

THE IMPACT OF HEDGE FUND ACTIVISM ON TARGET FIRM PERFORMANCE, EXECUTIVE COMPENSATION AND EXECUTIVE WEALTH

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Abstract

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This paper examines the relationship between hedge fund activism and target firm performance, executive compensation, and executive wealth. It introduces a theoretical framework that describes the activism process as a sequence of discrete decisions. The methodology uses regression analysis on a matched sample based on firm size, industry, and market-to-book ratio. All regressions control for industry and year fixed effects. Schedule 13D Securities and Exchange Commission (SEC) filings are the source for the statistical sample of hedge fund target firms. I supplement that data with target firm financial, operating, and share price information from the CRSP-COMPSTAT merged database. Activist hedge funds target undervalued or underperforming firms with high profitability and cash flows. They do not avoid firms with powerful CEOs. Leverage, executive compensation, pay for performance and CEO turnover increase at target firms after the arrival of the activist hedge fund. Target firm executives' wealth is more sensitive to changes in share price after hedge fund activism events suggesting that the executive team experiences changes to their compensation structure that provides incentive to take action to improve returns to shareholders. The top executives reap rewards for increasing firm value but not for increased risk taking.

Keywords: Hedge Funds, Investor Activism, Institutional Investors, Executive Compensation, Corporate Governance

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1. INTRODUCTION

Hedge funds are agents of change with specific goals that depend on the unique situations prevalent at the target company. Stronger financial incentives and higher levels of personal wealth at stake, light regulation, fewer conflicts of interest, and lockup provisions that restrict hedge fund investors from withdrawing funds all converge to make hedge funds effective in implementing change at target companies. Hedge fund managers have the means and incentive to focus on longer-term value-enhancing activities. In the course of making money for their investors, hedge funds often help overcome classic agency problems at publicly traded firms by removing poorly performing executives, by challenging bad strategies, and by ensuring that mergers and other management activities make

sense for the shareholders. Hedge funds have an important role to play in corporate governance — this study focuses on the impact of activism on target firm performance, executive compensation and executive wealth. Hedge funds are largely dependent on the target firm executive team, particularly the CEO, to implement strategies to achieve the hedge fund's desired objectives. Hedge funds may have preferences related to CEO characteristics and may use executive incentives to increase the likelihood of successful activism. In particular, I focus on the following questions: Can hedge fund activism be modelled as a sequential decision process and, if so, what are typical stages? What is the impact of hedge fund activism on firm performance, capital structure, and governance? Do hedge funds avoid target firms with powerful CEOs?

Is the wealth of target firm executives sensitive to stock price and volatility?

The literature finds that activism creates value by driving changes at target firms that improve long-term operating performance and corporate governance (e.g., Bebchuk, Brav, & Jiang, 2015, Katelouzou, 2013, and Brav, Jiang, Partnoy, & Thomas, 2008, Carrothers, 2017). Kahan and Rock (2007) find that hedge funds are critical players in both corporate governance and corporate control. Examples of corporate control activism include improving corporate governance through changes to executive compensation or to the board of directors (e.g., Armour & Cheffins, 2012 and Cheffins, 2013). Hartzell and Starks (2003) describe the corporate governance role of traditional institutional investors with respect to executive compensation. This paper seeks to understand the relationship between activism and executive compensation and wealth. It is unlikely that the most value enhancing activism tactic is to dramatically decrease executive compensation at target firms. Rather, most hedge fund activism is not hostile – changes often occur through persuasion, not force. The hedge fund depends on the level engagement of the executive team, and particularly the CEO, to implement strategies to achieve the hedge fund's desired results. Incentives for executives could change to reflect the goals of the activism agenda and certain CEO characteristics could influence the initial decision to target a particular firm. I explore the impact of CEO power on activist hedge fund targeting and the sensitivity of executive wealth to changes in stock price and volatility. Bebchuk, Martijn Cremers, & Peyer (2011) define CEO pay slice, CPS, as CEO total compensation divided by the sum of total compensation for the top five highest paid executives at a firm, and suggest that more powerful CEOs typically take a higher CEO pay slice. In my analysis, I use CPS as a proxy for CEO power.

This paper makes two primary contributions. First, it extends the knowledge that hedge fund activism is associated with higher levels of CEO turnover and higher levels of post-activism-event executive compensation by showing that, on average, funds do not avoid targeting firms with powerful CEOs (i.e., relative CEO power is not an important factor in activist hedge fund targeting). Moreover, to my knowledge, this is the first paper to examine the impact of activism on executive wealth by quantifying the effect of activism on the delta and vega of target firm executives' option holdings. The results indicate that the CEO has strong economic motivation to improve the share price of the target firm, but no significant motivation to assume additional risk for the firm. Overall, target firm executives' wealth is more sensitive to changes in share price after hedge fund activism events suggesting that the entire top executive team experiences change to their compensation structure that provides incentive to take action to improve returns to shareholders. The top executives are rewarded for increases in firm value but not for increased risk taking. Second, I introduce a general discrete theoretical framework to describe the decision-making process as hedge funds proceed through the stages of an activism campaign.

In addition, this study adds to the literature that hedge fund activism creates value. Hedge fund

activism appears to lead to increases in leverage and improvement in value (as measured by q). Overall, the results do not support the argument that activist hedge funds are short-term focused. For example, the temporary decrease in ROA and subsequent decrease in dividend payout are not consistent with short-term focused share price manipulation. Instead, the results are supportive of value creation by hedge funds. The sustained increase in q is consistent with the activist hedge fund agenda focusing on growth opportunities. Hedge funds appear to behave in a responsible manner by responding to temporary decreases in cash flow and return on assets with subsequent reductions in dividend payouts and share repurchases.

The rest of the paper proceeds as follows. Section 2 presents an illustrative example and develops a theoretical model for activism campaigns. Section 3 describes the data summarizes the results and Section 4 concludes.

2. ILLUSTRATIVE EXAMPLE AND THEORETICAL FRAMEWORK

2.1. Illustrative Example of an Escalating Activism Campaign

One of the more interesting and illustrative examples is the activism campaign at Canadian Pacific Railway Ltd. (Canadian Pacific or CP). This example clearly demonstrates a sequence of escalating stages including direct communication with CP directors and executives, an extensive media campaign, and a successful proxy battle that elected seven hedge fund nominees to the CP board of directors, ousted CP CEO Fred Green, and installed Hunter Harrison, legendary in railroad circles, as the new CEO responsible for driving operational efficiency improvements. Moreover, this example reflects the trend that the universe of hedge fund targets is expanding to include large, non-US firms.

During late September and early October of 2011, hedge fund Pershing Square Capital Management, L.P. (Pershing Square) began accumulating an ownership stake in Canadian Pacific TSX:CP, a major railway operation with a long and storied history. Pershing Square filed its original 13D on October 28, 2011, announcing beneficial ownership of 20,659,504 common shares representing 12.2% of the outstanding shares. Hedge fund managers such as Pershing Square's CEO Bill Ackman have achieved near mythical status in certain circles. The market responded as he publically discussed his intentions to work with the CP board and executive team to improve operating performance. Between September 22, 2011, and October 28, 2011, share price increased by more than 38% (i.e., from CAD 46.22 to CAD 63.80). Over the next six weeks, the price fluctuated as private discussions between the activist and the target appeared to be going nowhere. Typical of escalating hedge fund campaigns, the real action at CP had not yet begun. Through the fall of 2011, the relationship between Ackman and CP Chairman John Cleghorn had become increasingly hostile. Matters culminated in a January 4, 2012 email that Ackman subsequently released publicly. The contents provide insight into the escalation of an activism campaign. For those who are interested, the entire

email chain between the two is available publicly ("War of words: The e-mails that touched off a battle at CP", 2012) and makes for interesting reading.

*From: William A. Ackman
Sent: Wednesday, January 04, 2012 7:22 AM
To: John Cleghorn
Subject: War and Peace*

John,

I woke up early this morning thinking about my favorite Canadian railroad and it is causing me to become more interested in military history. We have had what the historians would likely call a border skirmish. It is not clear who fired the first shot, but a few people have been hurt, some egos have been bruised, and the arms dealers (the media) are calling for and attempting to gin up a fight. They of course sell more papers if a fight occurs so their motives are clear.

When a border skirmish takes place, sometimes it leads to full out war and other times, things die down, borders are redrawn and peace can remain in both lands.

The choices from here as I see them are (1) representatives from our side and your side sit down and work this out promptly. Working it out, in my view, is the quick addition to the board of two representatives from our side, and Hunter's hiring as CEO. The second alternative is that we will be forced to launch a proxy contest for the upcoming annual meeting where we will seek to replace a greater number of the existing directors with extremely highly regarded business executives who share our belief that management and board change is necessary at CP.

In the proxy contest, as a first step, we will take the largest public hall you have available in Toronto and will make a presentation to shareholders and the public (which will be simulcast on the Internet) about management and board failure over the last 10 years at CP. We will examine management's and the board's track record and history in CP...

This proxy contest will not go well for the board and Fred. The track record is very poor, shareholders are disgruntled, and we are offering an alternative with a legendary reputation. An analyst at Morgan Stanley, your advisor in this matter, is now writing of a "super-bull" case if Hunter is hired. Don't rely on my opinion on this, just ask your proxy advisors.

Based on yesterday and my not receiving a return call from you, the probability of war occurring has gone up meaningfully. War is not my preference and it has been extremely rare for us. We have had only two proxy contests in 25 or so active engagements with public companies over the last eight years.

War is also not inevitable.

I think the failures so far have been largely ones of communication...

My impression of you when we first met was quite favorable. You seem like a solid, good man. I would like to resolve this situation

amicably in the best interest of shareholders as I am sure you would.

To throw out alternative ideas, I am open to not serving on the board as long as I am comfortable that we are adequately represented by directors that we designate (that of course you have to approve) and we are comfortable with the composition of the rest of the board.

Let's avoid having a border skirmish turn into a nuclear winter. Life is too short.

Please call me when you can.

Sincerely,

Bill

True to his word, Ackman set to work on the proxy battle, taking full advantage of an extensive media campaign including a public "town hall meeting" in Toronto on February, 6, 2012 and an April 4, 2012 letter to shareholders criticizing CP's incumbent CEO and board, and detailing his plans and rationale for change. On May 12, 2012, the Globe and Mail reported that "The Canada Pension Plan Investment Board has backed activist investor Bill Ackman's entire slate of nominees for Canadian Pacific Railway Ltd.'s board and withheld votes from incumbent directors at the railway." On May 17, 2012, the CP annual meeting resulted in a successful proxy contest that elected seven Pershing Square nominees, including Ackman, to the CP board of directors. The new board ousted CP CEO Fred Green, and installed Hunter Harrison, legendary in railroad circles, as the new CEO responsible for driving operational efficiency improvements. In April 2013, CPR announced the best quarterly results in its 132 year history and the share price peaked at CAD 142.42 on May 17, 2013 (i.e., up more than 86% from the annual meeting). Pershing Square had built up an ownership stake of 24 million shares (14.2% of the outstanding CP shares worth CAD 3.4 billion). As a testament to the ability of hedge funds to move financial markets, on June 3, 2013 when Pershing Square announced the intention to capitalize some of its gains by reducing its ownership position to 10% over time, share price immediately dropped 3%. On October 23, 2013, CP announced record third quarter profits as a direct result of its focus on efficiency resulting in the lowest operating ratio in company history, and the share price broke through CAD 150.

Figure 1. Canadian Public Stock Performance. July 1, 2011 to December 31, 2013

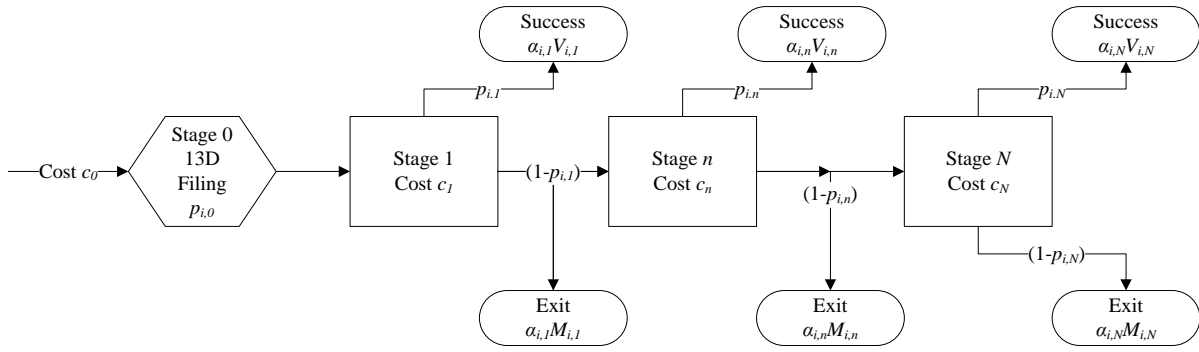
Notes: September 22, 2011, CAD 46.22 — Pershing Square begins to accumulate shares in TSX:CP
 October 28, 2011, CAD 63.80 — Pershing Square files original 13D
 January 4, 2012, CAD 70.60 — Ackman email to CP's Cleghorn
 February 6, 2012, CAD 74.34 — Ackman and Harrison hold public "Town Hall" meeting
 April 4, 2012, CAD 75.34 — Ackman letter to shareholders
 May 17, 2012, CAD 76.51 — CP Annual Meeting — Successful proxy contest and CEO replacement
 April 13, 2013, CAD 125.61 — CP announces best quarterly results in its 132-year history
 May 17, 2013, CAD 142.42 — One year after proxy contest and CEO ouster, share price is up 86%
 June 5, 2013, CAD 126.00 — Share price drops as Pershing Square announces intention to reduce ownership position to 10%
 October 23, 2013, CAD 148.53 — Share price exceeds CAD 150 on intraday trading on CP announcement of record 3rd quarter results and the best operating ratio in company history

2.2. Theoretical Framework

The literature provides examples of diverse approaches to modeling activist hedge fund behavior. For example, Brav and Matthews (2011) use game theory to study empty voting, Gantchev (2013) uses a sequential decision model to define hedge fund activism as a series of escalating stages of intervention, and Erlwein and Müller (2011) employ a regime switching regression model in their study of hedge funds. In this paper, I examine the interrelation between the behavior of activist hedge funds and the impact on firm performance and executive wealth at target firms. Activist hedge funds identify undervalued and underperforming companies and then acquire a minority position in the target with the intent of profiting from the increase in overall return (i.e., capital gain or increased dividend) achieved through the exercise and enforcement of minority shareholder rights. A key feature of activist hedge funds is that they acquire blocks of shares with the intention of pressuring management action without obtaining a majority stake (e.g., Brav, Dasgupta & Mathews, 2017, Boyson & Pichler, 2016, Brav, Jiang & Kim, 2009). What motivates activist hedge funds to behave as they do? Assume that activist hedge funds are rationale and given that activism is costly, the hedge fund must expect that the benefits that accrue to the hedge fund will outweigh the costs it incurs. At the time of acquiring an ownership position in

the target, the expected benefit of the position must exceed the expected cost. Because the hedge fund holds a minority equity stake in the target company, the activist hedge fund bears all of the cost of the activism but receives only a fraction of the improvement of returns to target company shareholders. Gantchev (2013) models hedge fund activism as a sequential decision process consisting of demand negotiations, board representation, proxy threats, and proxy fights — the activist hedge fund's decision is a discrete choice problem. While there is precedence in the literature to characterize the activism process as continuous (e.g., Tirole, 2001 and Gillan & Starks, 2007), the decision of a hedge fund to target a particular firm for activism is clearly binary, and once the activist hedge fund is engaged, the fund typically proceeds in an escalating series of discrete decisions. Figure 2 depicts hedge fund activism as a sequential decision process — the framework is general. In the CP example, the hedge fund tactics became increasingly aggressive: Stage 1) change through communication with the board of directors and senior management; Stage 2) change through seeking representation on board of directors without a proxy contest or management confrontation; Stage 3) change through formal shareholder proposals and public letters; Stage 4) change through threat of proxy fight; and Stage 5) change through proxy contests to replace the board of directors (and subsequently the CP CEO).

Figure 2. The activism process as a sequence of discrete decisions



Notes: Stage 0 represents the decision of the hedge fund to acquire an ownership stake, $\alpha_{i,0}$, in target firm i with the intent of agitating for change to unlock target firm value, $V_{i,0}$. The hedge fund makes this decision with probability $p_{i,0}$ based on an evaluation that costs c_0 . The hedge fund proceeds with activism whenever the expected benefits exceed the (expected) costs. At each subsequent stage, success is defined as reaching agreement with target firm management to make changes that will permit the market value of the firm to reflect its fundamental value, $V_{i,n}$. The probability of success at any stage, n , is $p_{i,n}$. If the activism campaign is not successful at stage n , the hedge fund will choose (with probability $1-p_{i,n}$) the better of liquidating its ownership position in the target firm at current market prices, $\alpha_{i,n}M_{i,n}$, or continuing to the next stage of activism at cost c_{n+1} . In the final stage, N , the hedge fund either succeeds (with probability $p_{i,N}$) with the activism campaign that will ultimately achieve the firm's fundamental value, $V_{i,N}$ or fails (with probability $1-p_{i,N}$) with the campaign an exits its ownership position at a value equal to $\alpha_{i,N}M_{i,N}$.

Let $n \in \{0, 1, \dots, N\}$ be the activist choice set with $n = 0$ being the Schedule 13D filing stage, and let $U_{i,n}$ be the hedge fund's utility associated with target firm i at activism stage n . Assume that the hedge fund's utility is a function of the profitability of the activism — the decision to pursue firm i as a target depends on the expected benefits exceeding the costs. The benefits realized by the hedge fund equal the pro rata share of the increase in the market value of the firm based on the ownership position of the hedge fund plus any private benefits available exclusively to the hedge fund. Private benefits could include greenmail and empty voting. Greenmail occurs when the target firm agrees to purchase, at a premium to market value, the block of shares held by the hedge fund, on the condition that the hedge fund ceases to engage in further activism at the target. Empty voting (e.g., Brav and Matthews, 2011) occurs when the hedge funds eliminate the economic exposure of its position in the target (through derivatives, for example) while retaining its

voting rights. If the hedge fund holds an equity position in a third firm that the target firm intends to acquire, the hedge fund could vote in favor of the acquisition (directly benefiting the hedge fund by increasing the share price of the third firm) while hurting the other shareholders of the target. Widespread adoption of anti-greenmail provisions and the empirical results that hedge fund activism is generally associated with abnormal positive returns at the target provide strong evidence that the impact of private benefits is small (Armour and Cheffins, 2012). I proceed under the simplifying assumption that, in general, the private benefits of hedge fund activism are negligible.

Let $U_{i,n}^c$ be the utility of continuing (at stage n) the activist campaign in an effort to unlock that target firm i 's fundamental value, $V_{i,n}$, and $U_{i,n}^e$ be the utility of exiting by liquidating at current market value, $M_{i,n}$. At any stage in the hedge fund activism process, the following must be true:

$$U_{i,n}^c = -\sum_{i=0}^{n+1} c_i + p_{i,n+1} E(\alpha_{i,n+1} V_{i,n+1}) + (1 - p_{i,n+1}) E[\max(\alpha_{i,n+1} M_{i,n+1}, U_{i,n+1}^c)] \quad (1)$$

$$U_{i,n}^e = -\sum_{i=0}^n c_i + \alpha_{i,n} M_{i,n} \quad (2)$$

The hedge fund will continue to the next stage of the activist agenda with target firm i when $U_{i,n}^c > U_{i,n}^e$ or

$$p_{i,n+1} E(\alpha_{i,n+1} V_{i,n+1}) + (1 - p_{i,n+1}) E[\max(\alpha_{i,n+1} M_{i,n+1}, U_{i,n+1}^c)] - \alpha_{i,n} M_{i,n} - c_n > 0$$

At the final stage of activism (denoted N), the hedge fund either exits at market value or succeeds

in unlocking the target firm's fundamental value and will ultimately liquidate when market price equals

fundamental value. The decision at $N-1$ is based on:

$$U_{i,N-1}^c = -\sum_{i=0}^N c_i + p_{i,N} E(\alpha_{i,N} V_{i,N}) + (1 - p_{i,N}) E(\alpha_{i,N} M_{i,N}) \quad (3)$$

$$U_{i,N-1}^e = -\sum_{i=0}^{N-1} c_i + \alpha_{i,N-1} M_{i,N-1} \quad (4)$$

The hedge fund will continue to the final activism stage when $U_{i,N-1}^c > U_{i,N-1}^e$ or

$$p_{i,N} E(\alpha_{i,N} V_{i,N}) + (1 - p_{i,N}) E(\alpha_{i,N} M_{i,N}) - \alpha_{i,N-1} M_{i,N-1} - c_N > 0$$

In general, costs, C_i include: a) search costs - all costs associated with evaluating potential targets, b) acquisition costs - transaction and financing costs associated with acquiring the shares of the target company, c) activism campaign costs - all costs (e.g. communication costs, legal fees, and regulatory filing fees) associated with the chosen activism, d) indirect costs - opportunity costs of the lost benefit of diversification and reduced liquidity of owning a significant block of shares in the target. Total costs are the sum of all stage costs up to the decision to exit. I expect stage costs to be monotonically increasing. U.S. security regulation requires firms to make a 13D filing within 10 days of acquiring 5% of the outstanding shares in a publicly traded company with the intent to influence the company (i.e. firms can quietly acquire approximately 5% of outstanding shares in a target firm before having to publically announce activist intentions). It is well documented (e.g., Brav, Jiang, Partnoy, and Thomas, 2008) that the share price of the target company increases abnormally in the event window surrounding the 13D filing. If the abnormal return at the target reflects a substantial proportion of the difference between market value and fundamental value of the

target firm, the activist hedge funds can capture approximately 5% of the total value of this abnormal return. However, a realistic value for $\alpha_{i,n}$ is greater than 0.05 because activist hedge funds often continue to increase their holdings in the target firm, and activist hedge funds can leverage their effective exposure to returns through derivatives (Armour and Cheffins, 2012).

For activism to improve utility for the hedge fund, I expect that the target company to be both undervalued and underperforming - the market price of an undervalued, underperforming firm does not reflect the fundamental value of the firm. In principle, any investor can profit by buying the undervalued firm and waiting for the market to get the price right. When a firm is underperforming, it implies that there is something structurally wrong and that by taking action to force change, the activist hedge fund's effort will lead to improved performance at the target company that will ultimately be reflected in increased share price or dividends.

At the time the hedge fund is evaluating firm i as a candidate for activism:

$$U_{i,0}^c = -c_0 - c_1 + p_{i,1} E(\alpha_{i,1} V_{i,1}) + (1 - p_{i,1}) E[\max(\alpha_{i,1} M_{i,1}, U_{i,1}^c)] \quad (5)$$

$$U_{i,0}^e = -c_0 \quad (6)$$

The literature finds that a decrease in target firm share price often occurs in the months preceding the hedge fund's decision to proceed with the activism campaign (e.g., Gantchev & Jotikasthira, 2015 and Carrothers, 2017). In terms of the model, the utility of the activism opportunity increases and the cost of entry decreases. The hedge fund will pursue target firm i when $U_{i,0}^c > U_{i,0}^e$ or $p_{i,1} E(\alpha_{i,1} V_{i,1}) + (1 - p_{i,1}) E[\max(\alpha_{i,1} M_{i,1}, U_{i,1}^c)] - c_1 > 0$.

The probability that a firm will be a target of hedge fund activism depends on the probability that $U_{i,0}^c > U_{i,0}^e$ which depends on the: a) probability that the hedge fund reaches agreement with the target firm management at the first activism stage, b) costs of each stage of activism (directly on the cost of the first stage, C_i , and indirectly on subsequent stages through $U_{i,1}^c$), c) fundamental value of the target

firm $V_{i,1}$, and d) market value of the firm after targeting, $M_{i,1}$.

3. DATA AND RESULTS

3.1 Data

Per the 1934 Securities Exchange Act, Section 13(d), investors who acquire beneficial ownership of more than 5% of the shares of a publicly traded company and who plan to exert influence over the control of that company must disclose their ownership position and their intent within ten days of taking the position. In addition, firms must identify the reason(s) for acquiring the shares (Brav, Jiang, & Kim, 2009). For this analysis, the hedge fund activism events are 1220 Schedule 13D filings from July 17, 1995, and December 26, 2007 involving 223 unique hedge funds making Schedule 13D filings

regarding 1007 unique target firms. The 13D filing date is a good proxy for the date at which the hedge fund's intentions become public information. At the time of filing, copies go to each exchange where the security is traded and to the firm that issued the securities. SEC regulations require prompt amendment for any material changes in the facts contained in the schedule. I complemented the hedge fund data with target firm financial, operating, and share price information from the CRSP-COMPUSTAT merged database. The subsequent analysis uses the combination of firm and year as the unique identifier, so the number of usable observations decreases. First, of the 1220 events, 73 target companies have two or more Schedule 13D filings in a given year. Second, not all

of the targets firms have stock price information in CRSP, company performance information in COMPUSTAT. Of the 1007 companies in the initial hedge database, I base my subsequent regression analyses on 613 event-year matches corresponding to 540 unique target companies and 198 hedge fund companies. I winsorize all variables at the top and bottom one percent. Appendix A provides detailed definitions of variables used in this study.

3.2 Discussion of Results

Table 1 provides a summary of activist hedge fund events (i.e., 13D filings) by disclosed tactics and objectives.

Table 1. Summary of activist hedge fund events by stated objective and tactic

Panel A		
Hedge Fund Objective	# of events	% of total events
General undervaluation	579	47.5%
Governance	300	24.6%
Business strategy	280	23.0%
Sale of target company	244	20.0%
Capital structure	212	17.4%
Panel B		
Tactic	# of events	% of total events
Passive investment	300	24.6%
Change through communication with the board of directors and senior management	322	26.4%
Change through seeking representation on board of directors without a proxy contest or management confrontation	145	11.9%
Change through formal shareholder proposals or public letters	426	34.9%
Change through threat of lawsuit or proxy fight	88	7.2%
Change through proxy contests to replace the board of directors	164	13.4%
Change through proceeding with lawsuit against target	63	5.2%
Change through takeover bid	56	4.6%

Note: The sample includes 1220 events from 1995 to 2007. Panel A presents a summary of the objectives of the hedge fund as declared in the 13D filing with the SEC. "General undervaluation" indicates that the intent of the hedge fund was non-specific, such as improving the company or improving shareholder value. (This information was usually in Item 4 of the 13D filing, sometimes confirmed from news articles. This objective is mutually exclusive of the remaining objective categories). "Governance" indicates one of the following: takeover defenses; CEO/chairman replacement; board independence or fair representation; information disclosure; fraud; executive compensation. "Business strategy" indicates that the hedge fund targets one of the following: lack of business focus; excess diversification; business restructuring including spinning off of business segments; want to block a pending M&A deal involving the company or wants to change the terms; growth strategy. "Sale of target company" indicates that the hedge fund targets one of the following: sale of the company or its main assets to a third party; take majority control of the company; buy-out the company; take the company private. "Capital structure" indicates that the hedge fund targets one of the following: excess cash; under-leverage; restructuring of debt; recapitalization; share repurchase; dividend payment; equity issuance. Panel B summarizes tactics employed by the hedge fund to achieve the stated objectives.

Item 4 of the Schedule 13D filing identifies the *purpose of the transaction* — this information plus supplemental news and internet searches is the source data for the objectives and tactics; Item 5 describes the *interest in securities of the issuer* which provides specific information regarding beneficial ownership level (e.g., this item provided the information of Pershing Square's ownership position in CP in the previous example). The totals in Table 1 exceed 100% because hedge funds often identify multiple objectives and use multiple tactics. The first objective, *general undervaluation* (47.5%), is mutually exclusive of the others and describes

events in which the hedge fund plans to solve the undervaluation issues using tactics that are no more aggressive than communication with the target firm's executive officers and board of directors. *Governance* (24.6%) means that the hedge fund plans to focus on any of executive compensation, takeover defenses, CEO or chairman replacement, board independence or fair representation, information disclosure, or fraud. *Business strategy* (23.0%) targets business focus, excess diversification, business restructuring, growth strategy, or blocking or renegotiating a pending merger and acquisition (M&A) deal. *Sale of target company* (20.0%) indicates

a focus on the sale of the company or its main assets to a third party, taking majority control of the company, or taking the company private. *Capital structure* (17.4%) indicates that the hedge fund is focused on any of the following at the target firm: excess cash, leverage, debt structure, recapitalization, share repurchase, dividend payment, or equity issuance.

As illustrated by the Canadian Pacific example in the previous section, hedge fund activism often proceeds through a sequence of escalating steps (Gantchev, 2013). Panel B summarizes (in order of escalating activism) the tactics that activist hedge funds use achieve stated objectives — tactics can be non-hostile or hostile. Non-hostile tactics include passive investment (24.6%), change through communication with the board of directors and senior management (26.4%); and change through seeking representation on the board of directors

without a proxy contest or management confrontation (11.9%). Change through formal shareholder proposals or public letters (34.9%) can be either hostile or non-hostile. Hostile tactics include change through the threat of a lawsuit or proxy fight (7.2%), change through proxy contests to replace the board of directors (13.4%), change through proceeding with a lawsuit against the target (5.2%), and change through takeover bid (4.6%). Each of these tactics represents a different stage in the Section 2.3 model. The specifics of a particular activism campaign will determine the number of stages before the hedge fund chooses to exit. In the case of a hedge fund holding a passive investment, there is a single stage with minimal activism costs. The “activism campaign” is successful when the hedge fund sells its stake in the target when the share price returns to its intrinsic or fair value.

Table 2. Summary statistics of firm characteristics

Panel A - Matched Firms (5 Nearest Neighbors)

<i>Variable</i>	<i>Measure of</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
Employees (thousands)	Size	5.0	14.0	0.2	0.7	3.4
Total Assets _{t-1} (\$millions)	Size	2170.6	8581.7	54.1	231.9	941.4
Total Sales _{t-1} (\$millions)	Size	1026.8	3416.0	32.9	134.9	583.6
Total Market Value _{t-1} (\$millions)	Size	1792.3	6539.4	60.5	236.1	974.1
Total Market Value of Equity _{t-1} (\$millions)	Size	1116.2	3964.8	40.9	157.1	637.7
Return on Assets _{t-1}	Profitability	0.060	0.218	0.019	0.088	0.164
Return on Equity _{t-1}	Profitability	-0.049	0.785	-0.064	0.070	0.139
Stock Return _{t-1}	Profitability	0.123	0.719	-0.276	0.014	0.311
Dividend Yield _{t-1}	Profitability	0.023	0.046	0.000	0.000	0.028
Sales Growth _{t-1}	Growth	0.195	0.602	-0.024	0.084	0.237
Market to Book Ratio _{t-1}	Growth	2.220	3.727	1.022	1.652	2.708
q _{t-1}	Growth	2.097	2.225	1.049	1.413	2.247
Leverage _{t-1}	Growth	0.348	0.319	0.037	0.308	0.562
Free Cash Flow _{t-1} (\$millions)	Growth	47.2	280.2	-4.6	2.2	24.5
Free Cash Flow Ratio _{t-1}	Growth	-0.032	0.233	-0.045	0.011	0.065
(Research & Development/Total Assets) _{t-1}	Growth	0.042	0.109	0.000	0.000	0.025

Panel B - Firms subject to hedge fund activism between 1995 and 2007

<i>Variable</i>	<i>Measure of</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
Employees (thousands)	Size	5.4	14.3	0.2	1.2	4.1
Total Assets _{t-1} (\$millions)	Size	1911.0	7178.1	89.0	310.5	989.7
Total Sales _{t-1} (\$millions)	Size	1109.2	3358.8	63.0	244.2	823.9
Total Market Value _{t-1} (\$millions)	Size	1708.6	5982.0	88.5	310.9	1137.5
Total Market Value of Equity _{t-1} (\$millions)	Size	1119.1	3840.0	59.1	203.5	783.4
Return on Assets _{t-1}	Profitability	0.072	0.173	0.018	0.088	0.160
Return on Equity _{t-1}	Profitability	-0.030	0.772	-0.077	0.051	0.131
Stock Return _{t-1}	Profitability	0.079	0.639	-0.263	0.000	0.275
Dividend Yield _{t-1}	Profitability	0.027	0.053	0.000	0.001	0.033
Sales Growth _{t-1}	Growth	0.119	0.508	-0.040	0.057	0.167
Market to Book Ratio _{t-1}	Growth	2.110	3.777	0.965	1.608	2.632
q _{t-1}	Growth	1.868	1.628	1.024	1.406	2.194
Leverage _{t-1}	Growth	0.346	0.326	0.020	0.306	0.561
Free Cash Flow _{t-1} (\$millions)	Growth	55.6	304.9	-6.1	3.1	34.8
Free Cash Flow Ratio _{t-1}	Growth	0.001	0.200	-0.032	0.016	0.074
(Research & Development/Total Assets) _{t-1}	Growth	0.037	0.085	0.000	0.000	0.027

Note: The table shows summary statistics of firm characteristics based on observations from 1995 to 2007. The subscript t-1 indicates prior year. Panel A presents data for matched firms (5 nearest neighbors) based on logarithmic market value of equity, market to book ratio, and 3-digit SIC code from the Compustat universe during

the subject years; Panel B presents data for firms subject to hedge fund activism events between the years 1995 and 2007. See Appendix A for definitions of all variables.

Table 2 presents summary statistics of firm characteristics based on observations from 1995 to 2007. All data are fiscal year end of the year prior to the 13D filing since hedge funds make their acquisition decisions based on firm information that is available at the time of the decision analysis. Panel A presents data for matched firms, specifically the five nearest neighbors based on market value of equity, market to book ratio, and industry (3 digit SIC code) from the COMPUSTAT universe during the subject years. These three criteria are the basis for generating matched sample regression results elsewhere in the paper. Panel B presents data for firms subject to targeting by hedge funds. Compared to matched firms, targets have: a) lower q , sales

growth, and investment in R&D; b) similar return on assets, c) lower yields from equity markets (i.e., combined stock return and dividend & share repurchase yield) d) similar levels of leverage and e) better cash flows. Since market value of equity was one of the matching criteria, the target and matched firms are similar in size. With respect to the theoretical model in section 2.3, the hedge funds are behaving like value investors at Stage 0 — typical target firms are financially sound with strong cash flows but are currently out-of-favor with the market as indicated by prior period market returns and q . It is reasonable that hedge funds seek an opportunistic entry price.

Table 3. Summary statistics of executive characteristics

Panel A - Matched Firms (5 Nearest Neighbors)

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
CEO Indicator	0.155	0.362	0	0	0
Gender Indicator	0.047	0.212	0	0	0
Tenure	10.7	6.9	7.0	9.0	12.6
CEO Pay Slice	0.366	0.124	0.294	0.365	0.436
Total Compensation	1910.1	2786.6	483.3	958.6	2059.9
<i>CEOs only</i>					
Gender Indicator	0.011	0.104	0	0	0
Tenure	17.0	9.0	11.7	16.2	21.0
Total Compensation (\$000s)	3881.2	4297.3	1065.5	2200.7	4921.2
<i>NEOs excluding CEOs</i>					
Gender Indicator	0.054	0.226	0	0	0
Tenure	9.5	5.8	6.7	8.7	11.0
Total Compensation (\$000s)	1493.3	2123.1	435.5	825.0	1650.6

Panel B - Firms subject to hedge fund activism between 1995 and 2007

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>p25</i>	<i>p50</i>	<i>p75</i>
CEO Indicator	0.154	0.361	0	0	0
Gender Indicator	0.064	0.245	0	0	0
Tenure	10.0	6.7	6.0	8.5	12.0
CEO Pay Slice	0.369	0.123	0.296	0.372	0.440
Total Compensation (\$000s)	1787.7	2642.0	484.3	935.6	1911.2
<i>CEOs only</i>					
Gender Indicator	0.040	0.196	0	0	0
Tenure	15.9	9.1	9.0	15.6	20.9
Total Compensation	3724.6	4145.8	1102.1	2243.8	4646.3
<i>NEOs excluding CEOs</i>					
Gender Indicator	0.068	0.252	0	0	0
Tenure	8.9	5.6	5.9	7.9	11.0
Total Compensation (\$000s)	1379.0	1966.9	436.9	806.0	1520.7

Notes: The table shows summary statistics of executive characteristics based on observations from 1995 to 2007. Panel A presents data for matched firms (5 nearest neighbors) based on logarithmic market value of equity, market to book ratio, and 3-digit SIC code from the Compustat universe during the subject years; Panel B presents data for firms subject to hedge fund activism events between the years 1995 and 2007. See Appendix A for definitions of all variables.

Table 3 presents summary statistics for executive characteristics for matched firms (Panel A) and target firms (Panel B). On average for matched firms (target firms), 15.5% (15.4%) of the sample are CEOs and 4.7% (6.4%) are female; top executive tenure is 10.7 years (10.0 years), CEO pay slice is 36.6% (36.9%), and total executive compensation is \$1.91 million (\$1.79 million). For CEOs only, 1.1%

(4.0%) of the sample is female, and tenure is 17.0 years (15.9 years). Total compensation is \$3.9 million (\$3.7 million). For other NEOs, 5.4% (6.8%) of the sample is female, and tenure is 9.5 years (8.9 years). Total compensation is \$3.9 million (\$3.7 million).

For the regression analyses in Tables 4 to 6, the general specification is:

Table 4. Target Firm Performance Before and After Hedge Fund Activism (1993 to 2009)

This table presents changes in measures of target firm performance in the years before and after being targeted by activist hedge funds. Dummy variables are as indicated. All regressions control for industry (3 digit SIC) and year fixed effects. The dependent variables in the separate regressions are: ROA = EBITDA/prior year total assets, q = (book value of debt + market value of equity)/(book value of debt + book value of equity), dividend yield = (total dividend payments during the year + total expenditures on share repurchases)/market value of equity, leverage = book value of debt/(book value of debt + book value of equity), cash flow ratio = cash flow/total assets, CEO turnover equals 1 if the CEO changes from the previous year, CEO pay equals TDC1 from Compustat, and pay for performance is equity based pay (stock and options) scaled by TDC1. Observations are from a matched sample (5 firms) based on 3 digit SIC code, market to book ratio, and firm size based on market value of equity. Cluster-robust cluster standard errors are in parentheses with clustering at firm level. ***, **, * indicate significance level at 1%, 5% and 10% level respectively.

Variable	ROA	q	Dividend Yield	Leverage	Cash Flow Ratio	CEO Turnover	CEO Pay	Pay for Performance
dummy=1 if event is 2 years future (t-2)	0.0245***	-0.2725***	0.0016	0.0084	0.0211***	-0.0137	-0.2493	-0.0137
	(0.0059)	(0.0661)	(0.0017)	(0.0108)	(0.0074)	(0.0220)	(0.2265)	(0.0209)
dummy=1 if event is 1 year future (t-1)	0.0098*	-0.4526***	0.0046**	0.0134	0.0265***	0.0200	-0.1734	0.0198
	(0.0057)	(0.0555)	(0.0018)	(0.0105)	(0.0074)	(0.0224)	(0.2344)	(0.0218)
dummy=1 if event occurs in year of observation (t)	-0.0028	-0.3395***	0.0072***	0.0228**	0.0079	0.0244	-0.1494	0.0036
	(0.0058)	(0.0685)	(0.0020)	(0.0106)	(0.0073)	(0.0236)	(0.2283)	(0.0241)
dummy=1 if event was 1 year ago (t+1)	-0.0054	-0.2769***	0.0084***	0.0351***	0.0044	0.0800***	0.3057	0.0023
	(0.0062)	(0.0660)	(0.0025)	(0.0117)	(0.0085)	(0.0278)	(0.2543)	(0.0240)
dummy=1 if event was 2 years ago (t+2)	0.0052	-0.2341***	-0.0023	0.0373***	0.0130	0.0442*	0.2255	0.0421*
	(0.0070)	(0.0751)	(0.0022)	(0.0139)	(0.0087)	(0.0260)	(0.2447)	(0.0250)
Constant	0.1077***	2.3875***	0.0452***	0.3527***	0.0506***	-0.1085***	12.1632***	0.0164
	(0.0142)	(0.1094)	(.01832)	(0.0536)	(0.0123)	(0.0398)	(0.6182)	(0.0498)
Year fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Industry fixed effects (2 digit SIC code)	Y	Y	Y	Y	Y	Y	Y	Y
Coefficients (t+1)-(t-1)	-0.0152	0.1757	0.0038	0.0217	-0.0221	0.0600	0.4791	-0.0175
Test of H0: Coefficients (t+1)-(t-1)=0 i.e. the same	Different**	Different**	Same	Different**	Different**	Different*	Different*	Same
F- Score	5.89	6.12	1.64	3.70	5.24	2.80	2.79	0.37
Prob > F	0.0153	0.0134	0.2006	0.0544	0.0221	0.0945	0.0952	0.5436
Coefficients (t+2)-(t-1)	-0.0046	0.2185	-0.0069	0.0239	-0.0135	0.0242	0.3989	0.0223
Test of H0: Coefficients (t+2)-(t-1)=0 i.e. the same	Same	Different***	Different**	Different*	Same	Same	Same	Same
F- Score	0.41	9.09	6.53	2.88	1.71	0.48	2.01	0.47
Prob > F	0.5233	0.0026	0.0106	0.0895	0.1915	0.4891	0.1569	0.4954
Observations	20,365	20,913	20,411	20,939	21,017	5,231	5,179	5,164
R-squared	0.187	0.148	0.149	0.200	0.094	0.062	0.208	0.097

Note: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

$$y_{i,t} = \sum_{j=-2}^{+2} \alpha_j + \sum_{j=-2}^{+2} \beta_j D_{i,j} + FE_{3digitSIC} + FE_{year} + \varepsilon_{i,t} \quad (7)$$

where $y_{i,t}$ is the firm or executive characteristic of interest for firm i in year t , $D_{i,j}$ is an indicator variable equal to 1 if firm i will be (was) subject to a hedge fund SEC 13D filing $-j$ years relative to the current year, $FE_{3digitSIC}$ and FE_{year} control for

industry (based on 3 digit SIC code) and year fixed effects, and $\varepsilon_{i,t}$ is an error term. The β_j coefficients represent the abnormal level of the characteristic of interest at target firms compared to normal levels at matched firms in the relative year indicated by j .

Table 5. Target Firm CEO Compensation Measures Before and After Hedge Fund Activism (1993 to 2009)

<i>Variable</i>	<i>CPS</i>	<i>Delta</i>	<i>Vega</i>
dummy=1 if event is 2 years future (t-2)	-0.005 (0.0071)	-0.0461** (0.0213)	-0.0376*** (0.0132)
dummy=1 if event is 1 year future (t-1)	-0.005 (0.0077)	-0.1249*** (0.0214)	-0.0593*** (0.0136)
dummy=1 if event occurs in year of observation (t)	0.0027 (0.0075)	-0.0814*** (0.0278)	-0.0489*** (0.0145)
dummy=1 if event was 1 year ago (t+1)	0.0064 (0.0077)	-0.027 (0.0311)	-0.0397** (0.0177)
dummy=1 if event was 2 years ago (t+2)	0.0114 (0.0079)	0.0145 (0.0365)	-0.0361 (0.0225)
Constant	0.2992*** (0.0061)	-0.6978*** (0.0245)	-0.5354*** (0.0151)
Year fixed effects	Y	Y	Y
Industry fixed effects (3 digit SIC code)	Y	Y	Y
Coefficients (t+1)-(t-1)	0.0114	0.0979	0.0196
Test of H0: Coefficients (t+1)-(t-1)=0 i.e. the same	Same	Different**	Same
F- Score	0.76	3.97	0.01
Prob > F	0.3843	0.0466	0.9238
Coefficients (t+2)-(t-1)	0.0164	0.1394	0.0232
Test of H0: Coefficients (t+2)-(t-1)=0 i.e. the same	Same	Different**	Same
F- Score	1.46	5.93	0.37
Prob > F	0.2266	0.0151	0.5438
Observations	11,283	8,773	8,773
R-squared	0.105	0.196	0.235

Notes: Robust standard errors in brackets

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

This table presents changes in measures of CEO compensation and wealth in the years before and after being targeted by activist hedge funds. Dummy variables are as indicated. All regressions control for industry (3 digit SIC) and year fixed effects and firm size based on the natural logarithm of target firm market value of equity. The dependent variables in the separate regressions are: CPS (CEO pay slice) is the CEO total compensation (Compustat TDC1) divided by the sum of total compensation (TDC1) for the top five highest paid executives at the target firm. Delta is the sensitivity of the CEOs option portfolio value to changes in stock price (i.e. the change in option portfolio value for a 1% change in the stock price). Vega is the sensitivity of the CEOs option portfolio value to changes in stock price volatility (i.e. the change in option portfolio value for a 0.01 change in the annualized standard deviation of stock returns). Observations are from a matched sample (5 firms) based on 3 digit SIC code, market to book ration, and firm size based on market value of equity. Cluster-robust cluster standard errors are in parentheses with clustering at firm level. ***, **, * indicate significance level at 1%, 5% and 10% level respectively.

First, I examine representative changes that take place at a firm when it becomes a target of an activist hedge fund. Table 4 provides insight into the impact of hedge fund activism on firm performance (ROA, q, and cash flow), capital structure (leverage and dividend & share repurchase yield), and governance (CEO turnover, compensation, and pay-for-performance). Separate indicator variables indicate if the event occurred within +/- two years of the year of the observation. All regressions control

for industry (3 digit SIC code) and year fixed effects and are based on a matched sample. The dependent variables in the separate regressions are ROA, q, and cash flow, leverage, dividend & share repurchase yield, CEO turnover, compensation, and pay-for-performance. The regression (1) results are for ROA, and the significant positive dummy coefficients in the two years prior to the event indicate that target firms have higher operating profitability than comparable non-targets. The column (1) results

show the same pattern as Brav, Jiang, Kim (2009) — a temporary drop in ROA following the activism event. The significant, negative indicator variable coefficients (all five at a 1% significance level) in regression (2) confirm that, compared to non-targets, target firms are undervalued and offer more growth opportunities. There is significant improvement in q after the activism event — I reject null hypotheses that the dummy coefficients in the years following the event are the same as the coefficient in the year prior to the event. The improvement in q is economically significant and supports the view that activist hedge funds enact change focused on creating wealth by improving the long-term performance of the target company. The results from column (3) indicate that the target firms have significantly higher payouts (measured by the total of dividend payments and share repurchases) in the three years surrounding the event. However, dividend and share repurchase yield is significantly lower in year $t+2$ than in year $t-1$. Regression (4) results provide evidence that that activism is associated with change in the target firm capital structure. Leverage at target firms in the years prior to the event is not significantly different than at matched non-targets. However, beginning in the event year, leverage at target firms increases and becomes significantly higher in the two years following the event compared to the year prior to the event. I reject null hypotheses that the dummy coefficients in the years following the event are the same as the coefficient in the year prior to the event. In the regression (5) results for cash flow ratio, the significant positive dummy coefficients indicate that target firms have higher cash flows than matched firms in the two years prior to the activism event. Cash flows decrease significantly in the year immediately following the activism event. In summary, prior to activism campaigns, target firms on average have higher operating profitability and cash flows and are undervalued compared to non-targets. They experience a temporary decrease in cash flows and operating profitability coincident with the activism event. Hedge fund activism appears to lead to increases in leverage and improvement in value (as measured by q). Overall, the results oppose the argument that activist hedge funds are short-term focused. For example, the temporary decrease in ROA and subsequent decrease in dividend payout are not consistent with short-term focused share price manipulation. Instead, the results are supportive of value creation by hedge funds. For example, the sustained increase in q is consistent with the activist hedge fund agenda focusing on growth opportunities. Hedge funds appear to behave in a responsible manner by responding to temporary decreases in cash flow and return on assets with subsequent reductions in dividend payouts and share repurchases.

I next examine what happens to executive compensation at target firms. Since the hedge fund is largely dependent on the target firm executive team, and particularly the CEO, to implement strategies to achieve the hedge fund's desired results, observable target firm characteristics related to the top executive could change as a result of the targeting (columns 6-8 in Table 4). Regarding CEO turnover, the results show two things: a) *compared to matched firms*, CEO turnover at target companies

is significantly higher in the two years following a hedge fund activism event, and b) *comparing year $t+1$ to year $t-1$* , CEO turnover at target firms is significantly higher in the year following the event than in the year preceding. The results in column (7) show that total CEO pay increases significantly in the year following the hedge fund activism event, compared to the year prior, supported by the column (8) result that shows that, in year $t+1$, pay for performance at target firms is significantly higher than at matched firms.

The U.S. Securities and Exchange Commission (SEC) defines named officers as CEO, CFO (chief financial officer), and the other top three highest paid officers of the company, and requires publicly traded companies to disclose compensation for named officers in annual proxy statements. I am interested in determining whether compensation changes at the executive level of the targets provide insight into the long-term or short-term nature of hedge fund activism. In order to test the change in risk taking incentives, I examine the delta and vega of executive compensation (Core and Guay, 2002). Using their methodology to estimate the size of the executive's option portfolio and the associated sensitivity of that portfolio to changes in stock price and stock price volatility, I calculated delta and vega by executive and year. Delta is the change in option portfolio value for a 1% change in the stock price. Vega is the change in option portfolio value for a 0.01 change in the annualized standard deviation of stock returns. Therefore, I can use levels and changes in delta to better understand how the presence of the activist hedge funds motivates the executive to take action to drive increases in share price, and I can use levels and changes in vega to assess the impact of activist hedge funds on the willingness of executives at the target firm implement risky projects. To evaluate if activist hedge funds have a preference for a certain type of target firm CEO, I examine the CEO pay slice, CPS (Bebchuk, Martijn Cremers, & Peyer, 2011). CEO pay slice is CEO total compensation (COMPUSTAT variable TDC1) divided by the sum of total compensation (TDC1) for the top five highest paid executives at the target firm. Since more powerful CEOs typically take a higher CEO pay slice, I am interested in whether or not CEO power is influential in the hedge fund's targeting decision. Table 5 presents results for target firm CEO's compensation measures before and after hedge fund activism. I find that the CEO pay slice at target firms is not significantly different than at comparable non-target firms; further, the CPS at target firms does not change significantly after the hedge fund activism event. I interpret this result to indicate that relative CEO power is not an important factor in activist hedge fund targeting. Prior to the activism event, the target company CEO's option portfolio sensitivity to changes in stock price is significantly less than that of comparable non-target companies. In the two years following the event, the CEO's sensitivity increases at the 5% statistical significance level. Economically, compared to the year prior to the activism event, for year $t+1$ the difference in the change of the CEO's option portfolio is \$82,500 for every percent change in share price of the target firm, and for year $t+2$ the difference in the change in option portfolio value is \$112,200 for every percent

change in share price. The target company CEO's option portfolio sensitivity to changes in stock price volatility is significantly less than that of a comparable non-target company both before and after the event — there is no significant change in

the CEO option portfolio's vega. Combined, the results indicate that the CEO has strong economic motivation to improve the share price of the target firm, but no significant motivation to assume additional risk for the firm.

Table 6. Target Firm Other NEO Compensation Measures Before and After Hedge Fund Activism (1993 to 2009)

<i>Variable</i>	<i>Delta</i>	<i>Vega</i>
dummy=1 if event is 2 years future (t-2)	-0.0749*** (0.0215)	-0.0645*** (0.0142)
dummy=1 if event is 1 year future (t-1)	-0.1444*** (0.0231)	-0.0789*** (0.0150)
dummy=1 if event occurs in year of observation (t)	-0.1240*** (0.0277)	-0.0898*** (0.0145)
dummy=1 if event was 1 year ago (t+1)	-0.0878*** (0.0320)	-0.0838*** (0.0199)
dummy=1 if event was 2 years ago (t+2)	-0.0923** (0.0400)	-0.0877*** (0.0243)
Constant	0.2272*** (0.0214)	0.0996*** (0.0130)
Year fixed effects	Y	Y
Industry fixed effects (3 digit SIC code)	Y	Y
Coefficients (t+1)-(t-1)	0.0566	-0.0049
Test of H0: Coefficients (t+1)-(t-1)=0 i.e. the same	Different*	Same
F- Score	3.75	0.07
Prob > F	0.0531	0.7861
Coefficients (t+2)-(t-1)	0.0521	-0.0088
Test of H0: Coefficients (t+2)-(t-1)=0 i.e. the same	Same	Same
F- Score	1.49	0.14
Prob > F	0.2227	0.7098
Observations	40,012	40,012
R-squared	0.180	0.217

Notes: Robust standard errors in brackets

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

This table presents changes in measures of other NEO compensation and wealth in the years before and after being targeted by activist hedge funds. Dummy variables are as indicated. All regressions control for industry (3 digit SIC) and year fixed effects and firm size based on the natural logarithm of target firm market value of equity. The dependent variables in the separate regressions are: Delta is the sensitivity of the executive's option portfolio value to changes in stock price (i.e. the change in option portfolio value for a 1% change in the stock price). Vega is the sensitivity of the CEOs option portfolio value to changes in stock price volatility (i.e. the change in option portfolio value for a 0.01 change in the annualized standard deviation of stock returns). Observations are from a matched sample (5 firms) based on 3 digit SIC code, market to book ration, and firm size based on market value of equity. Cluster-robust cluster standard errors are in parentheses with clustering at firm level. ***, **, * indicate significance level at 1%, 5% and 10% level respectively.

Table 6 presents delta and vega results for the named executive officers other than CEO. For these executives, both delta and vega are significantly lower for target company executives than for non-target executives across the entire five-year event window. In the year following the event, the delta for other named executives increases at the 10% statistical significance level. Economically, compared to the year prior to the activism event, for year t+1 the difference in the change of the other NEO's option portfolio is \$56,300 for every percent change in share price of the target firm. There is no significant change in the other NEO's option portfolio's vega.

Overall, the Table 5 and 6 results indicate that target firm executives' wealth is more sensitive to changes in share price after hedge fund activism

events suggesting that the entire top executive team experiences changes to their compensation structure that provides incentive to take action to improve returns to shareholders. The top executives are rewarded for increases in firm value but not for increased risk taking.

4. CONCLUSIONS

I model hedge fund activism as a sequential decision process. Typical stages include passive investment, change through communication with the board of directors and senior management, change through seeking representation on the board of directors without a proxy contest or management confrontation, change through formal shareholder proposals or public letters, change through the

threat of a lawsuit or proxy fight, change through proxy contests to replace the board of directors, change through proceeding with a lawsuit against the target, and change through takeover bid.

Activist hedge funds target undervalued or underperforming firms with high profitability and cash flows. The market responds positively to the arrival of activist hedge funds at target firms; q increases statistically and economically significantly in the two years following the activism event. Leverage increases statistically and economically significantly following the activist hedge fund taking an ownership stake and remains at high levels. Target firms respond to temporary decreases in return on assets and free cash flow by reducing dividend payments and share repurchases. These findings are consistent with an activist environment in which expected improvement in long-term firm performance causes target firm share price to increase.

Activist hedge funds do not avoid targeting firms with powerful CEOs. Target firm CEOs' pay for performance increases after the hedge fund activism event. The results indicate that the CEO has strong economic motivation to improve the share price of the target firm, but no significant motivation to assume additional risk for the firm. Overall, the results from the delta and vega regressions show that the wealth of target firm top executives wealth is more sensitive to changes in share price after hedge fund activism events — from a governance perspective, post-activism changes to executive compensation and wealth align the interests of shareholders and executives by providing incentive to take action to improve returns to shareholders without increasing risk.

The global hedge fund industry resumed rapid growth after a brief pause during the financial crisis of 2008-09. There is a gap in the literature regarding the impact of the crisis on the effectiveness of hedge fund activists' strategies and tactics and the ongoing relationship between activist hedge funds and target firm executive compensation and wealth. One opportunity for further research is to extend the data set to include the downturn of 2008-09 and subsequent recovery. Another avenue for future research is to use the general theoretical model to develop empirical tests. The possibilities are broad. For example, the probability of a successful outcome and the stage costs may be functions of ownership concentration, institutional ownership, and the investment time horizon of the institutional owners.

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Appendix A: Definition of Variables

Variable Name	Variable Definition
<i>Firm-Level Variables</i>	
Dividend and Share Repurchase Yield	total dividend payment and total expenditures on share repurchases all divided by market value of equity
Free Cash Flow	net income plus depreciation & amortization plus interest after tax minus the increase in net working capital minus capital expenditures
Free Cash Flow Ratio	free cash flow divided by total assets
Leverage	book value of debt divided by sum of book value of debt and book value of equity
Market to Book Ratio	fiscal year end share price times common shares outstanding divided by book value of equity
Market Value	sum of market value of equity and book value of debt
Market Value of Equity	share price at fiscal year-end times the total number of shares outstanding
q	sum of book value of debt and market value of equity all divided by the sum of book value of debt and book value of equity
Research and Development (R&D)	research and development expense divided by prior year total assets
Return on Assets (ROA)	earnings before interest, taxes, depreciation, and amortization (EBITDA) divided by prior year total assets
Sales Growth	increase in sales over prior year divided by prior year sales
Stock Return	fiscal year end price plus all per share dividend payments during the fiscal year all divided by prior fiscal year end share price
Variable Name	Variable Definition
<i>Executive-Level Variables</i>	
CEO	indicator variable equal to 1 if the executive is CEO
CEO Pay	Compustat variable TDC1
CEO Pay Slice	CEO total compensation divided by the sum of total compensation for the top five highest paid executives at a firm
CEO Turnover	indicator variable equal to 1 if CEO changes from previous year
Delta	the change in option portfolio value for a 1% change in the stock price
Pay for Performance	equity based pay (stock and options) scaled by TDC1
Tenure	number of years that the executive has worked at the firm
Total Compensation	Compustat variable TDC1
Vega	the change in option portfolio value for a 0.01 change in the annualized standard deviation of stock returns