund campaign, the *Q* of targeted firms progressively increases, and more strongly so when the hedge fund campaign is classified as hostile in the Brav et al. (2008).

These results, however, need to be interpreted with caution, because the decision to target a particular firm at a particular time is an entirely discretionary choice by the activist hedge fund. Hence, firms being targeted by hedge funds could potentially be substantially different from other firms, and this heterogeneity may be related to their subsequent performance rather than to the activist hedge fund campaign directly. In order to better understand whether activist hedge funds tend to target a particular type of firms, we predict the determinants of activism through logit and Cox proportional hazard models. These models suggest that prior firm performance is the key predictor of becoming a target in an activist hedge fund campaign. Specifically, we find that firms are much more likely to become the target of hedge fund activism if they been performing relatively poorly in the past one to five years—that is, hedge funds seem to primarily target relatively undervalued firms.

This result, in turn, raises the possibility that the increase in firm value documented by prior studies might be attributable to market mechanisms other than the intervention by activist hedge funds. Indeed, in competitive markets, many different actors can intervene to turn things around at a relatively

poorly performing company, including key employees, top executive management, directors, long-term shareholders, as well as other stakeholders like large customers or suppliers. In order to address the possibility that other factors may explain the increase in firm value following hedge fund activism, we create a matched sample, where for each "target" firm that is targeted by an activist hedge fund we assign a "control" firm that has similar characteristics (using those characteristics that we document matter for being targeted) as the target firm in the year before the start of the target firm's activist hedge fund campaign.

Using this matched sample, we find that the long-term change in *Q* of the targeted firms in the years after the start of an activist hedge fund campaign is on average negative and statistically significant relative to the change in *Q* of the control firms, as the value of firms in our control group increases more than the value of firms in the target group. Specifically, starting with the target and controls firms having a similar value in the year before the start of the activist campaign, the firm value of the target firms tends to be 5.5% lower than the firm value of control firms at the end of the fiscal year in which the activist hedge funds start their campaign, and about 9.8% lower three years thereafter. We also document that hedge fund campaigns have a more negative association with long-term firm value when the campaign is adversarial. This striking result is robust to adding different fixed effects (including year, industry, firm, and higher dimensional effects such as year times industry fixed effects), and to several matching procedures, including nearest neighbor matching and propensity score matching. These results are also robust to incorporating the acquisition premium after firms are taken over (or more generally to incorporating the delisting price).

Next, we verify whether the negative association of hedge fund activism with long-term firm valuations might be explained by the threat that hedge funds might substantially influence a firm's investment policy and other operational decisions, therefore exacerbating the limited commitment problem. Under this hypothesis, we should find that the negative association between activism and long-term value is more pronounced in firms where the limited commitment problem is more important. This is

the case for firms more engaged in innovation, whose investments naturally tend to have a longer-term horizon. Using different proxies for more innovative firms (e.g., high R&D expenses, high intangible assets, and high patent citations), we document that when the target of hedge fund activism is an innovative firm, the decline in *Q* in the three years following the activist intervention tends to be much more severe, at economically and statistically significant levels. In particular, economically, the coefficients suggest that the group of innovative firms targeted in hostile hedge fund campaigns have declined in value by 50.05% in the three years after first being targeted, relative to the group of innovative control firms that were not targeted. Conversely, non-innovative firms targeted in hostile hedge fund campaigns declined in value by 7.49% relative to their control firms.

The limited commitment problem is also likely to be more relevant for firms with stronger specific relationships with other stakeholders such as employees, suppliers, and unsecure creditors. Consistent with this hypothesis, we find that when these long-term stakeholder relationships matter more to a hedge fund's target, the targeted firms experience on average a more severe decline in *Q* in the three years after the intervention, relative to the firm value of the matched control firms. Also in this case, our results are economically large and statistically significant. For example, the group of firms in the industry with the most productive labor force that are targeted in hostile hedge fund campaigns have declined in value by 29.71% relative to the control firms in the three years after first being targeted, while the other firms targeted in hostile hedge fund campaigns declined in value by 7.75% relative to their control firms.

Our findings have significant implications for the current corporate governance debate, as they challenge the desirability of an indiscriminate expansion of shareholder rights. While we recognize that managerial moral hazard or having entrenched managers and directors are concrete risks in corporate governance, our research suggests that facilitating the interventions of activist hedge funds might be an undesirable solution to address these risks. Indeed, once one takes into account the full range of informational problems faced by shareholders—including *both* managerial moral hazard (or entrenchment) *and* the shareholder limited commitment problem—hedge fund activism may carry costs

that seem to outweigh its potential benefits. This also suggests that a desirable direction for future empirical research would be to investigate whether alternative corporate governance solutions exists that may better address the trade-offs posed by the multiple informational problems that imbue the shareholder-manager relationship.

The rest of the paper is organized as follows. Section 2 describes our data sets and provides a definition of our main variables. Section 3 presents our main findings on the relation between hedge fund activism and long-term firm value. The results on the effects of hedge fund activism on firm value for firms facing limited commitment problems are discussed in Section 4. Section 5 concludes.

2. Data and Variable Definitions

To assess the association of hedge fund activism with long-term firm value, we combine data from several data sources. The hedge fund data is from Brav et al. (2008), and covers the period 1995 – 2011. The procedure to obtain the hedge fund data is explained in Brav et al. (2008), who use Schedule 13D filings as their main source. The 1934 Security Exchange Act requires that investors file a 13D form with the Security and Exchange Commission within 10 days of acquiring 5% of any class of securities of a publicly listed firm if the reason for such acquisition is to influence the management of the target firms. The authors use information on the filer type available in Item 2 of Schedule 13D to limit the sample to only hedge funds, filtering out other filers such as banks, brokerage companies, corporations, insurance companies, individuals, pension funds, and trusts. Brav et al. further rely on web-searches, newswires, and direct phone calls to help identify the filing entity as an activist hedge fund. The authors also exclude filers who only filed one 13D Schedule during the entire sample period, those that reported that the purpose of the acquisition is to get involved in bankruptcy reorganization or to assume an arbitrage position in M&A activities, and filers who do not explicitly report the reason of their acquisitions. These

screenings generate a sample of 480 hedge funds and 2,684 events.[1] Using newswires and other sources, Brav et al. categorize 604 events (by 210 hedge funds) out of the 2,684 events as hostile hedge fund interventions, i.e., where the intervention "includes a threatened or actual proxy contest, takeover, lawsuit, or public campaign that is openly confrontational."

In order to identify firms where stakeholders are particularly important or where the limited commitment problem is particularly relevant, we use three different proxies: patent citation counts, *Contract Specificity*, and labor productivity. We obtain data on patent citation counts at the firm level from the NBER U.S. Patent Citations data file. Data on the fraction of inputs in an industry that are not sold in an organized exchange or reference priced in a trade publication are from Nunn (2007) data file. This data is available only for 1997 and is used to construct our *Contract Specificity* measure. Our proxy for labor productivity, namely the output per hour of labor in the firm's industry, comes from the Bureau of Labor, U.S. Department of Labor.

We combine the hedge funds data and the other data sources with firm-level accounting data from COMPUSTAT and return data and delisting information from the Center for Research in Security Prices (CRSP). We use the return data to assess the market reaction for target and control firms around the hedge fund targeting dates. We restrict our sample to non-financial firms (excluding firms with SIC codes 6000 – 6999).

Our dependent variable is TobinQ, which is defined as the firm's Tobin's Q minus the 4 digit SIC-year median Tobin's Q, where Tobin's Q is measured as the ratio of the market value of total assets (COMPUSTAT's items *at – ceq + prcc_f×csho*) to the book value of total assets (*at*).

Our set of basic control variables includes the following measures. LnSize is the natural logarithm of the book value of total assets (COMPUSTAT's item *at*). Leverage is defined as the ratio of total debt (COMPUSTAT's items *dltt + dlc*) to the book value of total assets. CAPX is the ratio of capital expenditures (COMPUSTAT's item *capx*) to the book value of total assets. Intangibility is one minus the

[1] We refer the reader to Brav et al. (2008) for additional details on the construction of the hedge fund sample.

ratio of property, plant, & equipment (COMPUSTAT's item *ppent*) to the book value of total assets. ROA is the ratio of operating income before depreciation (COMPUSTAT's item *oibdp*) to the book value of total assets. Ln Market Value of Equity is the natural logarithm of market value of equity (COMPUSTAT's items *prcc_f* × *csho*). To avoid undue influence of outliers, we winsorize all continuous variables at the 1st and 99th percentiles of their full sample distributions.

Panel A of Table 1 provides a brief description of all of the variables used in our study, while Panel B of Table 1 reports the basic descriptive statistics. The average TobinQ in our sample is 2.939. The 25th and 75th percentiles are respectively -0.365 and 0.860, which suggests that there is significant heterogeneity in firm value in the sample.

To mitigate the concern that our main results could be biased by differences between hedge fund targets and non-target firms in the COMPUSTAT population, we perform our main regression analysis after carefully matching each target firm to its closest control firm from COMPUSTAT. As it will be discussed later in Table 4, this matching procedure generates samples of target and control firms that are very similar in terms of the Tobin's Q and other key firm characteristics in the year before the targeted firms received their first 13D filing from an activist hedge fund. The reported standard errors are robust and clustered by firm throughout the paper.

3. Hedge Funds and Firm Value

3.1. Replicating the Results in Bebchuk et al. (2015)

Our focus is on the association of hedge fund activism with long-term firm value. We start by replicating Table 4 in Bebchuck et al. (2015), regressing the firm's annual Tobin's Q at the end of the fiscal year on time dummies, the log of market value (COMPUSTAT's *prcc_f* × *csho*), the log of firm age (measured as the number of years since the firm first appeared in COMPUSTAT) at the end of the

fiscal year, and either industry (3-digit SIC) and year fixed effects, or firm and year fixed effects. The time dummies are defined as follows:

- "*t: Event year"* is an indicator equal to one for firms first targeted by an activist hedge fund sometime during the fiscal year, and zero for every other year before or after that year. The "t: Event year"-dummy is always equal to zero for firms not targeted by an activist hedge fund during our sample period;
- "*t+1*" is an indicator variable equal to 1 for firms first targeted by an activist hedge fund in the previous fiscal year, and zero otherwise;
- "*t+2"* to *"t+5"* dummies are defined similarly to the "t+1" indicator, capturing the fiscal years 2 to 5 years after the year the firm was initially targeted.
- "*(t to t+3)"* is an indicator variable equal to 1 for firms targeted by a hedge fund in that fiscal year or one of the previous 3 fiscal years, and zero otherwise.
- "*Post t+3"* dummy is equal to 1 for firms targeted by a hedge fund at least 4 (or more) fiscal years later, and zero otherwise.

Table 2 reports results from these estimations, which generally replicate the results in Bebchuk et al. (2015). Columns (1) – (4) show the results considering all activist hedge funds, while columns (5) – (8) only consider firms targeted in a hostile manner by an activist hedge fund. The results in column (1) shows that firms targeted by an activist hedge fund tend to have a substantially lower value than other firms in the industry at the end of the year in which they are first targeted (i.e., the event year), but that this value discount has disappeared five years after the event year. Indeed, column (2) shows that in the period starting at least three years after the event year, firm value tends to be significantly higher compared to other firms in the same industry (as shown by the coefficient of 0.191 (t-statistic of 4.01) of the "Post t+3" variable).

In columns (3) and (4), we add firm fixed effects rather than industry fixed effects, effectively comparing how firm value changes over time before versus after a firm is targeted by an activist hedge

fund. Similar to the results in Bebchuk et al. (2015), we find that firm value increases in the years after a firm is targeted by an activist hedge fund. Economically, being targeted by an activist hedge fund is associated with an increase in firm value by about 9% three years afterwards (i.e., the coefficient of 0.265 of "Post t+3" in column 4, divided by the sample mean of 2.939). Finally, columns (5) – (8) indicate that the increase in firm value is more pronounced for firms targeted in a hostile campaign of an activist hedge fund.

3.2. The Ex-Ante Probability of Becoming a Hedge Fund Target

The results in Table 2 show that firm value tends to improve in the years after a firm is targeted by an activist hedge fund. However, this result needs to be interpreted with great caution, as the decision to target a particular firm at a particular time is an entirely discretionary choice by the activist hedge fund. Hence, firms being targeted by hedge funds could potentially be substantially different from other firms. Because of this possibility, it seems important to understand what type of firms tend to be targeted by activist hedge funds, and then to compare the performance of the firms being targeted (the "target" firms) to other firms that have similar characteristics but have not (yet) been targeted by an activist hedge fund (the "control" firms).

We consider what firm characteristics are associated with becoming a target in the next fiscal year by estimating a logit model (see Panel A of Table 3) and a Cox proportional hazard model (see Panel B of Table 3). These estimations allow us to assess which lagged variables help predict the probability that a firm will be targeted by a hedge fund in the next fiscal year, or how close a firm is to becoming a hedge fund target. In our discussion, we will focus on the logit model results shown in Panel A of Table 3, although we obtain similar results for the analogous Cox proportional hazard model (shown in Panel B of Table 3).

As shown in Panel A of Table 3, firms that are targeted by activist hedge funds tend to have relatively low valuations before they are being targeted. They also tend to be larger in size and, depending on the specification, tend to be more likely to be involved in research and development or have more

intangible assets. Column (1) shows that the coefficient on the industry median-adjusted Tobin's Q at t-5 is negative and statistically significant at the 1% level, suggesting that firms with a high valuation in their industry are significantly less likely to become a target. We find similar effects for lagging the Tobin's Q variables by four to one years in columns (2) to (5). If we include all of the industry median-adjusted *Q* variables together in column (6), all of the coefficients on the lags of *Q* become smaller in absolute value, while several coefficients also become statistically insignificant. This suggests that although it is primarily the most recent lagged *Q* that matters for future hedge fund interventions, the longer history of lagged valuations is also helpful for predicting which firms are more likely to become a target. LnSize is statistically significant across all specifications, while the other control variables are statistically significant in certain specifications but not in others. For example, this is the case for ROA, which is positively significant in column (1), but insignificant in the other specifications in Panel A.

3.3. Matched Sample

In order to control for firm heterogeneity, we create a matched sample of 'target' firms that are targeted by an activist hedge funds and their "control" firms, which have similar characteristics as the target firms in the year before the first activist hedge funds files a 13D. In particular, we match target firms to control firms using the nearest-neighbor Abadie-Imbens (2006) matching estimator, where control firms are a subset of the non-target firms selected as the closest match based on firm characteristics. To guide our selection of the matching variables, we consider the variables in our logit or Cox model estimations that showed up as statistically significant in at least one of the specifications in Panels A and B of Table 3. We drop (add) the statistically significant (insignificant) variables from (to) the set of matching variables if including (excluding) them leads to statistical differences between target and control firms after the matching has taken place.

Our Final Matched Sample is based on the following matching variables include the industry median-adjusted Tobin's Q (lags 1 to 5), leverage (lag 1), ROA (lag 1), the log of market value (lag 1), and the fiscal year. Table 4 shows that target firms (with the results for all hedge fund targets in Panel A

and for hostile hedge fund targets only in Panel B) and control firms are similar both in terms of the matching variables and other important firm characteristics that were not included in the matching. For example, the industry median-adjusted Tobin's Q for target and control firms are never statistically different in the five to one years prior to the targeting year. Similarly, target and control firms are very similar in terms of their market value, leverage, ROA, log of market capitalization, CAPX, R&D, and Intangibility in the year prior to the targeting event. The similarity in these characteristics means that using the matched sample, differences between the two groups of firms in the years prior to the targeting event are unlikely to be the reason for any divergence in the value of the target and control firms in the years following a hedge fund targeting event.

For robustness, we also use three alternative matching procedures (which we do no tabulate here for brevity), obtaining three additional matching samples. For the Alternative Matched Sample 1, we use the nearest-neighbor Abadie-Imbens (2006) matching estimator based on the following alternative set of matching variables: Tobin's Q (lags 1 to 5), log market value (lag 1), and two-digit SIC code. In the Alternative Matched Sample 2, we use the matching procedure based on firm's propensity score, including as covariates the variables that we document matter for being targeted in our logit proportional hazard model (see section 3.2. above): industry median-adjusted Tobin's Q (lags 1 to 5), log Size (lag 1), R&D (lag 1), Intangibility (lag 1), and ROA (lag 1). In the Alternative Matched Sample 3, we use an alternative specification of the propensity score, including as covariates the variables that we document matter for being targeted in our Cox proportional hazard model (see section 3.2. above): industry median-adjusted Tobin's Q (from lag 1 to 5), log Size (lag 1), R&D (lag 1), and ROA (lag 1). The reason we decided to use the Final Matched Sample over these alternative matching samples is because the Final Matched Sample minimizes the economic and statistical differences between the covariates of the treated and control groups before the hedge fund intervention (as shown in Table 4) and, therefore, yields a set of control firms whose characteristics are statistically closer to those of the targeted firms.

We use our Final Matched Sample throughout our following analysis. In our main tests, we regress the industry median-adjusted Tobin's Q on time dummies, the interaction of these time dummies with the *HF_Target* indicator (which equals one for firms targeted by a hedge fund, and zero for their matched control pairs), control variables, and various combinations of industry (4-digit SIC), firm, and year fixed effects.

The time dummies are defined as follows:

- "*t*" is an indicator equal to one for the fiscal year in which a firm is targeted by a hedge fund, and zero for every other year before or after the targeting event year. This indicator is also equal to one for the matched control firm;
- "*t-5*" is an indicator equal to one (for both target and control firms) five years before a firm is targeted by a hedge fund, and zero for every year before t-5 or after t-5;
- "*t-4*" to "*t+5*" are defined similarly to "t-5";
- "*Post t+5*" is an indicator equal to one (for both target and control firms) in the years from t+6 onwards, and zero for every year before t+6.; and
- "*Post t+3*" is defined similarly to "Post t+5".
- "*HF_Target* × *t*" is an indicator equal to one for firms targeted by a hedge fund in the year of the targeting event, and zero for every year before or after the targeting event year. "*HF_Target* × *t*" is always equal to zero for the matched-control pairs (i.e., firms not targeted by a hedge fund);
- "*HF_Target* × *t+1*" is an indicator equal to one for firms targeted by a hedge fund one year after the event year t, and zero for every year before t+1 or after t+1. "*HF_Target* × *t+1*" is always equal to zero for the matched-control pairs (firms not targeted by a hedge fund).
- "*HF_Target* × *t+2*" to "HF_Target × t+5" dummies are defined similarly to the "HF_Target × t+1" indicator.

- *"(t-4 to t-1)"* is an indicator equal to one (for both target and control firms) for the period from four years to one year before a firm is targeted by a hedge fund, and zero for every year before t-4 or after t-1.

- *"(t to t+3)"* is defined similarly to *"(t-4 to t-1)"*.

- *"HF_Target × t-4 to t-1"* is an indicator equal to one for firms targeted by a hedge fund for the period from four years to one year before the targeting event, and zero for every year before t-4 or after t-1. *"HF_Target × t-4 to t-1"* is always equal to zero for the matched-control pairs (firms not targeted by a hedge fund); and finally

- *"HF_Target × t to t+3"* and *"HF_Target × Post t+3"* are defined similarly to *"HF_Target × t-4 to t-1"*.

3.4. The Long-term Association between Firm Value and Becoming a Hedge Fund Target in a Matched Sample

In Table 5, we use our matched sample to reconsider the evidence in Bebchuk et al. (2015) that firms targeted by activist hedge funds tend to increase in value. The interactions of our event-time dummies ("t-5" through "t+5") with "*HF_Target*" indicate whether the firm value of targeted firms is different from those of non-targeted firms, while the event-time dummies without the interaction consider whether there is a more general pattern in the firm value that is shared by both target and control firms.

The specification in column (1) of Table 5 includes 4-digit SIC industry fixed effects as well as year fixed effects, plus a set of firm characteristics as controls, while column (2) uses firm rather than industry fixed effects. The results indicate that once one incorporates firm heterogeneity, firms targeted by activist hedge funds seem to have very different characteristics than the population of publicly traded firms. This significantly changes the results from Table 2. In particular, the time dummies that are not interacted with "*HF_Target*" and thus capture changes in firm value that are common to target and control firms, exhibit the general pattern of increasing in value over time. For example, the coefficient on

"*t*" in column (2) equals -0.193 (with a t-statistic of 2.88) and the coefficient on "*t+3*" equals 0.025 (with a t-statistic of 0.29), suggesting that both target and control firms significantly increase in firm value in the three years after the target firm is first targeted by an activist hedge fund. Results in column (1) with industry fixed effects are similar.

In contrast, the coefficients on the interactions of the event-time dummies with "*HF_Target*", which capture how the firm value of target firms differs from the firm value of control firms, indicate that the target firms tend to decrease in firm value after being targeted, relative to the firm value of the control firms. Note that the control firm sample is constructed—as shown in Table 4—to have a very similar firm value to the target firm sample in the year before the target firms are targeted. This allows a straightforward interpretation of the "*HF_Target*" interactions. For example, the coefficient of "*HF_Target* × t" in column (2) equals -0.162 (with a t-statistic of 2.84), and the coefficient of "*HF_Target* × t+3" equals -0.288 (with a t-statistic of 3.57). Economically, this means that the firm value of the target firms tend to be 5.5% (=-0.162 divided by the average Q in the target firm sample of 2.939) lower than the firm value of control firms at the end of the fiscal year in which the activist hedge funds start their campaign, and about 9.8% (=-0.288/2.939) lower three years thereafter.

These results do not appear to be driven by the particular matching procedure we selected. Indeed, when we use the three alternative matched samples based on the different matching procedures described in section 3.3 above, we obtain the same qualitative result, namely that target firms tend to decrease in value after being targeted, relative to the control firms. Using the Alternative Matched Sample 1, the statistical and economic results we obtain are on average stronger than the results we obtain using the Final Matched Sample. Similarly, using the Alternative Matched Samples 2 and 3 (based on propensity score matching), the estimate coefficients always remain negative and statistically significant until the fourth year after the hedge fund intervention.

Our findings suggest that the main result in Brav et al. (2015)—that firm value tends to go up after activist hedge funds commence their campaign—cannot be ascribed to the activist hedge fund

campaign itself. The control firms, which are not targeted by an activist hedge fund, tend to increase in firm value around the same time, and controlling for that, the target firms that are targeted by activist hedge funds actually perform worse. These findings thus seem to suggest that sample selection drives the results in Bebchuk et al. (2015). Activist hedge funds tend to target firms that have been relatively poorly performing in the past one to five years, as we documented in Table 3. However, in generally competitive markets, many different actors can intervene to turn things around at a relatively poorly performing company, including management, directors, long-term shareholders, other stakeholders like large customers or suppliers, and also, naturally, activist hedge funds. The increases in firm value of the firms in our control sample suggest that mechanisms other than activist hedge funds have been on average *more* successful than the typical activist hedge fund campaign in turning these relatively poorly performing firms around.

Our results are also robust to verifying that the firm value of target and control firms is similar before the activist campaign. To this end, in columns (3) and (4) of Table 5, we first group together the four years leading up to the target event ("*t-4 to t-1*"), the four years following the target event ("*t to t+3*") as well as the period after that ("*Post t+3*"). The results in columns (3) and (4) are quite similar to the results in columns (1) and (2), respectively. Next, in columns (5) and (6), we add the interaction between "*HF_Target*" and "*t-4 to t-1*" in order to verify that target firms tend indeed to have a similar firm value to the control firms in the period leading up to the activist hedge fund campaign. This is a basic robustness check of our comparison between target and control firms in our matched sample as done in Table 4. We find that this interaction is statistically insignificant in both column (5) with industry fixed effects and in column (6) with firm fixed effects, indicating that our matching procedure has successfully matched target firms with similarly (typically poorly) performing control firms, while adding this interaction does not change any of the other results.

Panel A of Figure 1 plots the annual averages of the industry median-adjusted Tobin's Q for both the target and control firms in the five years before to five years after the target firm is targeted by an

activist hedge fund. The figure further confirms that target and control firms have very similar firm values before the target firm is targeted during fiscal year t, that the firm value of the target firms declines substantially from the end of the fiscal year t-1 to the end of fiscal year t (during which year the firm is targeted), and then tends to increase in the three years after that in a similar way as the control firms.

Table 6 shows results analogous to those in Table 5, but then only including target firms and their controls for target firms involved in hostile activist hedge fund campaigns. Results for this sample are quite similar, as we again find that firm value tends to be significantly lower for the target firms in the years following the (hostile) activist hedge fund campaign. The main exception is for the interaction between being targeted by in a hostile hedge fund campaign ("*HHF_Target*") and the period starting three years after the event ("*Post t+3*"). While this interaction is generally negative and statistically significant in Table 5, for the hostile hedge fund sample the results are much weaker, especially if we include industry fixed effects. For firm fixed effects, this interaction has a coefficient of -0.202 in column (4) with a t-statistic of 1.42 and a coefficient of -0.268 with a t-statistic of 1.68, both of which have p-values close to 10%.

Panel B of Figure 1 plots the annual averages of the industry median-adjusted Tobin's Q for both the target and control firms in the five years before to five years after the target firm is targeted by an activist hedge fund, but now only considering hostile campaigns. The figure shows that target and control firms have very similar firm values before the target firm is targeted during fiscal year t, that the firm value of the target firms remains relatively low during the year the firm is targeted and hardly changes thereafter, while the value of the control firms tend to increase in the three years after the targeting year.

In our following analysis, whose results we document in the Appendix, we further verify that the above findings remain robust to incorporating delisting events (most importantly many M&A transactions where target firms are taken over) as well as controlling for time-varying industry-wide effects, such as feedback effects on the control firms from activist hedge funds targeting firms in the same industry as the control firms.

3.4. Incorporating Delisting Prices

So far, we have exclusively used firm information at the end of the fiscal year, as is typical in the literature that uses annual Compustat information to analyze variation in Tobin's Q. However, using fiscal year-end information means not incorporating changes in firm value happening during years in which the firm delists from a stock exchange. This is especially relevant for firms targeted by activist hedge funds, which are fairly likely to delist in our sample. In particular, we find that these firms are frequently taken over. As a result, the generally large takeover premia received by target shareholders have not been incorporated in our analysis so far, which could potentially change our inference (see Greenwood and Schor, 2009). In this subsection, we incorporate the delisting price information into the Tobin's Q at the end of the fiscal year before the firm delists, and show that our main results are robust to doing so.

Appendix Table A.1 shows the number of firms delisting in our matched sample. In Panel A, we consider all hedge fund targets. Out of the 2,648 events (which constitute 2,009 unique firms), 397 target firms delist because they are taken over, 187 delist due to the firm violating a stock exchange requirement (e.g., the stock price fell below the exchange acceptable level, the firm has insufficient equity, or is delinquent in the payment of the listing fee), 13 firms delist but effectively retain securities that are traded is a different stock market that is not included in CRSP, and 1 firm delists due to liquidation. Compared to the 352 (227+125) firms in the control sample, target firms seem more likely to delist due to M&A and exchange requirement violations.

In Panel B, we consider the sample targeted in hostile hedge fund campaigns only, where the relative propensity of target firms to become a takeover target is even larger relative to the propensity of control firms. Specifically, 121 out of 313 target firms in this sample are taken over, as compared to only 64 out of 302 control firms. This is consistent with the evidence in Boyson, Gantchev and Shivdasani (2015) that activist campaigns make targeted firms more likely to be taken over.

In Appendix Tables A.2 and A.3, we adjust the Tobin's Q at the end of the firm's last fiscal year before delisting for the delisting price that is reported in CRSP. Appendix Table A.2. shows the results

using the delisted-price adjusted Tobin's Q for the sample of all activist hedge fund campaigns, analogous to the results in Table 5. Appendix Table A.3 shows the results using the delisted-price adjusted Tobin's Q for the sample of only hostile activist hedge fund campaigns, analogous to the results in Table 6. In both cases, we find that our main result, namely that the value of firms targeted by activist hedge funds tends to decrease afterwards relative to control firms, is robust to incorporating the delisting price. For example in column (4) of Table A.2 with firm fixed effects, we find that the coefficient on the interaction "*HF_Target* × *t to t+3*" equals -0.195 (with a t-statistic of 3.51) and the coefficient on the interaction "*HF_Target* × *Post t+3*" equals -0.217 (with a t-statistic of 2.45), which are quite close to the analogous coefficients in column (4) of Table 5.

3.5. Adding time-varying industry fixed effects

Another important robustness check is to control for time-varying industry effects. For example, we do not match target and control firms by industry. Also, it is possible that activist hedge fund campaigns targeting a firm in a particular industry may have an effect on other firms in that industry, especially if the activist hedge funds is perceived as likely to target other firms operating in the same industry as prior firms it has targeted, as documented by Gantchev, Gredil and Jotiskasthira (2015).

We verify the robustness of our main result by adding 3-digit SIC industry fixed effects that change every year to our pooled panel specifications. Given that the 1,932 firms in our matched sample of all hedge fund targets come from 346 different industries and our sample consists of 17 years, that means adding about 5,882 annual industry dummies. The results with time-varying industry fixed effects for the matched sample of all hedge fund campaigns are reported in Appendix Table A.4, and for the sample of hostile hedge fund campaigns only in Appendix Table A.5. In both cases, we find that our results remain robust to adding these industry fixed effects.

4. Activist Hedge Funds and the Limited Commitment Problem

In this section, we consider whether the association between becoming a target in an activist hedge fund campaign and long-term firm value is different for firms where the limited commitment

problem is more relevant. As argued by Cremers et al. (2015), the limited commitment problem arises out of the separation of shareholder ownership and managerial control in the context of asymmetric information and limited contracting or where stakeholder investments have a long-term, firm-specific nature. In these cases, the strong exit rights of shareholders, combined with asset pricing inefficiencies, may make shareholders unable to commit to the longer-term horizon. This is because upon observing a disappointing short-term firm outcome, shareholders will generally be unable to tell whether such an outcome is the result of managerial opportunism or an investment whose value will only materialize in the long term. As a result, fearing that managerial opportunism might be the source of such an outcome and in the attempt to protect their interests, shareholders may rationally ask the board to change top management and corporate policies, or decide to sell their shares in a takeover attempt or agree to change the board of directors in a proxy contest, all of which may lead to changes in the corporate strategy. Anticipating these circumstances, directors and managers may develop myopic incentives to appease shareholders (Stein, 1988, 1989; Karpoff and Rice, 1988, Bradenburger and Polak, 1996) and other stakeholders may become less willing (or demand higher compensation) to offer their cooperation for longer-term investments (Shleifer and Summers, 1988; Johnson et al., 2015). In both cases, the result is a reduction in long-term firm value.

Activist hedge funds are naturally more empowered than other shareholder to challenge the board of directors to change corporate policies or even corporate strategy, promoting the adoption of decisions to fire the existing management, increase leverage, reduce cash, or sell the firm to a prospective acquirer. All of such interventions—or even just their threat—may increase costs to incumbents, who risk losing their jobs, as well as to other stakeholders, especially those who are required to make longer-term, firm-specific investments in their relationships with the firm. This suggests that hedge fund activism may exacerbate a firms' limited commitment problem, with potentially detrimental effects on long-term firm value creation.

If our explanation about the possible transmission channel through which hedge fund activism is negatively associated to firm value is correct, we would expect to find that activist hedge fund campaigns—and *hostile* campaigns especially—are more negatively related to longer-term firm value for firms where the limited commitment problem is more relevant. In order to test this hypothesis, we will consider two different ways to identify such firms. We first focus on firms whose corporate strategy seems to intrinsically make the limited commitment problem more prominent, namely firms involved in longer-term research and development projects or firms with significant intangible assets that may be harder for outside shareholders to value. Second, we consider different proxies for firms where specific stakeholders have to make more firm-specific and long-term investments in their relationship with the firm.

4.1. Innovative Firms

To identify firms whose corporate strategies are likely to make the limited commitment problem particularly relevant, we employ three different proxies. First, we focus on firms that have high research and development expenses, as measured by a ratio of R&D expenses to sales that is above the 75th percentile in the sample (setting missing R&D expenses to zero). Second, we consider firms where intangible assets—such as goodwill, patents and trademarks—are relatively important, as measured by the ratio of book value of the firm's intangible assets over the book value of total assets being above the 75th percentile in the sample (setting missing intangible asset values to zero). Third and finally, we identify firms with significant patents directly using the NBER U.S. Patent Citations data file, focusing on firms with a patent citation count above the overall sample's 75th percentile.

In firm sharing the above characteristics it seems more likely that currently observable firm outcomes may not be fully informative about managerial performance (especially towards long-term value creation). This is because investments in R&D and intangible assets (including patents) naturally tend to be affected by a higher level of asymmetric information (Mizik and Jacobson, 2007, Edmans, 2011; Popadak, 2015). On the one hand, information about these investments is typically "soft" or non-

verifiable. Moreover, these long-term investments tend to require large capital expenditures up-front, which is a kind of hard information that current market prices can more easily incorporate. As a result, shareholders are more likely to rationally interpret poor observed short-term outcomes that tend to accompany these investments as evidence of poor managerial performance (Eberhart, Maxwell, and Siddique, 2004).

In Table 7, we add the interaction of the above three limited commitment proxies to the specification in column (4) of Table 6, namely the specification with firm fixed effects that groups together event-times "*t-4 to t-1*," "*t to t+3*," and "*Post t+3*" dummies for the matched sample of hostile hedge fund campaigns. Our main interest is in the triple interaction of each limited commitment proxy, the dummy variable "*HHF_Target*" indicating that the firm was targeted by a hostile activist hedge fund, and finally the event-time dummies. We also include the double interactions of the limited commitment proxies and the event-time dummies to control for any time-variation in the valuation of these characteristics that changes over time similarly for target and control firms.

Consistent with our hypothesis, Table 7 documents that firms in which the limited commitment problem seems more relevant decrease more in value after hostile activist hedge fund campaigns than other targeted firms. The results are striking in their significance. For example, the triple interaction of the "*High R&D*" dummy with "*HHF_Target*" and "*t to t+3*" equals -0.818 with a t-statistic of 2.15, while the double interaction of "*HHF_Target*" with "*t to t+3*" equals -0.144 with a t-statistic of 1.78. These results suggest that research-intensive firms tend to decrease in value substantially more than other targeted firms (both relative to their respective control firms), or more than five times as much. Economically, the coefficients indicate that the group of research intensive firms targeted in hostile activist hedge fund campaigns have declined in value by 50.05% (=-0.818-0.144, divided by the average *Q* of this sample of 1.922) in the three years after first being targeted, while the other firms declined in value by 7.49%% (=-0.144 divided by the average *Q* of this sample of 1.922). The results for firms with a high patent citation

count in column (3) are similar, and likewise the results in column (2) suggest that firms with significant intangible assets decline more in value than other targeted firms.

At the same time, we note that the triple interaction between the limited commitment proxies, "*HF_Target*" and "*t-4 to t-1*" are all statistically insignificant. This indicates that our matching procedure has matched control firms with a similar value to the group of firms where the limited commitment problem is more severe, i.e., to firms with more R&D, more intangible assets and more high patent citation counts.

4.2. Firms with Important Stakeholder Relationships

In order to identify firms where specific stakeholders have to make more specific and longer-term investments in their relationship with the firm, we consider three different proxies, respectively capturing the importance of suppliers, employees, and unsecured borrowers. Our first proxy, *High Contract Specificity*, captures firms in industries where suppliers have to make more firm-specific investments in their relationship with the firms in that industry, as measured by *Contract Specificity*, which is the fraction of inputs in the industry that is not sold in an organized exchange (or reference priced in a trade publication). This variable comes from Nunn (2007), who makes this data available on his website. *High Contract Specificity* equals one for firms in industries where *Contract Specificity* is above its 75th percentile in the sample.

The second proxy is also at the industry level, focusing on firms in industries where the labor productivity is above the 75th percentile in the sample. Labor productivity data comes from the Bureau of Labor Statistics at the U.S. Department of Labor. The third and final proxy is at the firm-level rather than the industry-level, and captures firms with high unsecured borrowing, i.e., firms where the ratio of the book value of unsecured debt (COMPUSTAT's items *dlc+dltt-dm*) to the book value of total debt (*dlc+dltt*) and the ratio of total debt to assets are both above their sample medians (which is the case for about 25% of the sample, capturing firms that have relatively high debt, a relatively large fraction of which consists of unsecured loans).

Similarly to the case of more innovative firms, for each of these three proxies, we find that firm value tends to decrease more after an hostile activist hedge fund campaign for firms where stakeholder participation seems especially relevant relative to firms where stakeholder participation is not as important. For example, the coefficient on the triple interaction of "*High Labor Productivity*" with "*HHF_Target*" and "*t to t+3*" equals -0.422 with a t-statistic of 2.16, while the double interaction of "*HHF_Target*" and "*t to t+3*" has a coefficient of -0.149 with a t-statistic of 1.41. This suggests that the decline in firm value for firms where employees are relatively more productive is substantially larger in the years following a hostile hedge fund campaign, potentially because such campaign may disrupt the firm's relationship with these productive employees. For example, the most valuable employees will likely have the best outside options and may choose to leave the firm rather than experiencing a continued threat of further disruption to their work environment arising from the hostile activist hedge fund campaign.

Economically, the coefficients suggest that the group of firms where employees are relatively more productive that are targeted in hostile activist hedge fund campaigns have declined in value by 29.71% (=-0.422-0.149, divided by the average Q of this sample of 1.922) in the three years after first being targeted, while the other firms declined in value by 7.75% (=-0.149 divided by the average Q of this sample of 1.922). The results for the other two proxies for firms with more important stakeholder relationships are similar.

5. Conclusion

This paper considers the role of hedge fund activism on firm value. Previous research has emphasized that hedge fund activism can increase firm value by more effectively monitoring corporate executives. As a matter of theory, however, hedge fund intervention may likewise exacerbate the limited commitment problem arising in publicly traded corporation, thereby undermining the ability of corporate

managers to pursue value-increasing long-term investments and complicating (or making more costly) the cooperation of other stakeholders towards such long-term value creation.

To verify these conflicting theoretical hypotheses about the long-term association between hedge fund activism and firm value, we carefully match firms targeted by hedge fund activists to non-targeted control firms. Consistent with the limited commitment hypothesis, our findings reveals that in the years following the intervention of activist hedge funds, the firm value of hedge fund targets deteriorates (sizably) compared to control firms. These results are robust to accounting for the potentially higher premium that hedge fund targets receive in follow-up mergers and to incorporating time-varying industry fixed effects. Most importantly, we find the decrease in firm value for target firms (compared to control firms) to be particularly sizable for firms that are more likely to be affected by the limited commitment problems, such as firms that rely more intensively on R&D investments, intangible assets, and patents, or firms in industries characterized by high contract specificity, high labor productivity, and intensive use of unsecured debt.

Our paper contributes to the current academic and policy debate on the association between hedge fund intervention and firm value. Incorporating firm heterogeneity in a matching approach—and especially that firms targeted by activist hedge funds tend to have performed poorly in the period before they were targeted—we document a large decrease in firm value for target firms compared to control firms with a similarly poor ex-ante performance. Importantly, our study identifies the channel—namely the aggravation of the limited commitment problem—to help explain why firm value tends to decrease in the years after an activist hedge fund has started its campaign. Future research could consider additional channels through which hedge fund interventions can affect firm value, as well as investigate whether alternative governance solutions might be better suited at solving the trade-off between addressing both managerial moral hazard and the limited commitment problems that arise in the public corporation.

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Table 1 – Variable Definitions – Panel A

Table 1 provides a definition of the main variables used in the paper.

Dependent Variable:	
TobinQ	TobinQ is the industry-median adjusted Tobin's Q, calculated as the firm's Tobin's Q minus the 4-digit SIC-year median Tobin's Q (where Tobin's Q is the ratio of market value of total assets (COMPUSTAT's items *at–ceq+prcc_f×csho*) to book value of assets (at)). Sample period 1995 – 2011.
Control Variables:	
LnSize	LnSize is the natural logarithm of the book value of total assets (COMPUSTAT's item *at*). Sample period 1995 – 2011.
Leverage	Leverage is the ratio of the book value of total debt (COMPUSTAT's items *dltt* + *dlc*) to the book value of assets. Sample period 1995 – 2011.
CAPX	CAPX is the ratio of capital expenditures (COMPUSTAT's item *capx*) to the book value of total assets. Sample period 1995 – 2011.
R&D	R&D is the ratio of R&D expenses (COMPUSTAT's item *xrd*) to the book value of total assets. Sample period 1995 – 2011.
Intangibility	Intangibility is one minus the ratio of property, plants, & equipments (COMPUSTAT's item *ppent*) to the book value of total assets. Sample period 1995 – 2011.
ROA	ROA is the ratio of operating income before depreciation (COMPUSTAT's item *oibdp*) to the book value of total assets. Sample period 1995 – 2011.
Ln Market Value of Equity	LnSize is the natural logarithm of market value of equity (COMPUSTAT's items *prcc_f* × *csho*). Sample period 1995 – 2011.
Hedge Funds and Limited Commitment Variables	**Used in Matched-Sample Analysis Only: Table 4 and onward**
HF_Target	HF_Target is an indicator equal to 1 for firms targeted by an activist hedge fund during our sample. The hedge fund data is from Brav et al. (2008) (and subsequently updated by those authors) and cover the period 1995 – 2011.

HHF_Target	HHF_Target is an indicator equal to 1 for firms targeted by an activist hedge fund in a hostile campaign as coded by Brav et al. (2008) (and subsequently updated by those authors), covering the period 1995 – 2011.
High R&D	High R&D is an indicator equal to 1 if the ratio of R&D expenses (COMPUSTAT's item *xrd*) to total sales (*sale*) for the firm is above the overall sample 75th percentile on the year before the targeting event. Sample period 1995 – 2011.
High Intangibility	High Intangibility is an indicator equal to 1 if Intangibility (COMPUSTAT's items: *1 – ppent/at*) for the firm is above the overall sample 75th percentile on the year before the targeting event. Sample period 1995 – 2011.
High Patent Citation	High Patent Citation is an indicator equal to 1 for firms with a number of patent citation counts above the overall sample 75th percentile on the year before the targeting event. The patent citation count data is from the NBER U.S. Patent Citations data file. Sample period 1995 – 2010.
High Contract Specificity	High Contract Specificity is an indicator equal to 1 if the firm operates in an industry in which the percentage of inputs that are not sold in an organized exchange (or reference priced in a trade publication in the Nunn (2007) data file) is above the overall sample mean on the year before the targeting event. Data is available only for 1997.
High Labor Productivity	High Labor Productivity is an indicator equal to 1 if labor productivity (output per hour of labor) in the firm's industry is above the overall sample 75th percentile on the year before the targeting event. The labor productivity data are from Bureau of Labor Statistics (U.S. Department of Labor). Sample period 1995 – 2011.
High Unsecured Borrowing	High Unsecured Borrowing is an indicator equal to 1 for firms for which the ratio of unsecured debt (COMPUSTAT's items *dlc+dltt-dm*) to total debt (*dlc+dltt*) and the ratio of total debt to assets are both above their sample medians on the year before the targeting event. Sample period 1995 – 2011.

Table 1 - Descriptive Statistics – Panel B

This table reports descriptive statistics for the main variables used in the paper. The sample includes all non-financial firms from COMPUSTAT for the period 1995 – 2011. See Table 1, Panel A for detailed variable definitions.

Variables	Mean	St. Dev.	25th PCTLE	75th PCTLE	Obs.
Dependent Variable:					
TobinQ	2.939	14.314	-0.365	0.860	91,466
Control Variables:					
LnSize	4.631	2.681	2.929	6.508	106,073
Leverage	0.369	0.741	0.021	0.414	105,689
CAPX	0.060	0.074	0.015	0.072	104,594
R&D	0.081	0.197	0.000	0.069	106,073
Intangibility	0.729	0.249	0.588	0.929	105,888
ROA	-0.235	1.284	-0.084	0.151	105,148
Ln Market Value of Equity	4.651	2.493	2.923	6.411	91,972

Table 2 – Evolution of Tobin's Q over Time as in Table 4 of Bebchuk et al. (2015)

This table presents the coefficient estimates from OLS regressions where the dependent variable is Tobin's Q. The hedge fund data is from the (updated) dataset used in Brav. et al. (2008) and covers the period 1995 to 2011. The sample includes all non-financial firms from COMPUSTAT for the period 1995 – 2011. We follow Bebchuk et al. (2015) in the definition of variables and model specification. In particular, "*t: Event year*" is an indicator equal to one for firms targeted by a hedge fund in the year of the targeting event, and zero for every other year before or after the targeting event year. The *t*-dummy is always equal to zero for firms not targeted by a hedge fund. The other time dummies are defined similarly (see text for further details). See Table 1 for the description of all the variables. In all regressions, we include dummy variables representing the year of intervention as well as each of subsequent five years. In the table, *t*-statistics in brackets are based on robust standard errors clustered by firm.

	All Hedge Funds				Hostile Hedge Funds			
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Dependent variable:	*Tobin's Q*	*Tobin's Q*	*Tobin's Q*	*Tobin's Q*	*Tobin's Q*	*Tobin's Q*	*Tobin's Q*	*Tobin's Q*
t: Event year	-0.361***		-0.155***		-0.617***		-0.323***	
	[-7.564]		[-3.063]		[-7.963]		[-4.029]	
t+1	-0.283***		-0.022		-0.425***		-0.073	
	[-5.887]		[-0.409]		[-4.828]		[-0.720]	
t+2	-0.254***		0.006		-0.348***		0.012	
	[-5.415]		[0.120]		[-3.996]		[0.114]	
t+3	-0.124**		0.128**		-0.228**		0.122	
	[-2.402]		[2.374]		[-2.184]		[1.053]	
(t to t+3)		-0.129**		0.052		-0.274***		-0.013
		[-2.475]		[0.973]		[-3.064]		[-0.141]
Post t+3		0.191***		0.265***		0.202***		0.411***
		[4.011]		[4.101]		[2.593]		[3.821]
t+4	-0.094*		0.164***		-0.129		0.225**	
	[-1.679]		[2.792]		[-1.174]		[2.018]	
t+5	-0.067		0.174***		-0.093		0.254**	
	[-1.053]		[2.800]		[-0.695]		[2.061]	
LnMV	0.228***	0.228***	0.733***	0.734***	0.228***	0.228***	0.733***	0.733***
	[38.133]	[38.185]	[63.870]	[63.877]	[38.138]	[38.143]	[63.862]	[63.866]
LnAge	-0.384***	-0.384***	-0.482***	-0.477***	-0.386***	-0.386***	-0.482***	-0.479***
	[-29.814]	[-29.823]	[-19.164]	[-18.938]	[-29.966]	[-29.949]	[-19.142]	[-19.007]
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIC3-Fixed Effect	Yes	Yes			Yes	Yes		
Firm-Fixed Effect			Yes	Yes			Yes	Yes
Pre-event dummies	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Obs.	131,163	131,163	131,163	131,163	131,163	131,163	131,163	131,163
R-2 (within)	0.077	0.077	0.170	0.170	0.077	0.077	0.170	0.170
F-Tests: [t+3] - t	17.03		25.11		11.09		13.55	
p - val	0.00%		0.00%		0.09%		0.02%	
[t+4] - t	16.58		23.01		21.80		26.13	
p - val	0.00%		0.00%		0.00%		0.00%	
[t+5] - t	16.44		20.44		12.92		16.46	
p - val	0.01%		0.00%		0.03%		0.00%	

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Table 3 – The Ex-ante Probability of Becoming a Hedge Fund Target

This table presents the marginal effects estimates from logit (Panel A) and Cox proportional hazard model (Panel B) regressions. The hedge fund data is from the (updated) dataset used in Brav. et al. (2008) and covers the period 1995 to 2011. The sample includes all non-financial firms from COMPUSTAT for the period 1995 – 2011. In Panel A, the dependent variable is an indicator equal to 1 if the firm is targeted by a hedge fund in a given year, and zero otherwise. In Panel B, we categorize as "failure" an event year in which a firm is targeted by a hedge fund. To construct our sample, we use all firms that have not been targeted by a hedge fund in the past five years. If a firm is targeted by a hedge fund, we drop it from our sample. We allow the firm to re-enter the sample if it has not been targeted by a hedge fund for at least five years. See Table 1 for detailed variable definitions. In the table, *t*-statistics appear in brackets and are based on robust standard errors clustered by firm.

Panel A: Logit	**Hedge Fund Target Dummy**					
	(1)	(2)	(3)	(4)	(5)	(6)
TobinQ at t=-5	-0.001***					-0.000
	[-3.437]					[-1.472]
TobinQ at t=-4		-0.002***				-0.001**
		[-5.922]				[-2.477]
TobinQ at t=-3			-0.002***			-0.000
			[-2.579]			[-0.341]
TobinQ at t=-2				-0.001**		-0.000
				[-2.437]		[-0.009]
TobinQ at t=-1					-0.002***	-0.002*
					[-3.664]	[-1.738]
LnSize at t=-1	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	[3.176]	[3.401]	[3.412]	[4.271]	[5.165]	[2.697]
Leverage at t=-1	-0.001	0.000	0.000	0.000	0.002	0.002
	[-0.858]	[0.256]	[0.277]	[0.127]	[1.441]	[1.027]
CAPX at t=-1	0.004	0.011	0.012	0.010	0.008	0.012
	[0.355]	[1.072]	[1.214]	[1.078]	[0.954]	[1.063]
R&D at t=-1	0.004	0.003	0.005	0.005	0.007**	0.004
	[1.106]	[0.757]	[1.609]	[1.558]	[2.082]	[1.043]
Intangibility at t=-1	0.004	0.005*	0.004	0.005*	0.005*	0.006**
	[1.536]	[1.690]	[1.399]	[1.767]	[1.944]	[2.002]
ROA at t=-1	0.003*	0.002	0.002	0.001	-0.001	-0.002
	[1.715]	[1.428]	[1.542]	[1.072]	[-0.654]	[-0.902]
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	61,527	66,387	71,698	77,461	83,789	59,904
Pseudo-R2	0.031	0.032	0.032	0.033	0.037	0.035

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Panel B: Cox model	**Failure Event: Hedge Fund Target Dummy**					
	(1)	(2)	(3)	(4)	(5)	(6)
TobinQ at t=-5	-0.123***					-0.064**
	[-3.598]					[-2.416]
TobinQ at t=-4		-0.165***				-0.064*
		[-3.957]				[-1.956]
TobinQ at t=-3			-0.117**			-0.005
			[-1.983]			[-0.157]
TobinQ at t=-2				-0.124*		0.004
				[-1.762]		[0.193]
TobinQ at t=-1					-0.267**	-0.155
					[-2.294]	[-1.363]
LnSize at t=-1	0.051**	0.059**	0.056**	0.058**	0.062**	0.052**
	[2.253]	[2.455]	[2.366]	[2.375]	[2.356]	[2.091]
Leverage at t=-1	-0.125	-0.043	-0.032	-0.016	0.166	0.077
	[-1.151]	[-0.378]	[-0.278]	[-0.128]	[0.941]	[0.457]
CAPX at t=-1	-0.435	-0.541	-0.344	-0.569	-0.584	0.152
	[-0.549]	[-0.702]	[-0.440]	[-0.733]	[-0.741]	[0.155]
R&D at t=-1	0.373	0.431	0.514*	0.578*	0.687*	0.422
	[1.262]	[1.402]	[1.679]	[1.777]	[1.808]	[1.088]
Intangibility at t=-1	0.073	0.093	0.115	0.162	0.184	0.210
	[0.304]	[0.382]	[0.469]	[0.628]	[0.687]	[0.715]
ROA at t=-1	0.258*	0.295*	0.354*	0.352*	0.228	-0.004
	[1.731]	[1.790]	[1.951]	[1.851]	[0.990]	[-0.025]
Obs.	38,764	41,063	42,725	43,617	44,427	38,065
Wald-chi2	69.52***	82.88***	51.47***	47.25***	36.47***	62.03***

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Table 4 – Hedge Funds Targets and Matched-Control Firms

This table reports mean difference tests of firm characteristics for firms targeted by hedge funds and control firms (Panel A) and for firms targeted by hostile hedge funds and control firms (Panel B). The hedge fund data is from the (updated) dataset used in Brav. et al. (2008) and covers the period 1995 to 2011. The sample includes non-financial firms from COMPUSTAT for the period 1995 – 2011. Control firms are a subsample of the non-targeted firms selected as the closest match based on Tobin's Q (lag 1 to 5), natural logarithm of market value of equity (lag 1), leverage (lag 1), ROA (lag 1), and fiscal year. We use the Abadie-Imbens matching estimator to identify the control firms (Abadie and Imbens, 2006). Refer to Table 1 for detailed variable definitions.

Panel A: All Hedge Funds	**Target**	**Control**	**Difference**	**Difference *t*-test *p*-value**
TobinQ at t-1	0.158	0.211	-0.053	0.736
TobinQ at t-2	0.302	0.230	0.072	0.640
TobinQ at t-3	0.298	0.249	0.049	0.728
TobinQ at t-4	0.291	0.429	-0.138	0.381
TobinQ at t-5	0.400	0.341	0.059	0.550
Log Market Value at t-1	5.094	5.103	-0.009	0.909
Leverage at t-1	0.253	0.249	0.004	0.761
ROA at t-1	0.017	0.019	-0.001	0.944
Log Size at t-1	5.439	5.396	0.043	0.595
CAPX at t-1	0.051	0.048	0.002	0.380
R&D at t-1	0.060	0.050	0.010	0.109
Intangibility at t-1	0.744	0.733	0.011	0.264
Panel B: Hostile Hedge Funds	**Treated**	**Control**	**Difference**	**Difference *t*-test *p*-value**
TobinQ at t-1	-0.209	-0.146	0.177	0.342
TobinQ at t-2	-0.082	0.014	-0.096	0.198
TobinQ at t-3	0.347	0.033	0.314	0.405
TobinQ at t-4	0.196	0.096	0.100	0.343
TobinQ at t-5	0.313	0.247	0.066	0.598
Log Market Value at t-1	5.311	5.310	0.002	0.991
Leverage at t-1	0.231	0.228	0.003	0.895
ROA at t-1	0.072	0.074	-0.002	0.863
Log Size at t-1	5.736	5.585	0.150	0.267
CAPX at t-1	0.053	0.051	0.002	0.643
R&D at t-1	0.050	0.038	0.012	0.113
Intangibility at t-1	0.743	0.729	0.014	0.465

Table 5 – Hedge Funds and Firm Value: All Hedge Funds

This table presents the coefficient estimates from OLS regressions. The dependent variable is *Tobin Q*, the industry median-adjusted Tobin's Q. The hedge fund data is from the (updated) dataset used in Brav et al. (2008) and covers the period 1995 to 2011. Firm-level data are from COMPUSTAT for the period 1995 – 2011.The sample includes firms targeted by hedge funds and control firms (identified using the Abadie-Imbens matching estimator described in Table 4). "*t*" is an indicator equal to one for the year in which a firm is targeted by a hedge fund, and zero for every other year before or after the targeting event year. This indicator is also equal to one for the matched control firm. "*HF_Target* × *t*" is an indicator equal to one for firms targeted by a hedge fund in the year of the targeting event, and zero for every year before or after the targeting event year. "*HF_Target* × *t*" is always equal to zero for the matched-control pairs (firms not targeted by a hedge fund). The other time dummies are defined similarly (see text for further details). We restrict the sample to non-financial firms. Refer to Table 1 for detailed variable definitions. In the table, *t*-statistics appear in brackets and are based on robust standard errors clustered by firm.

Dep. Var.: *TobinQ*	(1)	(2)	(3)	(4)	(5)	(6)
t-5	-0.206***	-0.139***				
	[-5.063]	[-3.212]				
t-4	-0.259***	-0.169***				
	[-6.515]	[-3.744]				
t-3	-0.290***	-0.187***				
	[-7.341]	[-3.907]				
t-2	-0.323***	-0.213***				
	[-7.465]	[-4.032]				
t-1	-0.397***	-0.283***				
	[-8.751]	[-4.858]				
t-4 to t-1			-0.300***	-0.171***	-0.282***	-0.160***
			[-8.187]	[-4.789]	[-6.978]	[-3.745]
t	-0.295***	-0.193***				
	[-5.462]	[-2.876]				
t+1	-0.246***	-0.143**				
	[-4.254]	[-2.089]				
t+2	-0.216***	-0.090				
	[-3.484]	[-1.137]				
t+3	-0.094	0.025				
	[-1.359]	[0.286]				
t to t+3			-0.204***	-0.063	-0.207***	-0.060
			[-3.767]	[-1.128]	[-3.856]	[-1.050]
Post t+3			-0.028	0.126	-0.030	0.128
			[-0.322]	[1.544]	[-0.352]	[1.571]
t+4	-0.126*	0.007				
	[-1.659]	[0.079]				
t+5	-0.090	0.079				
	[-1.037]	[0.821]				
Post t+5	-0.034	0.071				
	[-0.310]	[0.593]				
HF_Target × *t-4 to t-1*					-0.043	-0.028
					[-0.900]	[-0.448]
HF_Target × *t*	-0.177***	-0.162***				

	[-3.012]	[-2.840]				
HF_Target × t+1	-0.184***	-0.187***				
	[-2.772]	[-2.960]				
HF_Target × t+2	-0.088	-0.133*				
	[-1.197]	[-1.743]				
HF_Target × t+3	-0.255***	-0.288***				
	[-3.112]	[-3.568]				
HF_Target × t to t+3			-0.153***	-0.178***	-0.152***	-0.191***
			[-2.726]	[-3.221]	[-2.727]	[-2.713]
HF_Target × Post t+3			-0.170*	-0.257***	-0.169*	-0.270***
			[-1.839]	[-2.898]	[-1.831]	[-2.807]
HF_Target × t+4	-0.200**	-0.282***				
	[-2.216]	[-3.157]				
HF_Target × t+5	-0.198*	-0.276***				
	[-1.844]	[-2.718]				
HF_Target × Post t+5	-0.140	-0.232**				
	[-1.171]	[-1.968]				
LnSize	-0.141***	-0.538***	-0.141***	-0.540***	-0.141***	-0.540***
	[-6.963]	[-13.313]	[-6.943]	[-13.306]	[-6.930]	[-13.318]
Leverage	0.874***	0.521***	0.875***	0.523***	0.875***	0.522***
	[5.578]	[3.916]	[5.563]	[3.919]	[5.565]	[3.918]
CAPX	3.677***	2.689***	3.713***	2.719***	3.715***	2.719***
	[8.831]	[7.110]	[8.917]	[7.198]	[8.920]	[7.200]
R&D	5.408***	2.594***	5.410***	2.588***	5.413***	2.589***
	[13.437]	[6.058]	[13.425]	[6.041]	[13.435]	[6.043]
Intangibility	0.948***	1.117***	0.957***	1.130***	0.959***	1.130***
	[5.854]	[4.844]	[5.905]	[4.911]	[5.914]	[4.910]
4-digit SIC Industry-FE	Yes	No	Yes	No	Yes	No
Firm-FE	No	Yes	No	Yes	No	Yes
Year-FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	25,634	25,634	25,634	25,634	25,634	25,634
R-2	0.172	0.121	0.170	0.119	0.170	0.119

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Table 6 – Hedge Funds and Firm Value: Hostile Hedge Funds

This table presents the coefficient estimates from OLS regressions. The dependent variable is *TobinQ*, the industry median-adjusted Tobin's Q. The hedge fund data is from the (updated) dataset used in Brav et al. (2008) and covers the period 1995 to 2011. Firm-level data are from COMPUSTAT for the period 1995 – 2011. The sample includes firms targeted by hostile hedge funds and control firms (identified using the Abadie-Imbens matching estimator described in Table 4). "*t*" is an indicator equal to one for the year in which a firm is targeted by a hedge fund, and zero for every other year before or after the targeting event year. This indicator is also equal to one for the matched control firm. "*HHF_Target* × *t*" is an indicator equal to one for firms targeted by a hostile hedge fund in the year of the targeting event, and zero for every year before or after the targeting event year. "*HHF_Target* × *t*" is always equal to zero for the matched-control pairs (firms not targeted by a hostile hedge fund). The other time dummies are defined similarly (see text for further details). We restrict the sample to non-financial firms. Refer to Table 1 for detailed variable definitions. In the table, *t*-statistics appear in brackets and are based on robust standard errors clustered by firm.

Dep. Var.: *TobinQ*	(1)	(2)	(3)	(4)	(5)	(6)
t-5	-0.081	-0.077				
	[-1.187]	[-1.101]				
t-4	-0.175**	-0.148*				
	[-2.562]	[-1.879]				
t-3	-0.287***	-0.231***				
	[-4.106]	[-2.600]				
t-2	-0.346***	-0.277***				
	[-4.830]	[-2.744]				
t-1	-0.479***	-0.406***				
	[-5.694]	[-3.463]				
t-4 to t-1			-0.294***	-0.232***	-0.282***	-0.170**
			[-5.030]	[-3.872]	[-4.165]	[-2.292]
t	-0.335***	-0.211				
	[-3.549]	[-1.611]				
t+1	-0.294***	-0.160				
	[-2.980]	[-1.140]				
t+2	-0.212*	-0.071				
	[-1.961]	[-0.448]				
t+3	-0.180	-0.060				
	[-1.455]	[-0.336]				
t to t+3			-0.227**	-0.088	-0.227**	-0.064
			[-2.559]	[-0.872]	[-2.547]	[-0.602]
Post t+3			-0.142	0.081	-0.142	0.105
			[-1.118]	[0.534]	[-1.118]	[0.680]
t+4	-0.154	0.014				
	[-1.111]	[0.075]				
t+5	-0.111	0.118				
	[-0.725]	[0.574]				
Post t+5	-0.265*	-0.048				
	[-1.773]	[-0.202]				
HHF_Target × *t-4 to t-1*					-0.026	-0.130
					[-0.377]	[-1.438]
HHF_Target × *t*	-0.167**	-0.274***				

	[-2.378]	[-3.524]				
HHF_Target × t+1	-0.128	-0.278***				
	[-1.583]	[-3.013]				
HHF_Target × t+2	-0.095	-0.285***				
	[-1.019]	[-2.702]				
HHF_Target × t+3	-0.100	-0.267**				
	[-0.870]	[-2.081]				
HHF_Target × t to t+3			-0.123*	-0.277***	-0.126*	-0.337***
			[-1.769]	[-3.311]	[-1.725]	[-3.063]
HHF_Target × Post t+3			-0.005	-0.202	-0.007	-0.268*
			[-0.036]	[-1.420]	[-0.055]	[-1.683]
HHF_Target × t+4	-0.140	-0.356**				
	[-1.091]	[-2.459]				
HHF_Target × t+5	-0.192	-0.400**				
	[-1.247]	[-2.412]				
HHF_Target × Post t+5	0.166	0.025				
	[0.879]	[0.138]				
LnSize	-0.072***	-0.338***	-0.072***	-0.337***	-0.072***	-0.340***
	[-2.651]	[-6.120]	[-2.638]	[-6.104]	[-2.611]	[-6.148]
Leverage	0.226	0.159	0.227	0.165	0.228	0.166
	[1.338]	[0.829]	[1.343]	[0.862]	[1.348]	[0.871]
CAPX	3.054***	1.812***	3.062***	1.835***	3.061***	1.850***
	[6.110]	[3.943]	[6.090]	[3.973]	[6.088]	[4.008]
R&D	3.329***	0.963	3.348***	0.983	3.351***	0.979
	[5.880]	[1.359]	[5.910]	[1.385]	[5.916]	[1.382]
Intangibility	0.621***	0.468*	0.633***	0.487*	0.634***	0.491*
	[3.292]	[1.755]	[3.347]	[1.830]	[3.353]	[1.852]
4-digit SIC Industry-FE	Yes	No	Yes	No	Yes	No
Firm-FE	No	Yes	No	Yes	No	Yes
Year-FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	8,353	8,353	8,353	8,353	8,353	8,353
R-2	0.085	0.089	0.081	0.084	0.081	0.085

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Table 7 – The Limited Commitment Channel in Innovative Firms

This table presents the coefficient estimates from OLS regressions. The dependent variable is *TobinQ*, the industry median-adjusted Tobin's Q. The hedge fund data is from the (updated) dataset used in Brav et al. (2008) and covers the period 1995 to 2011. Firm-level data are from COMPUSTAT for the period 1995 – 2011. The sample includes firms targeted by hostile hedge funds and control firms (identified using the Abadie-Imbens matching estimator described in Table 4). "*LimitedCommitment*" is an indicator for firms facing limited commitment problems. We use three limited commitment proxies, "*High R&D*," "*High Intangibility*," and "*High Patent Citation*". The patent citation count data is from the NBER U.S. Patent Citations data file. "*HHF_Target*" is an indicator equal to 1 for firms targeted by a hostile hedge fund. "*(t to t+3)*" is an indicator for the years t (the year in which a firms is targeted by a hostile hedge fund) to t+3. "*(t-4 to t-1)*" is an indicator for the years from four years prior to one year prior the firm is targeted by a hostile hedge fund. We restrict the sample to non-financial firms. Refer to Table 1 for detailed variable definitions. In the table, *t*-statistics appear in brackets and are based on robust standard errors clustered by firm.

Limited Commitment Proxy:	**High R&D**	**High Intangibility**	**High Patent Citation**
	(1)	**(2)**	**(3)**
LimitedCommitment × HHF_Target × (t to t+3)	-0.818**	-0.434*	-0.841**
	[-2.153]	[-1.816]	[-2.312]
LimitedCommitment × HHF_Target × (t-4 to t-1)	-0.387	-0.019	-0.125
	[-1.187]	[-0.090]	[-0.360]
LimitedCommitment × (t-4 to t-1)	-0.247	-0.422***	-0.270
	[-1.055]	[-2.753]	[-1.081]
LimitedCommitment × (t to t+3)	-0.054	-0.242	0.420
	[-0.211]	[-1.491]	[1.570]
HHF_Target × (t to t+3)	-0.144*	-0.151*	-0.205**
	[-1.776]	[-1.742]	[-2.294]
(t to t+3)	-0.081	-0.036	-0.096
	[-1.340]	[-0.579]	[-1.594]
HHF_Target × (t-4 to t-1)	0.000	-0.057	-0.052
	[0.002]	[-0.726]	[-0.649]
(t-4 to t-1)	-0.163***	-0.090	-0.174***
	[-2.910]	[-1.580]	[-3.047]
LnSize	-0.334***	-0.340***	-0.332***
	[-6.240]	[-6.356]	[-6.158]
Leverage	0.196	0.173	0.167
	[1.037]	[0.916]	[0.872]
CAPX	1.836***	1.950***	1.789***
	[3.967]	[4.254]	[3.881]
R&D	0.924	0.985	1.012
	[1.300]	[1.371]	[1.425]
Intangibility	0.489*	0.570**	0.476*
	[1.846]	[2.230]	[1.787]
Firm-FE	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes
Obs.	8,353	8,353	8,353
R-2	0.092	0.093	0.087

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Table 8 – The Limited Commitment Channel in Firms with Important Stakeholders

This table presents the coefficient estimates from OLS regressions. The dependent variable is *TobinQ*, the industry median-adjusted Tobin's Q. The hedge fund data is from the (updated) dataset used in Brav et al. (2008) and covers the period 1995 to 2011. Firm-level data are from COMPUSTAT for the period 1995. The sample includes firms targeted by hostile hedge funds and control firms (identified using the Abadie-Imbens matching estimator described in Table 4). *StakeholderProxy* is an indicator for firms with important stakeholders. We use three proxies for important stakeholders: "*High Contract Specificity*," "*High Labor Productivity*," and "*High Unsecured Borrowing*". "*HHF_Target*" is an indicator equal to 1 for firms targeted by a hostile hedge fund. "*(t to t+3)*" is an indicator for the years t (the year in which a firms is targeted by a hostile hedge fund) to t+3. "*(t-4 to t-1)*" is an indicator for the years from four years prior to one year prior the firm is targeted by a hostile hedge fund. We restrict the sample to non-financial firms. Refer to Table 1 for detailed variable definitions. In the table, *t*-statistics appear in brackets and are based on robust standard errors clustered by firm.

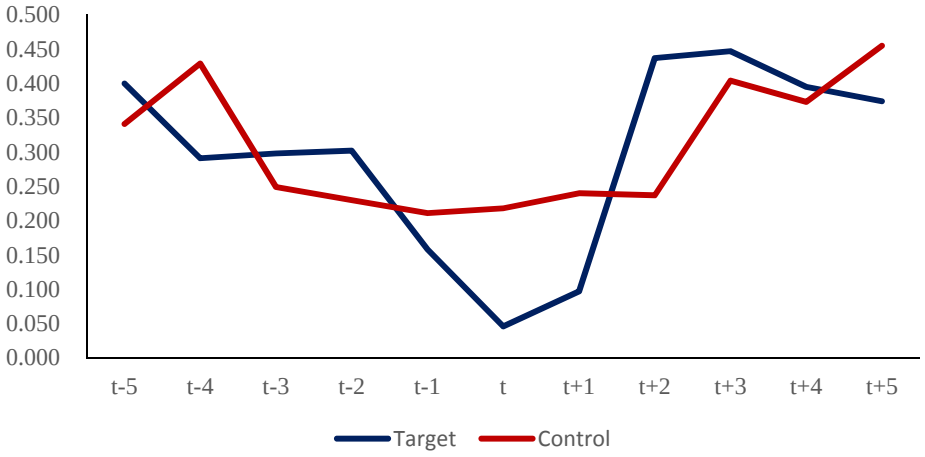
Important Stakeholder Proxy:	**High Contract Specificity**	**High Labor Productivity**	**High Unsecured Borrowing**
	(1)	**(2)**	**(3)**
StakeholderProxy × HHF Target × (t to t+3)	-0.652*	-0.422**	-0.441**
	[-1.718]	[-2.156]	[-1.973]
StakeholderProxy × HHF Target × (t-4 to t-1)	-0.693**	-0.294*	-0.144
	[-2.164]	[-1.784]	[-0.755]
StakeholderProxy × (t-4 to t-1)	0.327	0.160	0.031
	[1.236]	[1.468]	[0.276]
StakeholderProxy × (t to t+3)	0.253	0.353***	0.261**
	[0.776]	[2.796]	[2.123]
HHF Target × (t to t+3)	-0.010	-0.149	-0.176*
	[-0.035]	[-1.414]	[-1.824]
(t to t+3)	-0.082	-0.167**	-0.132*
	[-0.297]	[-2.276]	[-1.922]
HHF Target × (t-4 to t-1)	0.367	0.007	-0.045
	[1.469]	[0.067]	[-0.500]
(t-4 to t-1)	-0.429*	-0.231***	-0.193***
	[-1.838]	[-3.248]	[-2.954]
LnSize	-0.142	-0.335***	-0.332***
	[-1.089]	[-6.137]	[-6.207]
Leverage	-0.097	0.041	0.167
	[-0.216]	[0.227]	[0.885]
CAPX	1.298	1.767***	1.839***
	[0.835]	[3.825]	[3.974]
R&D	2.011	0.754	0.994
	[1.182]	[1.158]	[1.404]
Intangibility	1.165**	0.486*	0.469*
	[2.200]	[1.816]	[1.764]
Firm-FE	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes
Obs.	2,055	8,004	8,353
R-2	0.101	0.086	0.085

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

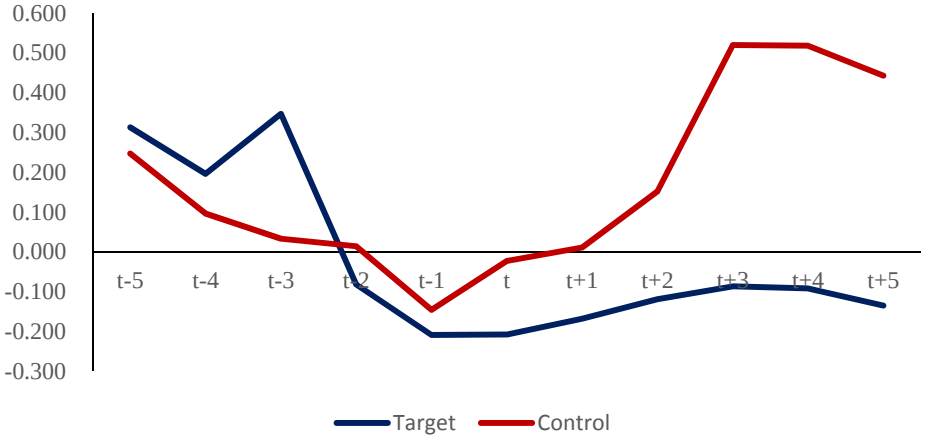
Figure 1 – Industry Median-Adjusted Tobin's Q for Hedge Funds Targets and their Matched-Control Firms in the Period from 5 Years before the Targeting Event to 5 Years After

This figure reports industry median-adjusted Tobin's Q for firms targeted by hedge funds (Panel A), firms targeted by hostile hedge funds (Panel B), and their matched control firms (identified using the Abadie-Imbens matching estimator described in Table 4) in the period from t-5 to t+5 (where t is the targeting year). The hedge fund data is from the (updated) dataset used in Brav. et al. (2008) and covers the period 1995 to 2011. Firm-level data are from COMPUSTAT for the period 1995. Refer to Table 1 for detailed variable definitions.

Panel A: Tobin's Q around the start of activist hedge fund campaigns (sample of all hedge funds campaigns)



Panel B: Tobin's Q around the start of hostile activist hedge fund campaigns (sample of hostile hedge fund campaigns only)



APPENDIX TO

HEDGE FUNDS AND LONG-TERM FIRM VALUE

Table A.1 – Delisting Reasons: Hedge Fund Targets and Matched-Control Firms

This table contains information on delisting reasons in the years after a firm has been targeted by a hedge fund, for either target or control firms. The delisting reasons are identified using the delisting code from CRSP. The hedge fund data is from the (updated) dataset used in Brav. et al. (2008) and covers the period 1995 to 2011.

Panel A: All Hedge Funds	Target: All Hedge Funds	Control	Combined
Delisting Reason:			
M&A	397	227	624
Security Exchanged for Security Trading in other Market	2	8	10
Firm's Liquidation	1	1	2
Delisted from NYSE, NYSE MKT, NASDAQ or Arca:			
Security Started Trading in Different Exchange	11	7	18
Security in Violation of Stock Exchange Requirement	187	125	312
Total	**598**	**368**	**966**

Panel B: Hostile Hedge Funds	Target: Hostile Hedge Funds	Control	Combined
Delisting Reason:			
M&A	121	64	185
Security Exchanged for Security Trading in other Market	1	3	4
Firm's Liquidation	0	1	1
Delisted from NYSE, NYSE MKT, NASDAQ or Arca:			
Security Started Trading in Different Exchange	2	2	4
Security in Violation of Stock Exchange Requirement	39	28	67
Total	**163**	**98**	**261**

Table A.2 – Controlling for Delisting Price (All Hedge Funds)

This table presents the coefficient estimates from OLS regressions. The dependent variable is *Tobin Q*, the industry median-adjusted Tobin's Q. The hedge fund data is from the (updated) dataset used in Brav et al. (2008) and covers the period 1995 to 2011. Firm-level data are from COMPUSTAT for the period 1995 – 2011. The sample includes firms targeted by hedge funds and control firms (identified using the Abadie-Imbens matching estimator described in Table 4). In this table, if a target firm or its matched-control firm delist from the stock exchange after the event year, we estimate Tobin's Q for the delisting year using the delisting price from CRSP and accounting information from COMPUSTAT (previous fiscal year). "*t*" is an indicator equal to one for the year in which a firm is targeted by a hedge fund, and zero for every other year before or after the targeting event year. This indicator is also equal to one for the matched control firm. "*HF_Target* × *t*" is an indicator equal to one for firms targeted by a hedge fund in the year of the targeting event, and zero for every year before or after the targeting event year. "*HF_Target* × *t*" is always equal to zero for the matched-control pairs (firms not targeted by a hedge fund). The other time dummies are defined similarly (see text for further details). We restrict the sample to non-financial firms. Refer to Table 1 for detailed variable definitions. In the table, *t*-statistics appear in brackets and are based on robust standard errors clustered by firm.

Dep. Var.: *TobinQ*	(1)	(2)	(3)	(4)	(5)	(6)
t-5	-0.205***	-0.135***				
	[-5.033]	[-3.119]				
t-4	-0.264***	-0.170***				
	[-6.618]	[-3.758]				
t-3	-0.281***	-0.175***				
	[-7.157]	[-3.661]				
t-2	-0.329***	-0.214***				
	[-7.515]	[-4.025]				
t-1	-0.392***	-0.273***				
	[-8.647]	[-4.670]				
t-4 to t-1			-0.299***	-0.167***	-0.278***	-0.151***
			[-8.131]	[-4.617]	[-6.850]	[-3.494]
t	-0.271***	-0.170**				
	[-5.065]	[-2.538]				
t+1	-0.233***	-0.128*				
	[-3.974]	[-1.837]				
t+2	-0.208***	-0.080				
	[-3.377]	[-1.015]				
t+3	-0.068	0.051				
	[-0.930]	[0.588]				
t to t+3			-0.185***	-0.043	-0.188***	-0.039
			[-3.400]	[-0.769]	[-3.492]	[-0.680]
Post t+3			-0.056	0.090	-0.059	0.093
			[-0.652]	[1.098]	[-0.687]	[1.136]
t+4	-0.141*	-0.007				
	[-1.856]	[-0.081]				
t+5	-0.110	0.058				
	[-1.285]	[0.600]				
Post t+5	-0.067	0.026				
	[-0.599]	[0.218]				
HF_Target × *t-4 to t-1*					-0.049	-0.038

					[-1.041]	[-0.621]
HF_Target × t	-0.201***	-0.178***				
	[-3.401]	[-3.081]				
HF_Target × t+1	-0.198***	-0.198***				
	[-2.933]	[-3.085]				
HF_Target × t+2	-0.091	-0.131*				
	[-1.226]	[-1.722]				
HF_Target × t+3	-0.291***	-0.320***				
	[-3.433]	[-3.866]				
HF_Target × t to t+3			-0.173***	-0.195***	-0.173***	-0.212***
			[-3.082]	[-3.514]	[-3.084]	[-3.015]
HF_Target × Post t+3			-0.136	-0.217**	-0.134	-0.235**
			[-1.481]	[-2.451]	[-1.470]	[-2.450]
HF_Target × t+4	-0.192**	-0.273***				
	[-2.117]	[-3.053]				
HF_Target × t+5	-0.172	-0.246**				
	[-1.638]	[-2.424]				
HF_Target × Post t+5	-0.095	-0.173				
	[-0.792]	[-1.440]				
LnSize	-0.137***	-0.533***	-0.136***	-0.535***	-0.136***	-0.535***
	[-6.758]	[-13.257]	[-6.739]	[-13.253]	[-6.723]	[-13.267]
Leverage	0.851***	0.505***	0.851***	0.506***	0.852***	0.506***
	[5.404]	[3.744]	[5.390]	[3.748]	[5.392]	[3.747]
CAPX	3.567***	2.579***	3.602***	2.606***	3.604***	2.606***
	[8.175]	[6.391]	[8.253]	[6.460]	[8.258]	[6.462]
R&D	5.295***	2.560***	5.297***	2.553***	5.301***	2.554***
	[13.156]	[5.960]	[13.147]	[5.947]	[13.160]	[5.951]
Intangibility	0.938***	1.155***	0.947***	1.166***	0.949***	1.166***
	[5.589]	[4.707]	[5.634]	[4.760]	[5.644]	[4.758]
4-digit SIC Industry-FE	Yes	No	Yes	No	Yes	No
Firm-FE	No	Yes	No	Yes	No	Yes
Year-FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	25,635	25,635	25,635	25,635	25,635	25,635
R-2	0.166	0.120	0.164	0.118	0.164	0.118

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Table A.3 – Controlling for Delisting Price (Hostile Hedge Funds)

This table presents the coefficient estimates from OLS regressions. The dependent variable is *TobinQ*, the industry median-adjusted Tobin's Q. The hedge fund data is from the (updated) dataset used in Brav et al. (2008) and covers the period 1995 to 2011. Firm-level data are from COMPUSTAT for the period 1995 – 2011. The sample includes firms targeted by hostile hedge funds and control firms (identified using the Abadie-Imbens matching estimator described in Table 4). In this table, if a target firm or its matched-control firm delist from the stock exchange after the event year, we estimate Tobin's Q for the delisting year using the delisting price from CRSP and accounting information from COMPUSTAT (previous fiscal year). "*t*" is an indicator equal to one for the year in which a firm is targeted by a hedge fund, and zero for every other year before or after the targeting event year. This indicator is also equal to one for the matched control firm. "*HHF_Target* × *t*" is an indicator equal to one for firms targeted by a hostile hedge fund in the year of the targeting event, and zero for every year before or after the targeting event year. "*HHF_Target* × *t*" is always equal to zero for the matched-control pairs (firms not targeted by a hostile hedge fund). The other time dummies are defined similarly (see text for further details). Refer to Table 1 for detailed variable definitions. In the table, *t*-statistics appear in brackets and are based on robust standard errors clustered by firm.

Dep. Var.: *TobinQ*	(1)	(2)	(3)	(4)	(5)	(6)
t-5	-0.086	-0.077				
	[-1.276]	[-1.106]				
t-4	-0.186***	-0.151*				
	[-2.736]	[-1.911]				
t-3	-0.281***	-0.214**				
	[-4.067]	[-2.413]				
t-2	-0.349***	-0.265***				
	[-4.925]	[-2.606]				
t-1	-0.483***	-0.393***				
	[-5.773]	[-3.336]				
t-4 to t-1			-0.296***	-0.224***	-0.280***	-0.161**
			[-5.099]	[-3.733]	[-4.149]	[-2.154]
t	-0.302***	-0.163				
	[-3.110]	[-1.211]				
t+1	-0.316***	-0.161				
	[-3.122]	[-1.122]				
t+2	-0.235**	-0.073				
	[-2.187]	[-0.462]				
t+3	-0.182	-0.040				
	[-1.425]	[-0.223]				
t to t+3			-0.226**	-0.072	-0.226**	-0.048
			[-2.517]	[-0.706]	[-2.504]	[-0.444]
Post t+3			-0.178	0.065	-0.178	0.090
			[-1.409]	[0.437]	[-1.408]	[0.589]
t+4	-0.203	-0.009				
	[-1.430]	[-0.047]				
t+5	-0.129	0.127				
	[-0.833]	[0.618]				
Post t+5	-0.306**	-0.059				
	[-2.015]	[-0.250]				
HHF_Target × *t-4 to t-1*					-0.035	-0.132
					[-0.504]	[-1.451]

HHF_Target × t	-0.178**	-0.276***				
	[-2.362]	[-3.370]				
HHF_Target × t+1	-0.109	-0.249***				
	[-1.281]	[-2.611]				
HHF_Target × t+2	-0.068	-0.245**				
	[-0.726]	[-2.319]				
HHF_Target × t+3	-0.131	-0.283**				
	[-1.132]	[-2.248]				
HHF_Target × t to t+3			-0.120*	-0.264***	-0.124*	-0.325***
			[-1.699]	[-3.149]	[-1.670]	[-2.945]
HHF_Target × Post t+3			0.037	-0.155	0.033	-0.222
			[0.283]	[-1.131]	[0.255]	[-1.438]
HHF_Target × t+4	-0.123	-0.330**				
	[-0.933]	[-2.256]				
HHF_Target × t+5	-0.187	-0.387**				
	[-1.207]	[-2.350]				
HHF_Target × Post t+5	0.233	0.101				
	[1.260]	[0.588]				
LnSize	-0.069**	-0.333***	-0.068**	-0.330***	-0.068**	-0.333***
	[-2.536]	[-6.109]	[-2.517]	[-6.073]	[-2.485]	[-6.124]
Leverage	0.186	0.115	0.186	0.122	0.187	0.123
	[1.119]	[0.614]	[1.122]	[0.648]	[1.128]	[0.657]
CAPX	2.970***	1.724***	2.980***	1.750***	2.979***	1.765***
	[5.947]	[3.797]	[5.938]	[3.844]	[5.936]	[3.882]
R&D	3.342***	0.992	3.359***	1.017	3.363***	1.014
	[5.871]	[1.405]	[5.900]	[1.437]	[5.908]	[1.433]
Intangibility	0.653***	0.569**	0.665***	0.586**	0.667***	0.589**
	[3.375]	[2.072]	[3.432]	[2.134]	[3.441]	[2.155]
4-digit SIC Industry-FE	Yes	No	Yes	No	Yes	No
Firm-FE	No	Yes	No	Yes	No	Yes
Year-FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	8,353	8,353	8,353	8,353	8,353	8,353
R-2	0.087	0.093	0.083	0.088	0.083	0.089

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Table A.4 – Controlling for 3-digit SIC Industry × Year Fixed Effects (All Hedge Funds)

This table presents the coefficient estimates from OLS regressions. The dependent variable is *TobinQ*, the industry median-adjusted Tobin's Q. The hedge fund data is from the (updated) dataset used in Brav et al. (2008) and covers the period 1995 to 2011. Firm-level data are from COMPUSTAT. The sample includes firms targeted by hedge funds and control firms (identified using the Abadie-Imbens matching estimator described in Table 4). "*t*" is an indicator equal to one for the year in which a firm is targeted by a hedge fund, and zero for every other year before or after the targeting event year. This indicator is also equal to one for the matched control firm. "*HF_Target* × *t*" is an indicator equal to one for firms targeted by a hedge fund in the year of the targeting event, and zero for every year before or after the targeting event year. "*HF_Target* × *t*" is always equal to zero for the matched-control pairs (firms not targeted by a hedge fund). The other time dummies are defined similarly (see text for further details). We restrict the sample to non-financial firms. Refer to Table 1 for detailed variable definitions. In the table, *t*-statistics appear in brackets and are based on robust standard errors clustered by firm.

Dep. Var.: *TobinQ*	(1)	(2)	(3)	(4)	(5)	(6)
t-5	-0.215***	-0.141***				
	[-4.905]	[-2.943]				
t-4	-0.263***	-0.156***				
	[-6.429]	[-3.088]				
t-3	-0.273***	-0.148***				
	[-6.477]	[-2.714]				
t-2	-0.311***	-0.173***				
	[-7.920]	[-2.841]				
t-1	-0.375***	-0.236***				
	[-9.100]	[-3.444]				
t-4 to t-1			-0.297***	-0.134***	-0.268***	-0.144***
			[-10.119]	[-3.143]	[-8.398]	[-2.951]
t	-0.266***	-0.160**				
	[-5.506]	[-2.050]				
t+1	-0.233***	-0.112				
	[-4.143]	[-1.412]				
t+2	-0.219***	-0.064				
	[-3.905]	[-0.693]				
t+3	-0.081	0.068				
	[-0.965]	[0.659]				
t to t+3			-0.200***	-0.031	-0.206***	-0.034
			[-5.889]	[-0.473]	[-5.919]	[-0.503]
Post t+3			0.027	0.198**	0.022	0.196**
			[0.527]	[2.031]	[0.430]	[2.013]
t+4	-0.083	0.067				
	[-0.976]	[0.634]				
t+5	-0.062	0.129				
	[-0.681]	[1.123]				
Post t+5	0.035	0.152				
	[0.543]	[1.044]				
HF_Target × *t-4 to t-1*					-0.064*	0.023
					[-1.761]	[0.338]
HF_Target × *t*	-0.176***	-0.111				

	[-2.852]	[-1.640]				
HF_Target × t+1	-0.186**	-0.147**				
	[-2.544]	[-1.963]				
HF_Target × t+2	-0.043	-0.043				
	[-0.497]	[-0.473]				
HF_Target × t+3	-0.220**	-0.212**				
	[-2.105]	[-2.275]				
HF_Target × t to t+3			-0.132***	-0.116*	-0.128***	-0.105
			[-3.245]	[-1.780]	[-3.147]	[-1.274]
HF_Target × Post t+3			-0.200***	-0.244**	-0.195***	-0.233**
			[-3.509]	[-2.351]	[-3.424]	[-2.061]
HF_Target × t+4	-0.184*	-0.209**				
	[-1.666]	[-2.086]				
HF_Target × t+5	-0.194	-0.222*				
	[-1.499]	[-1.911]				
HF_Target × Post t+5	-0.193**	-0.262*				
	[-2.505]	[-1.813]				
LnSize	-0.132***	-0.595***	-0.132***	-0.598***	-0.131***	-0.597***
	[-12.309]	[-13.082]	[-12.248]	[-13.098]	[-12.188]	[-13.111]
Leverage	0.942***	0.588***	0.945***	0.590***	0.945***	0.590***
	[10.147]	[4.162]	[10.165]	[4.170]	[10.160]	[4.171]
CAPX	4.003***	2.901***	4.034***	2.926***	4.036***	2.925***
	[11.084]	[6.918]	[11.139]	[6.988]	[11.140]	[6.988]
R&D	5.222***	2.406***	5.228***	2.404***	5.234***	2.403***
	[21.024]	[5.182]	[21.027]	[5.172]	[21.000]	[5.171]
Intangibility	0.966***	1.263***	0.977***	1.278***	0.978***	1.278***
	[9.238]	[4.698]	[9.304]	[4.767]	[9.311]	[4.767]
3-digit SIC Industry × Year	Yes	Yes	Yes	Yes	Yes	Yes
Firm-FE	No	Yes	No	Yes	No	Yes
Obs.	8,353	8,353	8,353	8,353	8,353	8,353
R-2	0.079	0.237	0.075	0.232	0.075	0.233

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.

Table A.5 –Controlling for 3-digit SIC Industry × Year Fixed Effects (Hostile Hedge Funds)

This table presents the coefficient estimates from OLS regressions. The dependent variable is *TobinQ*, the industry median-adjusted Tobin's Q. The hedge fund data is from the (updated) dataset used in Brav et al. (2008) and covers the period 1995 to 2011. Firm-level data are from COMPUSTAT. The sample includes firms targeted by hostile hedge funds and control firms (identified using the Abadie-Imbens matching estimator described in Table 4). "*t*" is an indicator equal to one for the year in which a firm is targeted by a hedge fund, and zero for every other year before or after the targeting event year. This indicator is also equal to one for the matched control firm. "*HF_Target* × *t*" is an indicator equal to one for firms targeted by a hedge fund in the year of the targeting event, and zero for every year before or after the targeting event year. "*HF_Target* × *t*" is always equal to zero for the matched-control pairs (firms not targeted by a hedge fund). The other time dummies are defined similarly (see text for further details). We restrict the sample to non-financial firms. Refer to Table 1 for detailed variable definitions. In the table, *t*-statistics appear in brackets and are based on robust standard errors clustered by firm.

Dep. Var.: *TobinQ*	(1)	(2)	(3)	(4)	(5)	(6)
t-5	-0.066	-0.024				
	[-0.750]	[-0.248]				
t-4	-0.181***	-0.096				
	[-2.710]	[-0.833]				
t-3	-0.313***	-0.173				
	[-4.849]	[-1.306]				
t-2	-0.374***	-0.206				
	[-6.177]	[-1.357]				
t-1	-0.537***	-0.357**				
	[-7.920]	[-2.033]				
t-4 to t-1			-0.334***	-0.213**	-0.309***	-0.144
			[-7.090]	[-2.217]	[-5.986]	[-1.248]
t	-0.361***	-0.135				
	[-5.108]	[-0.701]				
t+1	-0.325***	-0.087				
	[-3.722]	[-0.408]				
t+2	-0.221**	0.032				
	[-2.238]	[0.134]				
t+3	-0.163	0.062				
	[-1.284]	[0.224]				
t to t+3			-0.262***	-0.061	-0.263***	-0.033
			[-4.321]	[-0.383]	[-4.337]	[-0.202]
Post t+3			-0.176**	0.183	-0.178**	0.208
			[-2.220]	[0.767]	[-2.240]	[0.857]
t+4	-0.084	0.225				
	[-0.569]	[0.759]				
t+5	-0.127	0.303				
	[-0.850]	[0.996]				
Post t+5	-0.337***	0.095				
	[-3.806]	[0.262]				
HHF_Target × t-4 to t-1					-0.049	-0.140
					[-0.996]	[-1.070]
HHF_Target × t	-0.221**	-0.304***				

	[-2.377]	[-2.653]				
HHF_Target × t+1	-0.183*	-0.303**				
	[-1.758]	[-2.255]				
HHF_Target × t+2	-0.157	-0.322**				
	[-1.426]	[-2.103]				
HHF_Target × t+3	-0.181	-0.315*				
	[-1.196]	[-1.749]				
HHF_Target × t to t+3			-0.175***	-0.306**	-0.175***	-0.373**
			[-3.100]	[-2.577]	[-3.098]	[-2.374]
HHF_Target × Post t+3			-0.016	-0.256	-0.015	-0.326
			[-0.200]	[-1.155]	[-0.182]	[-1.353]
HHF_Target × t+4	-0.231	-0.464**				
	[-1.289]	[-2.238]				
HHF_Target × t+5	-0.264	-0.502**				
	[-1.290]	[-2.114]				
HHF_Target × Post t+5	0.227**	0.085				
	[2.046]	[0.269]				
LnSize	-0.060***	-0.440***	-0.059***	-0.438***	-0.059***	-0.441***
	[-4.143]	[-5.458]	[-4.075]	[-5.406]	[-4.028]	[-5.452]
Leverage	0.354***	0.217	0.356***	0.232	0.356***	0.231
	[3.110]	[0.873]	[3.114]	[0.940]	[3.120]	[0.935]
CAPX	3.474***	1.931***	3.482***	1.975***	3.479***	1.983***
	[7.612]	[2.888]	[7.513]	[2.944]	[7.493]	[2.959]
R&D	3.404***	0.414	3.425***	0.421	3.432***	0.422
	[7.983]	[0.518]	[8.056]	[0.525]	[8.067]	[0.528]
Intangibility	0.724***	0.636	0.738***	0.683	0.740***	0.687
	[4.370]	[1.493]	[4.458]	[1.612]	[4.470]	[1.629]
3-digit SIC Industry × Year	Yes	No	Yes	No	Yes	No
Firm-FE	No	Yes	No	Yes	No	Yes
Obs.	8,353	8,353	8,353	8,353	8,353	8,353
R-2	0.087	0.093	0.083	0.088	0.083	0.089

Note: ***, ** and * indicate statistical significance at the 1%, 5%, and 10% (two-tail) test levels, respectively.