

Hedge Fund Activism and CEO Compensation*

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Monday 25th September, 2017

Abstract

Applying a difference-in-differences approach, we document the effect of hedge fund activism on the corporate governance of target firms via the specific channel of CEO compensation. We hand-collect data on managerial pay, for a sample of 244 U.S. publicly-listed firms that were targets of activist hedge funds from 2009 to 2011, and their corresponding 244 industry, size and book-to-market matched firms. We find that target CEOs receive higher stock and total compensation, as compared to their peers, prior to an activist's entry. The entry of hedge fund activists results in a decline in target CEO pay, to levels prevalent at matched firms. This decrease is not because target CEOs were extracting rents before activism, since CEO pay at target firms, prior to activism, was indeed sensitive to firm performance. Instead, we show that the entry of hedge fund activists results in a decline in not just the level, but also the pay-for-performance sensitivity of CEO stock awards and total pay at target firms. These findings indicate that incentive compensation and monitoring by activist hedge funds, act as substitutes in motivating CEOs to improve firm value.

JEL: G23, G34

Keywords: Hedge fund activism, executive compensation, corporate governance, managerial incentives

*We are grateful to Alon Brav for access to his activist data set. We have benefited from the comments and suggestions of April Klein, Praveen Kumar, Pedro Matos and John Thanassoulis. We would also like to thank seminar participants at Warwick Business School and the FMA European Doctoral Consortium for their useful feedback.

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1 Introduction

Hedge fund activists receive wide-spread attention in the business press for their public criticism of target firm governance and costly proxy fights (Vardi, 2014). Hedge fund managers acquire large stake positions in a handful of publicly listed companies, and campaign more freely for changes in various aspects of the target firms' governance, as compared to other traditional institutional shareholders like mutual and pension funds (Gillan and Starks, 2007). Hedge funds are exempt from regulatory barriers that restrict investment concentration, and have high pay-for-performance incentives for their managers, which enables their activism.¹ The literature shows that activist hedge funds improve payout, operating performance and corporate governance of their target firms, with an aim to increase the value of their own portfolio and earn significant return (Brav et al., 2008; Klein and Zur, 2009).² In order to implement these changes, hedge fund activists align the interests of target firm management with their own value-maximizing objective. However, the impact of activism on managerial incentives to improve target firm value is currently under-explored.

In this paper, we fill the gap in the literature and provide evidence on how hedge fund activism influences the compensation package of target CEOs. Anecdotal evidence suggests that hedge fund managers, with an overall goal of significant target performance improvement, tend to oppose excessive managerial pay, and often advocate the use of pay packages that are performance sensitive (Goldstein, 2015; Smith, 1996). Univariate findings of Brav et al. (2008) also indicate that hedge funds curtail executive compensation and improve pay-for-performance sensitivity. Therefore, our prior is that hedge fund activism reduces the fixed base salary and overall target CEO pay, increases performance oriented equity incentives, and enhances the sensitivity of compensation to firm performance.

To test this hypothesis, we hand-collect data on CEO compensation for 244 U.S. publicly listed firms that were targeted by hedge fund activists from 2009 to 2011 and their corresponding 244 industry, size and book-to-market matched firms, which serve as a control group. We gather the compensation data for 7 years – the year of activism, 3 years before and 3 years after activism – from proxy statements made publicly available on the EDGAR webpage of the US SEC. We are not able to gather compensation data for a representative sample from Compustat's ExecuComp, which is the typical source for compensation data in the literature, because hedge

¹See Appendix A for the institutional and regulatory background of hedge funds.

²Target firms, henceforth, will be used as a shorthand for firms that are targets of hedge fund activism.

fund targets are usually small firms.³ ExecuComp contains compensation data only on fairly large S&P 1500 companies, and relying solely on ExecuComp would impose a significant size bias. We start our compensation data collection from 2006 because option expensing was made mandatory by the FAS 123R regulation in 2006 (FASB, 2004a,b).⁴ This accounting treatment creates inconsistencies in data collection, and also led to a decline in popularity for option awards (Frydman and Jenter, 2010; Damodaran, 2005). Moreover, we are able to exploit the enhanced disclosure requirements introduced by SEC amendments in 2006, which were aimed at increasing transparency in executive compensation reporting (SEC, 2006; Grinstein et al., 2015).

We find that target firm CEO compensation indeed changes after activism. Our results show that target firms pay their CEOs \$353 thousand more than their matched counterparts, in the year of activists' entry. One year after activism, this difference disappears. This evidence is consistent with our prior that activist hedge funds reduce excess overall CEO pay. We further partition CEO pay into individual components such as the base salary and stock awards. The fixed base salary for target firm CEOs is not significantly different from matched firms before activism, but becomes significantly smaller by \$41 thousand, two years after activism. In the year of activism, target firm CEOs receive \$321 thousand more than their peers in terms of stock incentives such as restricted stock and restricted stock units, and this difference is statistically significant at the 1% level. One year after activists' entry, stock incentives awarded to target CEOs are not different from their matched equivalents. This result for stock compensation contradicts our prior, that activists target weak corporate governance firms with poorly designed compensation packages and push for performance-related pay.

We have two possible explanations for this surprising result. First, stock awards are not truly fulfilling their role as incentive compensation, but are rather used to over-compensate CEOs. Although companies assert that stock compensation is performance based, many incentive plans act to enrich the CEOs without sufficient returns to firms (Barris, 1992). The second alternative reasoning is that stock compensation is based on firm performance, and in the absence of activism, stock awards provide a significant incentive to CEOs to improve firm value. Activism targets do not have any deficiencies in this respect. However, compensation which is related to firm performance is expensive, because it exposes risk-averse managers to too much volatility

³Hedge funds have to forgo a substantial amount of capital to acquire a meaningful stake in a large firm, and usually target smaller firms (Brav et al., 2008; Klein and Zur, 2009; Greenwood and Schor, 2009).

⁴See Appendix B for an explanation of the FAS 123R regulation.

in their pay, who would in turn want to be compensated for the risk and ask for more pay (Frydman and Jenter, 2010; Murphy, 2013). Once activists enter a target firm, they decrease stock compensation because they monitor target firm management anyway, so they do not need to motivate managers through costly incentive compensation.

To reconcile the stock pay puzzle, we further investigate if performance-oriented pay such as stock awards are in reality sensitive to firm performance. Our results show that the sensitivity of CEO stock and total compensation to past firm performance is significantly higher for target firms, relative to their peers before activism, but becomes insignificant one year after activism. Thus, we show that stock awards are indeed commensurate to target firm performance before activism, and are not used to over-compensate the CEO. The decrease in pay-for-performance sensitivity after activism is a rather surprising result. We conjecture that this decrease reflects monitoring by activist hedge funds, which substitutes for incentive-laden compensation (Hartzell, 1998; Fahlenbrach, 2009; Mehran, 1995). This explanation, for the decrease in pay-for-performance sensitivity after activist entry, is in line with the fact that activists guide and assist target CEOs in improving firm value, which diminishes the need for CEO compensation to be made highly sensitive to firm performance at an extra cost (Edmans et al., 2017).

Activists can assist CEOs by getting involved in decision making, and engaging with target firm management. Anecdotal evidence does suggest that some hedge fund activists follow ‘constructivism’, aiming to collaborate with management via private communication such as letters, meeting and informal proposals (AIMA, 2015). For example, an article by (Kerr, 2008) notes that activist Cevian Capital, “has an informed and prepared approach to discussion with incumbent management which opens the way up to constructive dialogue, rather than antipathy”. Activist Blue Harbour Group states that, “We believe in a private equity approach to investing: buy in and then help management make changes” (Benoit, 2013). Our findings also show that three years after activism, around the time when the activists usually exit (Brav et al., 2008), total and stock compensation in target firms is again more sensitive to firm performance as compared to matched firms. This result ascribes to the renewed need for CEO compensation to fill the void left by activists.

After an activists’ entry, the pay-for-performance sensitivity of base salary, employee stock options and other compensation is also significantly lower for target firm CEOs relative to their peers. Given that the rate of CEO turnover is significantly high at 13.5% in target firms one year after activism, we also control for CEO turnover. Our results are robust and are not

spuriously driven by firms hiring a new lower paid CEO.

While the academic literature documents the impact of hedge fund activism with regards to firm value (Brav et al., 2008; Klein and Zur, 2009), bondholders (Klein and Zur, 2011), mergers (Greenwood and Schor, 2009; Boyson et al., 2016) and product market spillovers (Aslan and Kumar, 2016); the analysis on activism’s impact on CEO pay, an important internal corporate governance mechanism (Denis and McConnell, 2003), is not thorough and conclusive in the literature at the moment. Corporate law articles within The Harvard Law School forum on corporate governance, contain some anecdotal evidence on executive compensation of hedge fund activism targets, but do not provide any empirical analysis (Goldstein, 2015; Lipton, 2015). Brav et al. (2008) discuss executive compensation as a part of their analysis on hedge fund activism’s impact on corporate governance, but very briefly and with limited data. We attribute this limited analysis on compensation data to the large-firm-bias in the data provided by ExecuComp.⁵

By hand-collecting data, we avoid this bias towards large companies, and present a thorough analysis of CEO pay changes in hedge fund activism targets which are mostly smaller firms. We also provide a detailed analysis by using granular data on individual components of CEO pay packages, comprising of a fixed base salary, short-term performance oriented bonuses, and long-term incentives such as stock and option grants. To the best of our knowledge, this study is the first to analyze an important, yet poorly explored, corporate governance impact of hedge fund activism – that of target firm CEO compensation.

Large institutional shareholders can overcome the free riding problem that arises in monitoring of management by widely-dispersed shareholders (Jensen and Meckling, 1976; Shleifer and Vishny, 1986; Grossman and Hart, 1980). Institutional shareholder activism in the United States, in the late 1980s and 1990s, was dominated by traditional shareholders like pension funds and mutual funds. Hartzell and Starks (2003) analyze mutual and pension funds to find that the ownership accounted for by the top five institutional investors is negatively related to the level of executive compensation, and positively to the pay for performance sensitivity of compensation. However, it is imperative to analyze target firm executive compensation from a separate lens in the instance of hedge fund activism, relative to traditional institutional shareholder activists, because hedge funds are exempt from regulatory barriers and differently organized.⁶ Legal rules

⁵To confirm this bias, we cross reference our list of hedge fund targets, with the data available on ExecuComp and find that only approximately 20% of hedge fund targets are covered in ExecuComp.

⁶Compensation related shareholder activism can also include shareholder proposals on pay and vote-no cam-

and agency costs faced by the traditional institutional shareholders lead to trivial monitoring on their part, which is not very effective in improving target firm performance (Black, 1998).⁷

Our result that the entry of hedge fund activists reduces pay-for-performance sensitivity is indeed suggestive of an alternative approach taken by hedge fund activists, relative to other traditional shareholder activists in monitoring firm management. In our study, alternative corporate governance mechanisms, more specifically incentive compensation and activist hedge funds act as substitutes in providing managerial incentives, in a principal-agent paradigm. This finding is in contrast to studies in which trivial monitoring by mutual and pension funds, and executive compensation act as complements, functioning in concert to alleviate management-shareholder agency problems (Hartzell and Starks, 2003; Almazan et al., 2005; Chidambaran and John, 1998).

This paper extends the already well established literature on managerial incentives and the policy debate on CEO pay. In showing that CEO pay is sensitive to firm performance, our findings render more support to the argument that the CEO pay package is an outcome of optimal contracting in a competitive environment, as opposed to the result of rent extraction by powerful managers (Frydman and Jenter, 2010; Murphy, 2013).

The rest of the paper is organized as follows. We describe the data and present descriptive statistics in Section 2. Section 3 discusses the research design and provides the main regression results. Section 4 concludes.

2 Data

The approach followed in the literature to identify activism events in the US is to refer to Schedule 13D filings, that hedge funds file with the SEC when they acquire 5% or more of beneficial ownership of a target firm, with an intention to influence control (Brav et al., 2008; Klein and Zur, 2009). Item 2 of this form states the identity and background of the person lodging the statement. Our activism data is from Alon Brav (Brav et al., 2013), and contains a list of hedge fund activism events from 1994 to 2011, with the hedge fund name, target firm

paigns, that target compensation committee members or excessive CEO pay (Ertimur et al., 2011). But as a low-cost activism mechanism, these proposals function differently from the costly and large-ownership based hedge fund activism.

⁷The Investment Company Act, 1940 imposes trading restrictions on investment companies (for example, mutual funds) such as short-selling of shares and disclosure of investment policy. There are also Financial Industry Regulatory Authority Inc. (FINRA) limits on types of fees that investment companies can charge.

name and the date on which the 13D filing was made.⁸

From this list, we only consider activism events for publicly listed target firms, since private firms' accounting and compensation data is barely available. We also require activism to have started no sooner than 2009, because of two restrictions that we impose on our compensation data collection. Firstly, we collect CEO compensation data for 7 years, which covers 3 years before the hedge fund activism year, the activism year itself and 3 years after activism. We are primarily interested in analyzing changes in compensation brought about by hedge fund activism, and this boundary is useful to establish a 'pre-post activism benchmark'.

Secondly, we start our compensation data collection from 2006 because of the implementation of the Revised Financial Accounting Standards No.123 (FAS 123R), related to share-based payments in 2006. FAS 123R introduced changes in expensing of employee stock options (ESOs) which is an important component of executive compensation (FASB, 2004a,b). Prior to 2006, most firms do not report any stock option compensation cost. After the change in regulation in 2006, stock option costs are reported and recorded as an expense for all firms.⁹ This change in regulation affects reporting of ESOs by companies and creates inconsistencies in data collection before 2006.¹⁰ Additionally, not expensing options before 2006, creates a bias in favour of stock options and against other stock and cash based incentives. This popularity of option grants stemmed from perceived costs of options being substantially lower than economic costs (Hall and Murphy, 2003). By analyzing compensation after 2006, we are able to avoid this bias and analyze stock based compensation in a fair manner. Also, effective December 2006, the SEC introduced enhanced disclosure requirements on executive compensation, which provide a more cohesive report of managerial pay (SEC, 2006). These disclosure rules incorporate the option expensing changes, require a tabular display of every sub-component of pay, and create uniformity across firms, thereby making hand-collection more straightforward.

Applying this post-2009 filter to the initial list of 2684 activism events, we are left with 463 activist events involving 170 hedge funds/hedge fund groups that target 412 firms, over a 3-year period from 2009 to 2011.¹¹ The earliest data we have on compensation is from 2006 (3 years

⁸Note that hedge funds can acquire a less than 5% stake in very large firms and still engage in activism, however, identification of these events is not possible via a 13D filing.

⁹We conducted a pilot search of compensation data for several firms, which showed that prior to 2006 most firms do not report any monetary expense related to ESOs. They simply report the number of shares underlying the option and not enough terms required to compute the option value. However, after 2006, firms awarding ESOs, report as a monetary expense the option value, calculated according to an option valuation model.

¹⁰See Appendix B for a detailed explanation.

¹¹Multiple hedge funds can target the same firm.

before 2009) and our latest data is from 2014 (3 years after 2011, the last activism date). As a consequence the compensation data is over 2006 to 2014.

We exclude instances of merger arbitrage from our sample, since their motive and consequence is different from that of shareholder activism (Brav et al., 2008; Boyson et al., 2016). We gather data on mergers and acquisitions (M&As) over 2008 to 2013, from Thomson One Banker’s Deals Analysis module. Cross-checking the M&A data with the hedge fund activism data, we find 63 events involving 52 target firms where a hedge fund intervenes in the target firm after the announcement of a merger. As a result of dropping these target firms, our final activism-compensation sample consists of 400 activism events for 360 targets and 150 hedge funds.

For a meaningful analysis, we need to additionally compare the target firms to other firms that were not targets of hedge fund activism. By solely comparing changes in target firm CEO compensation before and after activism, we cannot establish that these changes are infact caused by activism. We risk introducing biases in our interpretation as we could merely be capturing a time trend. Thus, we construct a control sample, by finding industry, size and book-to-market matched firms, that are not targeted by activist hedge funds, for each of our target firms in the year of activism.¹² More specifically, we use the following algorithm: First, for each activism target, we find corresponding industry peers, in the year of activism, from the Hoberg-Phillips TNIC3 database (Hoberg and Phillips, 2010, 2016).¹³ Second, for our target firms and each of their TNIC3 peers, we obtain their market value of equity (ME) and the book-to-market (BM) ratio as of activism fiscal year-end, by using firm level data from Compustat.¹⁴ We rank all firms (including the target firm) across their ME and BM values separately, and scale the ranks by the number of peers in each TNIC group to come up with a value between 0 and 1. Following Jayaraman et al. (2015), we compute a pair-wise distance score using the ME and BM scaled

¹²Brav et al. (2008) and Ertimur et al. (2011) also create a control group based on these criteria but on a year-to-year basis. Our matching is done just for the event year, since we want to compare the evolution of pay in the target to a single matched firm, pre- and post-event.

¹³The TNIC or Text-Based Network Industries database provides a pairwise similarity score for every pair of firms, by parsing text-based product descriptions from a firm’s annual 10K filing. The TNIC3 database is calibrated to be as granular as three-digit SIC codes. A higher score indicates a higher degree of similarity and firm pairs with a higher score are nearer rivals. See the Hoberg Phillips Data Library for more details on pairwise score construction: <http://hobergphillips.usc.edu/>

¹⁴ME is the market capitalization of a firm and BM is the ratio of book equity to market equity. Table 1 describes in detail how we construct these variables.

rank scores as follows:

$$\sqrt{(\text{ME scaled rank}_{Target} - \text{ME scaled rank}_{Peer})^2 + (\text{BM scaled rank}_{Target} - \text{BM scaled rank}_{Peer})^2}$$

Some of our target firms appear as peers for other target firms. We remove these firms from consideration as peers (after calculating the distance score), since we require that none of our matched firms be targets of hedge fund activism themselves. Finally, we select as our matched firm, the peer with the lowest distance score corresponding to the given target. Thus, we give equal weight to ME and BM in selecting a match for our target firms from our list of TNIC3 peers.¹⁵ Applying the above algorithm to our 360 target firms, we lose 54 target firms because they don't have ME and BM data on Compustat for the given activism year. Additionally, there are 62 target firms for which we don't find an industry peer from the TNIC3 database. This results in a final sample of 244 target firms and a corresponding control group of 244 firms. For these 488 firms we collect CEO compensation data for 7 years.

We hand-collect compensation data on target and control firm CEOs from the annual definitive proxy statements or the DEF 14A filings, that are publicly available on the SEC EDGAR webpage.¹⁶ Hand-collection is necessary because hedge fund targets are usually small firms that are not covered by ExecuComp. The annual DEF 14A is required by the SEC when an issuer is soliciting shareholder votes for a company's upcoming annual meeting.¹⁷ Companies must disclose information concerning the amount and type of compensation paid to its chief executive officer, chief financial officer and three other most highly compensated executive officers (termed Named Executive Officers or NEOs), for the last three completed fiscal years in the proxy statement (SEC, 2006, 2007).¹⁸ Our analysis focuses only on CEOs because we expect the impact of activism on other executive officers' compensation to be in the same direction as that of the CEO. We believe that activists are likely to rally for changes in compensation for the entire executive suite, rather than consider a different metric for executives lower-ranked than

¹⁵We also have instances where a given firm appears as a match (with the lowest distance score) for multiple targets. In such cases, we select a match by minimizing the combined distance of the first and second best target-peer combination.

¹⁶The webpage is free to access online at: <http://www.sec.gov/edgar/searchedgar/companysearch.html>

¹⁷Section 14 (a) of the Securities Exchange Act, 1934 requires that an issuer of securities must furnish to each shareholder a proxy statement, if the issuer is soliciting proxies or consents from shareholders. The definitive proxy statement must be filed with the SEC no later than the date they are first sent or given to shareholders. (Available at: <https://www.law.cornell.edu/cfr/text/17/240.14a-6>)

¹⁸Pursuant to Item 402 of Regulation S-K of the Securities Act, 1933 and the new enhanced disclosure rules of the SEC in 2006.

the CEO. Thus, looking at compensation changes after activism for the CEO alone suffices as a representation of senior management.

The proxy statement includes a Summary Compensation Table, which provides a comprehensive tabular overview of the company's total executive pay broken down into seven categories: dollar values of the salary, bonus and non-equity incentive plans, stock and option based awards, deferred compensation and other kinds of pay such as perquisites.¹⁹

For each of the firms in our sample, we collect data on both total and individual components of CEO compensation. The base salary represents a fixed cash-based payment. We take the annual cash bonus and non-equity plan-based compensation together to represent the bonus component. Stock awards include restricted stock, restricted stock units, phantom stock, phantom stock units, common stock equivalent units or other similar instruments that do not have option-like features (SEC, 2006), and are in terms of grant-date fair value. Option awards are reported as a compensation cost in terms of their fair market value at the time of grant. All other compensation includes any changes in pension value, non-qualified deferred earnings and any other compensation such as perquisites. Total compensation is calculated by adding all individual components of pay. Our measure of total compensation corresponds to the TDC1 measure in ExecuComp.

SEC reporting rules confound the distinction between grant-date and realized pay. Cash bonuses are reported when they are realized as commensurate to performance, while equity awards are reported at grant date fair values. Borrowing an example from Murphy (2013), consider a CEO that receives a bonus of \$10 million in January 2012 for performance in 2011, and that \$4 million is paid in cash and the remaining \$6 million in stock and options. According to SEC rules, the \$4 million cash bonus is reported as part of 2011 compensation, while the \$6 million bonus paid in the form of stock and options is reported as part of 2012 compensation. In this case, the reported cash bonus in 2011 corresponds to firm performance in the same fiscal year 2011, while the equity bonus reported in 2012 corresponds to lagged firm performance in 2011.

We use the reported grant-date values of equity awards, instead of converting them to realized pay, since the compensation committee of the board, that evaluates the competitiveness of the CEO pay package at the beginning of the year, focuses on grant-date pay levels (Murphy,

¹⁹All our annual proxy statements are filed after January 2007, and are therefore subject to both the FAS 123R and the new SEC disclosure rules.

2013), and any changes to CEO compensation comes via the board. The literature also uses grant-day values of stock awards (Frydman and Jenter, 2010; Murphy, 1985, 2013). Option grants are more meaningful for our study since they reflect the board of director’s decision as opposed to option exercises over which the board has limited control (Ofek and Yermack, 2000). Additionally, the value realized from option exercises have more to do with optimal managerial ownership dynamics rather than decisions of the board (Hartzell and Starks, 2003).

We gather accounting data on firm characteristics from Compustat. The number of compensation data-related observations drop each year as compared to our sample size of 244 target firms. This drop is because of missing annual proxy statements on the EDGAR database. Furthermore, we lose some compensation data for those target firms that undergo an M&A transaction after activism, because their CEO compensation data is not publicly available since target firms cease public listing upon the M&A deal completion date.²⁰ For each of our 244 target firms, CEO compensation is available for atleast one year.

2.1 Descriptive Statistics

Figure 1 depicts a timeline of the effect of hedge fund activism on CEO compensation. The ‘event year’ t_0 is the year in which the Schedule 13D is filed, and it signifies the start of hedge fund activism.²¹ Compensation awards, in general, are set just before the beginning of a fiscal year and are reported as of fiscal year end in the proxy statement.²² An activist entering a target firm in the middle of fiscal year t_0 , might not always be able to influence compensation awards that have already been set for t_0 . Also, activists may start with a general value maximizing intention and only switch to a more specific objective that impacts CEO pay, over a span of 1 to 3 months after the initial 13D filings.

Moreover, target firms might not immediately agree to the activists’ demands leading to a period of negotiations or hostility. This lag in implementation of the activists’ agenda can create a delay in the corresponding adjustment in CEO compensation. Hence, activists can not

²⁰We lose data for 4 firms because of a merger in the year of activism, 32 firms because of a merger one year after activism, and 8 firms for a merger two years after activism. Data is still available for some of the target firms that had mergers after activism, most likely because those deals were not yet complete during our sample period.

²¹Some of the target firms face activism from multiple hedge funds. For target firms which have more than one activism instance, we consider the activist hedge fund that first filed the 13D as the main activist and the corresponding activism date as t_0 .

²² t_0 is determined on a calendar year basis from the date of the 13D filing, where as the compensation associated with t_0 is recorded on a fiscal year basis. For example: A 13D filed on February 1, 2009 for a target firm with fiscal year 2009 ending on March 31, 2010 corresponds to $t_0 = 2009$, and compensation is recorded for fiscal year 2009.

only impact the compensation award that is to be paid in the year of activism t_0 , but also t_1 , one year after activism is announced. Appendix C discusses the timeline by using a specific example of the target firm Midas, Inc. Furthermore, it has been documented that the average holding period of activists is 22 months (Brav et al., 2008). Thus, it is likely that any influence of activism on compensation gets less effective after two years.

Table 1 defines all variables and provides information on their source of data. Table 2 lists the most popular activist hedge funds in our sample. Gamco Investors headed by Mario Gabelli leads with 20 instances of activism. Table 3 reports the average level of compensation earned by all target and matched firm CEOs in Panel A, and the median figures in Panel B. To account for outliers, we winsorize all compensation variables at the 1% and 99% levels. We test for differences in mean (median) CEO compensation between the target and matched firms using the t -test (Wilcoxon signed-rank test), and report significance in the matched firm columns.

Panel A of Table 3 shows the evolution of pay over time for the average target and matched firm CEO. The fixed base salary is at a fairly steady average level of approximately 0.5 million dollars throughout, for both the target and matched CEOs. The performance-based cash bonus on average remains significantly higher for the matched firm CEO over the years until t_1 , after which the difference becomes insignificant, although bonus increases on average after activism for target firm CEOs. Target CEO stock compensation on average is significantly higher than the matched firm CEO from t_{-2} to t_0 . This pattern indicates that target firms, in comparison to their matched peers, use more stock-based incentives vs. cash-based incentives before activism. Target CEO stock compensation decreases on average from t_0 to t_1 , whereas the average value of the stock awarded to the matched firm CEO increases over the same period. In t_2 , average stock compensation for the target firm CEO increases again and becomes significantly higher than the matched firm CEO. Option awards and other perquisites, on average, are not significantly different for the target firm CEOs, as compared to their matched counterparts over the years.

Target firm total CEO compensation is higher than its matched counterpart, on average, from t_{-2} to t_{-1} , in terms of economic magnitude but without statistical significance. But by t_1 , the average matched firm pays its CEO \$350,000 more than the CEO of a hedge fund target, in terms of economic magnitude. This observation confirms with Brav et al. (2008)'s univariate tests showing that activist hedge funds reduce total CEO compensation in target firms. From t_2 onwards, the target firm CEOs are again paid higher on average than their matched peers, and in t_3 this difference becomes approximately \$800,000 and is statistically significant. We witness

a steep rise in total compensation for the average target CEO from around \$2.6 million in t_1 to \$4.3 million in t_3 , which stems primarily from a sharp increase of \$0.7 million in stock awards over the same period. The rise in total compensation from t_1 to t_3 for the average matched firm CEO on the other hand is not as steep, increasing by approximately \$0.4 million.

Stock awarded to the CEO as a percentage of total compensation (and as a percentage of stock plus salary) is significantly higher on average for the target firm, than the matched firm before activism, but the difference is not significant after activism. Panel B of Table 3 reveals that CEO salary is higher than stock incentives at the median level (but lower at the mean level), for both target and matched firms, implying a bigger skew in the distribution of the latter. We also observe a lower median value of option grants, as compared to stock grants, in the years following t_0 . This decline in popularity for option awards can be explained by the introduction of the FAS 123R option expensing rule, which has caused a shift away from ESOs to restricted stock and restricted stock units (Frydman and Jenter, 2010; Damodaran, 2005). The difference between total pay for a median target and matched CEO is negligible. Similar to findings in the literature, compensation values are amplified when focusing on the average because of skewness in the distribution of compensation (Frydman and Jenter, 2010).

Panel A of Figure 2 plots the average stock compensation for target and matched firm CEOs. We see that before activism, both target and matched firm stock compensation shows an increasing trend on average. Thus, the data is in confirmation with the difference-in-differences parallel trend requirement. Post-activism, from t_0 onwards, matched firm stock compensation continues to increase. But the target firm stock compensation drops and then begins to rise post t_1 . A similar pattern holds for total compensation in Panel B. Total CEO pay at matched firms increases gradually from t_{-3} onwards. At target firms, total compensation initially increases till t_0 , then drops and rises again post t_1 .

In summary, our univariate findings provide an indication that target firm CEOs are on average paid higher than matched firms before activism, but after activism, their pay levels are not distinguishable. The data also suggests that stock awards are the main component of CEO pay affected by activism. Stock compensation for the target CEOs, as compared to the matched CEOs, is significantly higher before activism and the difference is not significant one year after activism. Two years after activism, target CEOs are again paid higher in stock than their matched analogue. This pattern evinces that the increase in firm value from activism, might lower the need to give the CEO incentives to improve firm value. Once the activist exits,

CEO stock compensation again plays a dominant role in achieving the shareholder objective of firm value improvement.

Table 4 reports the beneficial equity ownership of CEOs in terms of dollar values and as a percentage of shares outstanding. Ownership is a corporate governance device that helps to align interests between shareholders and managers, by incentivizing CEOs to improve firm performance (Lilienfeld-Toal and Ruenzi, 2014). Beneficial ownership includes shares underlying options and warrants that are currently exercisable or exercisable within 60 days after the measurement date, which is usually the record date. From Panel A, we see that average CEO ownership at matched firms in all years is substantial at about 6% of all outstanding shares. However, ownership of target firm CEOs is on average significantly lower than the matched firms CEOs over all the years, both in terms of absolute dollar values and as a percentage of outstanding shares, suggesting a need for more direct monitoring of target CEOs and/or giving them more incentives to increase firm value (Frydman and Jenter, 2010). The median figures in Panel B show the same pattern as the mean.

Table 5 investigates CEO turnover at target and matched firms, which is identified by checking if the name of the CEO changes from the one in the previous year. 13.5% of the target firms in our sample have had a change in the CEO from t_0 to t_1 . This high rate of CEO turnover confirms with the findings of Brav et al. (2008) who show that after the announcement of hedge fund activism, the CEO turnover rate at the target firm increases by 10 percentage points. Kaplan and Minton (2006) also find that CEO turnovers have become more frequent and higher in firms after 1998 as compared to previous periods. We note that matched firms show high CEO turnover over time, both before and after activism. The cumulative percentage of CEO turnover since hedge fund activism in t_3 is around 30% in both target and matched firms. In running our main regressions in the next section, we control for CEO turnover in years t_0 and t_1 , at both target and matched firms, as a robustness check.

We report summary statistics on target and matched firm characteristics in Table 6. From Panel A, we see that there is no significant difference between the average market value of equity (ME) for the target and matched firm, throughout the years except for t_0 , but only at the 15% level. The mean book-to-market (BM) ratio, also does not exhibit any significant differences between the target and matched firms, except at the 10% level in t_1 . This evidence lends support to our matching technique, in the sense that target and matched firms are indeed similar in terms of ME and BM. Following (Brav et al., 2008), we use return on assets (ROA)

defined as the ratio of EBITDA to lagged assets, as a measure of operating profitability. We see that on average, there are no significant differences between the target and matched firms in terms of ROA, indicating that target firms, though undervalued, are profitable and do not suffer from operational difficulties. The corresponding median figures in Panel B show a pattern similar to the average statistics.

3 Empirical Methodology and Results

We use an event study research design, combined with a difference-in-differences identification technique in a panel data framework, for our analysis. We aim to study the impact of hedge fund activism (our ‘event’ or ‘treatment’) on the compensation of target firms (our ‘treatment’ group) versus a set of industry, size and book-to-market matched firms that do not receive treatment (our ‘control’ group). Our target firms face activism (receive treatment) in three different calendar years – 2009, 2010, 2011, which we normalize as the event year, $t = 0$. Our objective is to estimate the ‘treatment effect’, i.e. the change in target firm compensation pre-activism ($t = -3, -2, -1$) and post-activism ($t = 1, 2, 3$), as compared to matched firms.

If we analyze changes in only target firm compensation pre- and post-event, our comparison is biased because any effect could simply be the result of trends. Even if we control for time-fixed effects, similar in spirit to Aslan and Kumar (2011) and Pagano et al. (1998), we still cannot establish causality, since any change in compensation could simply be happening because of some spurious correlation between compensation and activism, rather than changes in compensation being caused by activism. Again, simply comparing the target and matched firms post-activism is also biased, as any impact could be the result of permanent differences between the two groups.

In using a difference-in-differences estimation method, we remove both the over-time and across-groups biases (Imbens and Wooldridge, 2007). We wish to argue that activism has an impact on CEO pay. Hence, we need to be sure that some unobserved target firm feature is not causing CEO pay to change even without the presence of an activist. Therefore, if firms match in all observable ways at the time of activism, and yet the firms that activists pick are the ones which change pay, then this effect is likely to be causal.

We have a panel consisting of both target and match firms, with data on compensation over the years $t = -3$ to $t = 2$. We estimate the following two-way fixed effects regression speci-

fication using a “within” estimator for our firm–level panel data (Borusyak and Jaravel, 2016; Wooldridge, 2010; Imbens and Wooldridge, 2007; Angrist and Pischke, 2009). The traditional ‘two-period’ difference-in-differences model can be thought of as a special case of the two-way fixed effects approach.

$$y_{i,t} = \alpha_i + \lambda_t + \sum_{j=-2}^3 \beta_j Act_{i,j} + \varepsilon_{i,t} \quad (1)$$

where the dependent variable $y_{i,t}$ is a CEO pay component for firm i in year t ($t \in [-3, 3]$), α_i and λ_t are firm and calendar-year fixed effects, respectively. Firm fixed effects capture the ‘treatment’ dummy, i.e. whether the firm is a target or match. Calendar-year fixed effects take care of the ‘event-time’ dummies, i.e. the number of years before or after activism. We do not have to introduce a separate treatment dummy, because it is perfectly collinear with firm fixed effects since it does not vary across time for each firm. Similarly, the event-time dummy is perfectly collinear with year fixed effects because it does not vary across firms.²³

$Act_{i,j}$ is a dummy variable that takes a value of 1 if firm i is a hedge fund target (belongs to the treatment group), and year $t - j$ is the year of activism. $Act_{i,j}$ is equal to 0 for all target firms in all years other than $t - j$. $Act_{i,j}$ is also 0 for all matched firms in all years. Thus, $Act_{i,j}$ is the typical difference-in-difference interaction term, that equals one for treated firms in the year $t - j$ and zero otherwise. In other words, $Act_{i,j}$ is the interaction between the treatment and event-time dummies. The β_j ’s are the difference–in–differences estimators of the effectiveness of the treatment, thus, our main coefficients of interest. Since, we are interested in the effect of hedge fund activism over time, we introduce three separate lags or post-treatment effects in our model ($\beta_1, \beta_2, \beta_3$), instead of using just a single dummy that is switched on post-treatment. We also use two pre-treatment leads (β_{-2}, β_{-1}) or an anticipatory effect.²⁴ $\varepsilon_{i,t}$ is the error term.

We drop the $Act_{i,-3}$ dummy in our estimation of equation 1.²⁵ Therefore, a significant positive (negative) β_j coefficient on the $Act_{i,j}$ dummies should indicate that, compared to the average level of compensation in year t_{-3} , a CEO pay component is higher (lower) in the years t_{-2} onwards, for the activism targets as compared to matched firms.

Table 7 provides the estimation results for equation 1 for each individual component of CEO

²³The event-time dummy is analogous to the *Post* dummy in typical difference-in-differences regressions, where $Post = 1$ after event and $Post = 0$ before event.

²⁴Essentially, introducing leads and lags is analogous to using an ‘impact’ function of time, $\beta_0(t)$, that measures the trend of compensation before and after activism for the target and matched firms (Andreß et al., 2013).

²⁵We drop $Act_{i,-3}$ because of the dummy variable trap since we do not drop the intercept term. Even though we take firm fixed effects, we still have an estimate for the intercept which is nothing but the average of $\hat{\alpha}_i$ across all i , for the time period of the omitted dummy, t_{-3} .

pay. For all estimated coefficients, we report in parentheses Huber/White heteroscedasticity-consistent standard errors for the null hypothesis that the coefficient on a given independent variable is equal to 0. The last row reports the p -value of an F -Test for the null that the estimated coefficients on the independent variables are jointly equal to zero.

Column 1 shows results for the base salary. Target and matched firm CEOs' salary is not different before activism, both in terms of economic magnitude and statistical significance. One year after activism, target firm CEOs are paid \$28 thousand less than their peers relative to the benchmark level in t_{-3} , and this difference is statistically significant. This decline in the base salary conforms to our expectation that activists reduce that component of pay which is fixed, and not sensitive to firm performance. In Column 2, we find no significant differences between target and matched firm non-equity bonuses before and after activism. Though bonus plans are usually non-linear and are frequently criticized for encouraging excessive risk-taking (Murphy, 2013), we find that activism does not change the bonuses given to our target firm CEOs.

From Column 3, we see that the value of the stock awarded to target firm CEOs is significantly higher than the matched firms, in years t_{-2}, t_{-1} and t_0 relative to t_{-3} . In the year of activist entry, target firm CEOs earn \$321 thousand more in stock incentives than their peers, and this difference is statistically significant at the 1% level. One year after activism, stock incentives awarded to target CEOs drop and they are not different from their matched peers. The difference is insignificant in years t_2 and t_3 as well. This evidence is in contrast to our prior that performance related pay improves after the entry of an activist hedge fund. We provide two possible explanations for this finding.

First, stock awards might not be truly fulfilling their role to motivate CEOs to improve performance, but are rather being used to over-compensate CEOs as an alternative to base salary. Although companies assert that incentive compensation is performance based, many incentive plans enrich CEOs without sufficient returns to firms (Barris, 1992). Second, the role played by incentives in motivating managers to improve firm values becomes secondary in the presence of hedge fund activists. In other words, hedge fund activism acts as a substitute for incentive compensation.

In the absence of activism, stock awarded to target firm CEOs is a significant impetus to improve firm value since the CEOs also get a share of this value improvement. Compensation that is related to firm performance, however, exposes risk-averse managers to too much volatility in their pay (Frydman and Jenter, 2010), and is therefore costly for awarding firms. Also, one

of the main objectives of hedge fund activists is to help target firms maximize firm value (Brav et al., 2008). Once an activist enters a target firm, the compensation committee, in awareness of the subsequent value improvement that activism will bring about, reduces the burden of risk imposed by high incentive compensation on CEOs.

We also note that the influence of activism is effective only one year after entry. This lag captures the fact that sometimes activists might enter a target firm in the middle of the year, by which time, decisions on pay have already been made by the compensation committee. Column 4 shows that option compensation does not differ significantly for the target firms as compared to the matched firms, before and after activism. Options lost popularity as a means of compensating CEOs post the FAS 123R regulation on option-expensing. Given that our compensation data is post FAS 123R, it implies that activism does not influence ESOs since they were not widely used during this period in the first place.

Column 5 of Table 7, shows that other forms of compensation, such as perquisites and deferred earnings, are higher for the target firm CEOs than their peers in year t_{-2} relative to t_{-3} , after which it begins to decline. Post activism, in years t_1 and t_2 , this decline in other forms of pay is even steeper. In year t_2 , target firm CEOs receive \$109 thousand less than their peers in other types of compensation, and this difference is significant at the 5% level. Perquisites are the most important component of other forms of pay and have been associated with rent-extraction by CEOs (Jensen and Meckling, 1976). A further reduction in CEO perks post activism highlights the disciplining role played by hedge fund activists.

In Column 6 for total compensation, the coefficients β_{-2} and β_{-1} are positive and statistically significant at the 5% and the 10% level respectively. In terms of economic magnitude, target firms pay their CEOs \$355 thousand (\$329 thousand) more than their matched peers in year t_{-2} (t_{-1}) as compared to the total pay in t_{-3} . Total compensation of target firm CEOs substantially declines in t_1 in terms of economic magnitude, and reaches a level which is not significantly different from their matched peers. This finding implies that target firms pay their CEOs much more than their peers before the activist's entry. After activism, total pay of target firm CEOs declines to a level comparable to their peers, adhering to our conjecture that hedge fund activism reduces overall pay which is also consistent with the findings of Brav et al. (2008). This pattern in total compensation is driven primarily by stock awards. In order to establish whether stock awards are over-compensating CEOs, or whether activism and incentive compensation are substitutes, we further investigate if pay is in reality sensitive to firm performance.

As a starting point, we first measure the pay-for-performance sensitivity of our entire panel of target and matched firms. Following the literature (Murphy, 1999), we use this typical fixed-effects regression to estimate pay-for-performance relations:

$$y_{i,t} = \alpha_i + \lambda_t + \delta ME_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

where $y_{i,t}$ is a CEO pay component for firm i in year t , α_i and λ_t are firm and calendar-year fixed effects, respectively. $ME_{i,t-1}$ is the lagged fiscal year-end market capitalization of the firm (or firm value) used as a measure of lagged firm performance (Hartzell and Starks, 2003).²⁶ ²⁷ The estimated coefficient δ measures the sensitivity of CEO pay to lagged firm performance, for all target and matched firms in a combined sample (Jensen and Murphy, 1990). The estimated intercept in equation 2 is the average of the estimated firm-fixed effect coefficients $\hat{\alpha}_i$, and captures the fixed or performance-insensitive part of pay. $\varepsilon_{i,t}$ is the error term.

Panel A of Table 8 reports the estimation results from equation 2. Even though the base salary constitutes the fixed part of CEO pay, it is positively related to firm performance with $\delta = 0.009$, similar to estimates in the literature (Jensen and Murphy, 1990; Murphy, 1999; Hartzell and Starks, 2003). For stock awards, the intercept term implies that target and matched firm CEOs receive an average stock pay of \$342 thousand for years in which lagged firm value is zero. The estimated ME coefficient shows that CEOs receive an additional \$0.101 in stock for every \$1000 increase in firm performance. Total CEO compensation, of both target and matched firms, is also positively and significantly related to lagged firm performance.

We now investigate how firms' pay-for-performance sensitivity changes over time, and differs across target and matched firm. This exercise is analogous to the difference-in-differences estimation of equation 1, just that now we decompose every individual component of pay into a fixed part and a performance sensitive part. Equation 1, on the other hand, analyzes changes in the overall level of each individual component of pay.²⁸ Therefore, for our panel of target and control firms, we use the following regression specification to obtain difference-in-differences

²⁶Henceforth, we will use the terms firm 'value' and firm 'performance' interchangeably.

²⁷We repeat our analysis using current firm performance, and a vector of both contemporaneous and lagged firm performance (Murphy, 2013), but find qualitatively similar results.

²⁸For example, think of $Salary = \alpha + \beta FirmPerformance$, where α captures the fixed part and β , the pay for performance sensitivity. Even though the base salary is not meant to be very sensitive to firm performance, we still decompose it into a fixed and variable part.

estimates of pay-for-performance sensitivities (Cuñat and Guadalupe, 2009):

$$\begin{aligned}
y_{i,t} = & \alpha_i + \lambda_t + \sum_{j=-2}^3 \beta_j Act_{i,j} + \delta ME_{i,t-1} + \psi(TreatmentDummy * ME_{i,t-1}) \\
& + \sum_{j=-2}^3 \kappa_j(EventTimeDummy_{i,j} * ME_{i,j-1}) + \sum_{j=-2}^3 \gamma_j(Act_{i,j} * ME_{i,j-1}) + \varepsilon_{i,t}
\end{aligned} \tag{3}$$

where $y_{i,t}$ is a CEO pay component for firm i in year t , α_i and λ_t are firm and calendar-year fixed effects, respectively. Similar to equation 1, $Act_{i,j}$ is a dummy variable that takes a value of 1 if firm i is a hedge fund target (belongs to the treatment group), and year $t - j$ is the year of activism. $Act_{i,j}$ now captures the changes in the fixed part of each individual pay component following activism, unlike equation 1 where it captured changes in the overall level of each pay component. Thus, a significant positive (negative) β_j coefficient on the $Act_{i,j}$ dummies should indicate that, compared to the average level of ‘fixed’ pay in year $t-3$, the ‘fixed’ part of a CEO pay component is higher (lower) in the years $t-2$ onwards, for the activism targets as compared to matched firms.

$ME_{i,t-1}$ is the lagged firm value, and δ captures the basic pay-for-performance sensitivity of all firms in the sample. $TreatmentDummy$ is a dummy equal to 1 for target firms and 0 for matched firms, over all the years. The coefficient ψ captures the difference in pay-for-performance sensitivity between target and matched firms, throughout the entire time period. $EventTimeDummy_{i,j}$ is a dummy equal to 1 in the year $t - j$ and 0 otherwise, for all firms-target and control. Thus, κ_j captures the difference in pay-for-performance sensitivity over time, for all firms.²⁹

The $Act_{i,j}$ dummy is nothing but the interaction between the $TreatmentDummy$ and $EventTimeDummy_{i,j}$. The interaction of the $Act_{i,j}$ dummy with lagged firm performance $ME_{i,j-1}$, therefore, captures the change in pay-for-performance sensitivity, following activism, in target firms as compared to matched firms. Thus, a significant positive (negative) γ_j coefficient should indicate that, compared to the pay-for-performance sensitivity in year $t-3$, pay-for-performance sensitivity is higher (lower) in the years $t-2$ onwards, for the activism targets as compared to matched firms.³⁰ $\varepsilon_{i,t}$ is the error term.

Panel B of Table 8 reports the results from equation 3. For brevity, we only report the main

²⁹In equation 1, we do not introduce a separate $TreatmentDummy$ or $EventTimeDummy_{i,j}$, because they are perfectly collinear with firm and year fixed effects, respectively.

³⁰This approach can be viewed as a triple differences analysis.

coefficients of interest – coefficients on the $Act_{i,j}$ dummy, capturing changes in the fixed part of pay, and coefficients on the $Act_{i,j} * ME_{i,j-1}$ variables, capturing the changes in sensitivity of CEO pay to firm performance. The $Act_{i,j}$ coefficients in Columns 1 to 6, reveal that the fixed part of all CEO pay components is not significantly different at target and matched firms, both before and after activism.

The $Act_{i,j} * ME_{i,j-1}$ coefficients in Column 3 show that stock awarded to target firm CEOs is more sensitive to lagged firm performance relative to matched peers, in years t_{-1} and t_0 . More specifically, in year t_{-1} , stock awarded to target firm CEOs increases by \$0.223 more than peers, for every \$1000 increase in past firm performance. One year after activism, the difference between the pay-for-performance sensitivity of stock awards at target and matched firms is insignificant. Year t_3 sees an increase in the pay-for-sensitivity difference between target and matched firms. Column 6 shows that the sensitivity of total compensation to past firm performance is significantly higher for target firms, relative to their peers from years t_{-2} to t_{-1} in comparison to year t_{-3} . From year t_0 the difference between pay-for-performance sensitivity at target and matched firms declines, and becomes statistically insignificant.

But three years after activism, target firm total CEO compensation is again more sensitive to past firm performance as compared to matched firms. The coefficient on the $Act_3 * ME_2$ dummy shows that three years after activism, for every \$1000 increase in past firm performance, total compensation of target firm CEOs increases by \$0.332 more as compared to matched firms, and this difference is significant at the 5% level. We also find that after activism, the pay-for-performance sensitivity of base salary, employee stock options and other compensation is significantly lower for target firm CEOs, compared to their peers. The sensitivity of bonuses to firm performance also declines after activism, for target CEOs in comparison to their matched counterparts.

These results show that the entry of activists is making target firm CEO pay less sensitive to firm performance, relative to non-target firms. This relation is consistent with the notion that activists guide and assist target CEOs in improving firm value, diminishing the need for CEO compensation to be made highly sensitive to firm performance, which imposes too much risk on CEOs and an additional cost on the firm (Frydman and Jenter, 2010; Murphy, 2013). In other words, monitoring by activist hedge funds can function as a substitute mechanism, for incentive-laden compensation that is tied to firm performance (Hartzell, 1998). Three years after activism, around the time when an activist exits, total and stock compensation at target

firms is again more sensitive to firm performance as compared to matched firms. This evidence ascribes to the renewed need for CEOs to fill the void left by activists in improving shareholder value. Our results do not offer support for the view that target firms use incentives to over compensate their CEOs.

Our findings contrast with Brav et al. (2008) who find that activism enhances pay-for-performance, but a direct comparison of our results to theirs is a fallacy. This is because Brav et al. (2008) measure pay-for-performance sensitivity as the percentage of CEO take home pay (including option exercise) that comes from equity-based incentives, and run univariate *t*-tests on differences with matched peers. On the other hand, we estimate direct Jensen and Murphy (1990) type regressions which are typically used in the compensation literature to assess pay-for-performance sensitivity. We also consider stock awards as distinct from option awards, instead of combining the two together as equity awards, because of the change in option expensing rules post 2006. Moreover, we use option grants instead of option exercises, because activists can influence an option grant more relative to an exercise, which is the CEO's choice.

Furthermore, Hartzell and Starks (2003) in their study of traditional institutional shareholders like mutual funds, find that pay-for-performance sensitivity of total pay, cash compensation and option grants is positively related to the concentration of institutional ownership. Thus, our finding is suggestive of a different approach taken by hedge fund activists, relative to other traditional shareholder activists, in monitoring firm management.

Panel C of Table 8 excludes instances of post-activism takeovers of target firms. This is because in many instances, sale of the target company might be an objective of hedge fund activism in itself (Brav et al., 2008), which can preclude changes in CEO compensation after activism. Also, target firm CEOs can negotiate personal financial benefits during mergers (Hartzell et al., 2004). One-fifth of all hedge fund targets during 2000 – 2012 received a takeover bid within two years of activism, and since 2007 this proportion has risen by 24% (Boyson et al., 2016). We consider only those mergers that happened no later than two years after activism, since the average holding period of activists is around 22 months (Brav et al., 2008). 57 of our 244 activism targets were taken over after activism and 18 target firms have repurchases within two years after activism.³¹ Since both capital structure changes and sale of a target company entail objectives that are different from governance-related activism (Brav et al., 2008; Greenwood

³¹Thomson One Banker flags as Repurchases (R) a situation when a company buys back its shares in the open market, or in privately negotiated transactions, or when a board authorizes the repurchase of a portion of its shares. These deals have the same firm listed as both the target and acquiror.

and Schor, 2009), we exclude these events in Panel C, and run regressions on a smaller sample of 169 target firms (and their corresponding matched firms). The corresponding results are qualitatively similar to the full sample in Panel B.

Panels A and B of Table 9 present results from further robustness checks. In Panel A, we report results from equation 1, for the sub sample of target firms that did not have an M&A or share buyback after activism. Our estimates for total compensation and stock awards for this sub sample are consistent with results from the full sample as shown in Table 7, except for in the year t_3 . We see that three years after activism, CEOs belonging to targets that are neither sold nor have had capital structure changes are paid \$724,000 (\$466,000) more than their peers in terms of total pay (stock awards), and this difference is statistically significant at the 5% level. This is in contrast to the results from the full sample, where we find no significant differences between target and matched firm total or stock compensation in year t_3 .

We attribute the above result to the activists exiting a firm after two years, since the average holding period of activists is around 22 months (Brav et al., 2008). The results suggest that once an activist exits a firm, the compensation committee needs to reinstitute incentive compensation to align managerial interests with shareholders, which in turn drives up total pay. If we include target firms with M&As and repurchases after activism, this finding no longer holds because the exit of an activist would be accompanied by very specific changes to firm strategy, such as a new ownership or capital structure, and consequently involve specific changes to CEO compensation. Thus, including target firms with M&As and repurchases can dilute the results of only looking at the impact of general activism on compensation.³²

Given that CEO turnover is high at approximately 13.5% in both target and matched firms one year after activism, we want to check if the reduction in target firm CEO compensation post activism is driven by replacing the old CEO with a new lower paid CEO, or if it indeed comes from a decrease in the incumbent CEO's pay. In Panel B of Table 9, we control for CEO turnover, and exclude both target and matched firms with a change in CEO immediately after activism, in the years t_0 and t_1 .³³ Our conclusions for solely those CEOs that remain in the firm after activism, are identical to the results from the full sample including CEO turnover firms in Table 7. Target CEOs' total and stock compensation is significantly higher than their

³²We also estimate regressions involving only those firms that have M&As or repurchases after activism, but we can't draw meaningful conclusions from their results since the sample size is very small.

³³We also try alternative specifications where we drop firms with CEO turnover in all years, in only years post activism, in only target firms, but results are qualitatively similar.

peers before activism, and becomes insignificant after activism. The reduction in pay for target firm CEOs, post-activism, is not induced by hiring a new CEO who is paid less.

4 Conclusion

This paper applies a difference-in-differences estimation technique to firm-level panel data, to analyze how hedge fund activism influences the compensation of target firm CEOs relative to their peers. Before the entry of a hedge fund activist, target firm CEOs receive higher stock and total compensation relative to industry, size and book-to-market matched peers. Activism is accompanied by a significant reduction in the level of stock awards and total compensation at target firms, to levels prevalent at matched firms. Activism further keeps a check on CEO pay at target firms, in the form of a decrease in base salary and other types of compensation such as perquisites.

Our results are robust to controlling for CEO turnover at target and matched firms. Reduction in target firm CEO pay, after activism, is not driven by hiring a new lower-paid CEO. Our findings also hold for a sub-sample of target firms that do not have takeovers and share repurchases after activism. M&As and share buybacks are very specific activism objectives that are orthogonal to corporate governance improvements, and excluding these instances provides a neater picture.

Since stock awards help align managerial interests with firm value, it is surprising to find a reduction in the level of stock awards in target firms, post-activism. We test if this decrease is induced by target firm CEOs extracting rents prior to activist entry, in the form of stock compensation which is not sensitive to firm performance. We find that the sensitivity of stock awards and total pay to past firm performance, is significantly higher for target firms relative to their peers, before activism. Thus, our results dismiss the rent-extraction story, by showing that target firm CEOs were indeed compensated in accordance to firm performance.

Furthermore, we find that activists' entry is associated with a reduction in the pay-for-performance sensitivity of target CEOs' total pay and stock incentives, as compared to non-target firms. Around the activist's exit, the pay-for-performance sensitivity of incentive compensation again increases, suggesting that compensation and activism act as *substitutes*. Therefore, the role of incentive compensation in motivating CEOs to improve firm value, is auxiliary in the presence of monitoring by activist hedge funds, who can make strategic decisions themselves

to maximize target firm value, in order to increase the value of their own portfolio. Once an activist exits, incentive pay again becomes pivotal in aligning CEO interests with the broad shareholder interest of firm value improvement. This result is novel and undocumented by any previous study in the literature on hedge fund activism.

Overall, we show that hedge fund activists significantly influence the corporate governance of their target firms, via the specific channel of CEO compensation.

Appendix

A Institutional and Regulatory Background for Hedge Funds

Several barriers limit corporate monitoring by traditional institutional investors like mutual and pension funds. Public pensions funds are subject to fiduciary responsibilities where broad diversification is considered safe investing (Black, 1990). Also, fund managers suffer from conflicts of interest in the form of pressure to be pro-manager for client firms, or pressure from politicians (Black, 1990). Moreover, money managers might encounter collective action problems in bearing the costs of disciplining management because of few economic incentives (Rock, 1991). Funds regulated by the Investment Company Act, 1940, are limited in the types of fees that they can charge in addition to other shorting and borrowing restrictions (Brav et al., 2008).

Hedge funds are privately organized investment vehicles that avoid trading regulations imposed by the Investment Company Act, on institutional investors like mutual and pension funds, by offering their securities only to high net-worth (\$1 million and above) sophisticated investors (Partnoy and Thomas, 2007). Hedge funds make use of either the Section 3(c)1 or the Section 3(c)7 exemption of the Investment Company Act. Roughly speaking, Section 3(c)1 limits the number of investors in the fund to 100, and hedge funds using this exemption offer their securities to mostly ‘accredited’ investors with a minimum net worth of \$1 million. Section 3(c)7 on the other hand, does not limit the number of investors, but places a higher minimum net worth requirement of \$5 million on investors that are deemed as ‘qualified purchasers’. Hedge funds generally also limit themselves to a maximum of 35 ‘non-accredited’ investors, in order to comply with Rule 506(b) to be exempt from the registration requirements of the Securities Act, 1933. Thus, majority of hedge fund investors are wealthy individuals and hedge fund investments are not widely available to public investors.

Hedge funds are run by professional investment managers with significant equity investments in the fund, and remuneration packages which typically consist of a fixed annual fee, usually 2% of assets under management, and a bonus equal to 20% of returns generated. Given the exemption from regulatory barriers and personal financial incentives, hedge fund managers are motivated to hold highly concentrated positions in financially healthy, small and ‘value’ firms (Brav et al., 2008). In order to avoid a perceived takeover threat by the market, hedge funds quietly accumulate less than 5% of the target’s stock, sometimes alongside a loose network

of other activist investors (Coffee and Palia, 2016; Brav et al., 2016). On crossing the 5% threshold, hedge funds are required by Section 13(d) of the Securities Exchange Act, 1934 to make a Schedule 13D or beneficial ownership report filing with the SEC, within a 10 day window.

In fact, most of the target’s stock is acquired during this 10 day window, but activists don’t usually cross the 10% threshold to avoid Section 16(b) of the Securities Exchange Act, 1934 (Coffee and Palia, 2016; Wong, 2016). This ‘short-swing’ rule requires any beneficial owner of more than 10% of the security to surrender any profits realized from the sale and purchase of equity, within any period of less than 6 months. The Section 13(d) regulation applies to those hedge funds which intend to influence control of the target firm, hence, we define our activism sample to consist of those hedge funds that file a 13D. Passive institutional investors who acquire a stake between 5% to 10% in the target firm as a part of the ordinary course of their business, and not with an intention to influence control of the target, can instead file a Schedule 13G within 45 days after the end of the calendar year in which they cross the threshold.

B FAS 123R Regulation

U.S. firms awarding employee stock options (ESOs) are required to account for them, by the U.S. Generally Accepted Accounting Principles (GAAP) and the Financial Accounting Standards Board (FASB). Prior to 2004, firms were allowed to use the *intrinsic value based method* to account for options, as prescribed by the Accounting Principles Board (APB) in its Opinion 25 (APB, 1972). Effective January 2006, the new FAS 123R rule made it mandatory that all firms have to use the *fair value based method of accounting* for expensing options (FASB, 2004a,b).

Under the fair value method, compensation cost at the grant date is based on the value of the ESO over the vesting period, calculated using an option pricing model such as the binomial lattice or Black Scholes. However, under the Opinion 25’s intrinsic value method, firms were allowed to approximate the intrinsic value of ESOs using simply the exercise value of the options. Because ESOs are usually granted at the money, the exercise price is equal to the grant day stock price. Consequently, the intrinsic value of ESOs was usually reported as zero and firms did not record any expense related to new stock option grants (Damodaran, 2005).

Thus, before 2006, the Summary Compensation Table in the proxy statement did not report the dollar value of the equity-based awards as a compensation expense, rather just the number of shares underlying the options. This reporting changed after 2006, whereby firms were required

to show the grant date fair value (in dollars) of the option award as compensation, in the year in which the grant is made (SEC, 2006).

C How Hedge Fund Activism Influences CEO Compensation

To further explain our timeline in Figure 1, we provide a specific example of the CEO of the firm Midas Inc., which was targeted by activist hedge fund Silverstone Capital LLP. Exhibit 1 presents an extract of the Summary Compensation Table from the April 2011 Midas's proxy statement for fiscal year ending December 2010.

On 23-September-2009, Silverstone Capital filed a Schedule 13D with regards to its ownership in Midas Inc. Thus, the event year t_0 is 2009. The difference between total CEO compensation in fiscal year $t_0 = 2009$ and $t_{-1} = 2008$ is only \$23 thousand approximately. However, there is a decrease in total compensation from \$2.5 million in year t_0 to \$1.2 million in year $t_1 = 2010$. This decline is primarily because the CEO is not awarded any equity-based compensation in year t_1 , and also because of a slight reduction in other types of compensation. Thus, the entry of activist hedge fund Silverstone Capital, in t_0 , can influence decisions of the compensation committee of target firm Midas Inc., for wages to be paid in t_1 .

Exhibit 1: CEO Compensation from $t_{-1} = 2008$ to $t_1 = 2010$ for Midas Inc.

Summary Compensation Table

Name and Principal Position	Year	Salary (\$)	Bonus (\$)	Stock Awards (\$)(a)	Option Awards (\$)(a)	Non-Equity Incentive Plan Compensation (\$)	Change in Pension Value and Nonqualified Deferred Compensation Earnings (\$)(b)	All Other Compensation (\$)(c)	Total (\$)
Alan D. Feldman	2010	725,000(d)	—	—	—	300,770	133,565	55,120	1,214,455
Chairman, President and CEO	2009	725,000	—	868,560	578,560	157,637	105,992	83,793	2,521,542
	2008	725,000	—	882,760	582,000	156,835	127,810	70,493	2,544,898

Source: SEC Edgar, DEF 14A filing of Midas Inc., filed on 08-April-2011

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Table 1: Variable Definitions

This table provides definitions of variables along with information on how we gather data.

Variable	Definition	Data Source
$Act_{i,j}$	Dummy variable that takes a value of 1 if firm i is a hedge fund target and if year $t - j$ is the event year, where t_0 denotes the event year i.e. when hedge fund activism occurs or when the Schedule 13D is filed	Alon Brav's Dataset, Own Computation
$Act_{i,j} * ME_{i,j-1}$	Interaction of the $Act_{i,j}$ dummy with lagged market equity $ME_{i,j-1}$	Alon Brav's Dataset, COMPUSTAT, Own Computation
Bonus	Sum of the annual bonus and any other non-equity incentive plan compensation of the CEO for the fiscal year, reported in 1000s of US dollars, rounded off to the nearest thousand	Hand Collection: SEC
Book Equity (BE)	Book value of equity calculated as total shareholders' equity (SEQ), plus deferred taxes and investment tax credit ($TXDITC$), minus the book value of preferred stock ($PSTK$) as of fiscal year end, reported in millions of US dollars, rounded off to the nearest million	COMPUSTAT, Own Computation
Book-to-Market (BM)	Ratio of Book Equity (BE) to Market Equity (ME)	COMPUSTAT, Own Computation
CEO Turnover	Number of firms with a change in the CEO over a given period, calculated by checking if the name of the CEO is different from that in the previous year	Hand Collection: SEC, Own Computation
%CEO Turnover	Fraction of firms in the sample with CEO turnover expressed as a percentage	Hand Collection: SEC, Own Computation
Cumul%	Cumulative percentage of firms with CEO turnover since hedge fund activism	Hand Collection: SEC, Own Computation
$EventTimeDummy_{i,j}$	Dummy variable equal to 1 in the year $t - j$ and 0 otherwise, for all firms— target and control	Alon Brav's Dataset, Own Computation
$EventTimeDummy_{i,j} * ME_{i,j-1}$	Interaction of the $EventTimeDummy_{i,j}$ with lagged market equity $ME_{i,j-1}$	Alon Brav's Dataset, COMPUSTAT, Own Computation
Market Equity (ME)	Market Capitalization calculated as share price ($PRCC_F$) multiplied by number of shares outstanding ($CSHO$) as of fiscal year end, reported in millions of US dollars, rounded off to the nearest million	COMPUSTAT, Own Computation

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Variable	Definition	Data Source
Option	Employee stock options (ESOs) awarded to the CEO for the fiscal year, reported in 1000s of US dollars, rounded off to the nearest thousand	Hand Collection: SEC
Other	Changes in pension value, non-qualified deferred earnings and any other compensation such as perquisites given to the CEO for the fiscal year, reported in 1000s of US dollars, rounded off to the nearest thousand	Hand Collection: SEC
Ownership (\$MM)	Number of shares beneficially owned by the CEO (including shares underlying exercisable options) as of the record date, multiplied by share price (<i>PRCC_F</i>) as of fiscal year end, reported in millions of US dollars	COMPUSTAT, Hand Collection: SEC, Own Computation
Ownership (%)	Percentage of the firm's common shares outstanding beneficially owned by the CEO, as of the record date	COMPUSTAT, Hand Collection: SEC
Return on Assets (ROA)	Measure of operating profitability calculated as the ratio of earnings before interest expense, taxes, depreciation and amortization (<i>EBITDA</i>) to lagged assets (<i>AT</i>)	COMPUSTAT, Own Computation
Salary	Fixed base salary of the CEO for the fiscal year, reported in 1000s of US dollars, rounded off to the nearest thousand	Hand Collection: SEC
$\frac{\text{Salary}}{\text{Total}}$	Percentage of total compensation paid as base salary	Hand Collection: SEC, Own Computation
Stock	Stock-based awards to the CEO for the fiscal year such as restricted stock, restricted stock units, phantom stock, phantom stock units, common stock equivalent units or other similar instruments that do not have option-like features, reported in 1000s of US dollars, rounded off to the nearest thousand	Hand Collection: SEC
$\frac{\text{Stock}}{\text{Salary}+\text{Stock}}$	Percentage of salary plus stock awards paid as stock	Hand Collection: SEC, Own Computation
$\frac{\text{Stock}}{\text{Total}}$	Percentage of total compensation paid as stock awards	Hand Collection: SEC, Own Computation
Total	Overall Compensation of the CEO for the fiscal year, reported in 1000s of US dollars, rounded off to the nearest thousand	Hand Collection: SEC, Own Computation
<i>TreatmentDummy</i>	Dummy variable equal to 1 for target firms and 0 for matched firms, over all the years	Alon Brav's Dataset, Own Computation

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Variable	Definition	Data Source
$TreatmentDummy$	*	Alon Brav's Dataset,
$ME_{i,t-1}$	Interaction of the $TreatmentDummy$ with lagged market equity $ME_{i,j-1}$	COMPUSTAT, Own Computation

Table 2: Popular Activist Hedge Funds during 2009-2011

This table presents a list of activist hedge funds with more than four instances of activism during 2009 – 2011 in our sample. The third column ranks the funds in decreasing order of frequency of activism instances. Activism is identified as when a hedge fund files a Schedule 13D with the SEC, on acquiring 5% or more of beneficial ownership of a target firm with an intention to influence control.

Hedge Fund	Activism Instances	Rank
GAMCO INVESTORS, INC. ET AL	20	1
VA PARTNERS I, LLC	16	2
DISCOVERY GROUP I, LLC	11	3
ICAHN CARL C	10	4
SANDLER ONEILL ASSET MANAGEMENT, LLC	8	5
STILWELL JOSEPH	7	6
RAMIUS, LLC	6	7
SRB MANAGEMENT, L.P.	6	7
STARBOARD VALUE, L.P.	5	9

Table 3: Average and Median Compensation of Target and Match Firm CEOs

This table reports the mean (Panel A) and median (Panel B) level of compensation of CEOs of 244 U.S. publicly listed firms that were *targets* of hedge fund activism during 2009 to 2011, and their corresponding 244 industry, size and book-to-market *matched* firms. Mean and median figures are reported for 7 years – activism year, three years before activism and three years after activism. t_0 denotes the event year i.e. the year in which hedge fund activism occurs or when the Schedule 13D is filed. *Salary* is the fixed base salary and *Bonus* is the sum of the annual bonus and any other non-equity incentive plan compensation. *Stock* consists of stock-based awards like restricted stock and restricted stock units. *Option* awards comprise employee stock options. *Other* is composed of any changes in pension value, non-qualified deferred earnings and any other compensation such as perquisites. *Total* is the overall compensation awarded in the corresponding fiscal year. All compensation figures are in 1000s of US dollars, rounded off to the nearest thousand. $\frac{Salary}{Total}$ is the percentage of total compensation paid as base salary and $\frac{Stock}{Total}$ is the percentage of total compensation paid as stock awards. $\frac{Salary+Stock}{Total}$ is the percentage of salary plus stock awards paid as stock. Variable definitions appear in Table 1. All variables are winsorized at the 1% and 99% levels. We test for differences in mean (median) CEO compensation between the target and matched firms using the t -test (Wilcoxon signed-rank test), and report significance in the matched firm columns. ^a, ^b, ^c and ^d indicate statistical significance at the 1%, 5%, 10% and 15% levels, respectively.

	t_{-3}		t_{-2}		t_{-1}		t_0		t_1		t_2		t_3	
	Target	Match	Target	Match	Target	Match	Target	Match	Target	Match	Target	Match	Target	Match
<i>Panel A: Mean</i>														
(\$1,000)														
Salary	517	500	518	518	515	530	532	541	529	545	572	609	605	604
Bonus	394	658 ^b	409	526 ^c	410	501 ^d	380	643 ^a	526	739 ^c	699	929	647	773
Stock	509	566	712	462 ^b	709	532 ^d	984	667 ^b	769	808	1259	862 ^c	1498	1156
Option	612	553	539	571	581	520	553	480	427	479	638	681	612	679
Other	187	194	280	220	175	176	243	229	214	328	198	259	336	273
Total	2302	2681	2483	2479	2466	2337	2751	2815	2597	2954	3698	3475	4265	3453 ^d
Salary (%)	39.97	43.48	40.72	43.63	43.65	43.01	43.13	43.48	41.14	40.15	35.19	37.84	33.46	36.7
Stock (%)	13.43	11.43	15.06	11.57 ^b	17.55	14.61 ^c	20.08	15.70 ^b	19.8	17.57	22.35	18.99	24.63	22.65
No. of Obs	189	189	200	200	198	198	198	198	168	168	139	139	119	119
$\frac{Stock}{Salary+Stock}$ (%)	23.71	20.71	26.63	22.03 ^b	29.3	25.52 ^d	31.80	26.56 ^c	31.87	29.01	37.04	32.08	39.08	36.87
No. of Obs	188	188	195	195	194	194	198	198	166	166	137	137	118	118
<i>Panel B: Median</i>														
(\$1,000)														
Salary	429	431	449	465	444	473	452	450	444	476	500	569 ^d	550	570
Bonus	135	174 ^c	125	151	141	133	111	153 ^b	203	155	335	318	371	273
Stock	33	0	71	5 ^b	130	49 ^c	112	5 ^b	152	82	322	215	407	255
Option	162	79 ^b	176	102	74	65	9	23	0	29	34	55	0	96
Other	34	26	27	34	26	31	30	29	37	34	42	41	41	39
Total	1101	1003	1025	1146	1030	1160	1081	1239	1234	1114	1813	1902	1938	1895
Salary (%)	35.01	43.04	38.80	41.72	39.89	40.27	42.40	39.22	34.50	36.82	27.39	29.35	25.12	27.85
Stock (%)	2.28	0.00	5.42	0.49 ^a	10.59	4.76 ^c	11.90	1.14 ^b	12.07	9.98	20.29	14.66	22.38	18.60
No. of Obs	189	189	200	200	198	198	198	198	168	168	139	139	119	119
$\frac{Stock}{Salary+Stock}$ (%)	6.67	0	16.88	1.79 ^b	23.43	8.82	22.90	2.94 ^c	23.27	16	42.78	29.81	43.34	37.39
No. of Obs	188	188	195	195	194	194	198	198	166	166	137	137	118	118

Table 4: CEO Beneficial Ownership

This table reports the mean (Panel A) and median (Panel B) beneficial equity ownership of CEOs of 244 U.S. publicly listed firms that were *targets* of hedge fund activism during 2009 to 2011, and their corresponding 244 industry, size and book-to-market *matched* firms. Mean and median figures are reported for 7 years – activism year, three years before activism and three years after activism. t_0 denotes the event year i.e. the year in which hedge fund activism occurs or when the Schedule 13D is filed. Ownership (\$MM) denotes the market value in millions of US dollars of the number of shares beneficially owned by the CEO as of the record date. Ownership (%) is the percentage of the firm's common shares outstanding owned by the CEO. Ownership includes shares underlying exercisable options. Variable definitions appear in Table 1. Both variables are winsorized at the 1% and 99% levels. We test for differences in mean (median) CEO ownership between the target and matched firms using the t -test (Wilcoxon signed-rank test), and report significance in the matched firm columns. ^a, ^b, ^c and ^d indicate statistical significance at the 1%, 5%, 10% and 15% levels, respectively.

	t_{-3}		t_{-2}		t_{-1}		t_0		t_1		t_2		t_3	
<i>Panel A: Mean</i>														
Ownership (\$MM)	21.01	25.67	14.17	20.43 ^b	10.85	19.39 ^a	17.81	20.74	22.28	24.89	21.59	37.77 ^b	20.70	35.34 ^b
No. of Obs	176	176	195	195	193	193	188	188	165	165	135	135	114	114
Ownership (%)	4.68	6.75 ^b	3.99	6.66 ^a	3.96	6.42 ^a	4.57	6.03 ^c	4.17	6.06 ^c	4.66	6.51 ^d	4.50	5.00
No. of Obs	177	177	195	195	194	194	188	188	165	165	135	135	114	114
<i>Panel B: Median</i>														
Ownership (\$MM)	5.73	7.92 ^b	4.06	6.03 ^a	3.23	4.68 ^a	3.78	5.45 ^a	2.79	5.52 ^a	4.73	7.34 ^a	5.86	7.83
No. of Obs	176	176	195	195	193	193	188	188	165	165	135	135	114	114
Ownership (%)	2.15	2.81 ^c	1.78	2.49 ^a	1.86	2.33 ^d	2.09	1.96	1.81	1.82	1.74	1.83	1.43	1.57
No. of Obs	177	177	195	195	194	194	188	188	165	165	135	135	114	114

Table 5: CEO Turnover at Target and Match firms

This table reports the turnover figures of target and matched firm CEOs in our sample. Our CEOs belong to 244 U.S. publicly listed firms that were *targets* of hedge fund activism during 2009 to 2011, and their corresponding 244 industry, size and book-to-market *matched* firms. t_0 denotes the event year i.e. when hedge fund activism occurs or when the Schedule 13D is filed. *CEO Turnover* denotes the number of firms with a change in the CEO, calculated by checking if the name of the CEO is different from that in the previous year. *%CEO Turnover* is the percentage of firms in the sample with CEO turnover. *Cumul%* is the cumulative percentage of firms with CEO turnover since hedge fund activism. Variable definitions appear in Table 1.

Year	CEO Turnover		%CEO Turnover		Cumul%		No. of Obs	
	Target	Match	Target	Match	Target	Match	Target	Match
t_{-2}	21	23	8.61	9.43			244	244
t_{-1}	19	24	7.79	9.84			244	244
t_0	18	24	7.38	9.84			244	244
t_1	33	31	13.52	12.70	13.52	12.70	244	244
t_2	25	20	10.25	8.20	23.77	20.90	244	244
t_3	15	25	6.15	10.25	29.92	31.15	244	244

Table 6: Characteristics of the Average and Typical Target and Match Firm

This table reports the mean (Panel A) and median (Panel B) characteristics of 244 U.S. publicly listed firms that were *targets* of hedge fund activism during 2009 to 2011, and their corresponding 244 industry, size and book-to-market *matched* firms. Mean and median figures are reported for 7 years – activism year, three years before activism and three years after activism. t_0 denotes the event year i.e. the year in which hedge fund activism occurs or when the Schedule 13D is filed. Variable definitions appear in Table 1. All variables are winsorized at the 1% and 99% levels. We test for differences in mean (median) characteristics between the target and matched firms using the t -test (Wilcoxon signed-rank test), and report significance in the matched firm columns. ^a, ^b, ^c and ^d indicate statistical significance at the 1%, 5%, 10% and 15% levels, respectively.

	t_{-3}		t_{-2}		t_{-1}		t_0		t_1		t_2		t_3	
	Target	Match	Target	Match	Target	Match	Target	Match	Target	Match	Target	Match	Target	Match
<i>Panel A: Mean</i>														
ME (\$MM)	1340	1609	1239	1313	1110	1325	1153	1350 ^d	1332	1496	1912	2111	2256	2364
No. of Obs	212	212	225	225	235	235	244	244	209	209	179	179	154	154
BM (Equity)	0.66	0.67	0.78	0.80	0.87	0.89	0.72	0.70	0.64	0.77 ^c	0.53	0.63	0.46	0.55
No. of Obs	166	166	170	170	181	181	184	184	158	158	138	138	120	120
ROA	0.060	0.057	0.060	0.046	0.048	0.038	0.046	0.037	0.062	0.042	0.055	0.055	0.059	0.063
No. of Obs	213	213	227	227	234	234	235	235	202	202	174	174	150	150
<i>Panel B: Median</i>														
ME (\$MM)	270	306	199	266	157	213	173	248 ^a	184	267	251	328 ^c	304	421
No. of Obs	212	212	225	225	235	235	244	244	209	209	179	179	154	154
BM (Equity)	0.53	0.50	0.61	0.61	0.71	0.72	0.67	0.62	0.63	0.62	0.50	0.53	0.45	0.48
No. of Obs	166	166	170	170	181	181	184	184	158	158	138	138	120	120
ROA	0.090	0.093	0.077	0.076	0.070	0.077	0.071	0.091	0.084	0.089	0.075	0.093	0.079	0.103
No. of Obs	213	213	227	227	234	234	235	235	202	202	174	174	150	150

Table 7: Two-way Fixed Effects Regressions to Analyze the Impact of Hedge Fund Activism on CEO Compensation

This table presents difference-in-differences estimates of the impact of hedge fund activism on the compensation of target firm versus control firm CEOs. Our CEOs belong to 244 U.S. publicly listed firms that were *targets* of hedge fund activism during 2009 to 2011, and to corresponding 244 industry, size and book-to-market *matched* firms. For each of the components of CEO compensation, we estimate the following regression specification using a two-way fixed effects “within” estimator in a panel data framework:

$$y_{i,t} = \alpha_i + \lambda_t + \sum_{j=-2}^3 \beta_j Act_{i,j} + \varepsilon_{i,t}$$

The panel comprises of $y_{i,t}$, a firm-specific (i) CEO pay component running over 7 years (t) – activism year, three years before activism and three years after activism. 0 denotes the event year i.e. when hedge fund activism occurs or when the Schedule 13D is filed. Columns (1) to (6) provide the estimates from each individual pay component regression. *Salary* is the fixed base salary. *Bonus* is the sum of the annual bonus and any other non-equity incentive plan compensation. *Stock* consists of stock-based awards like restricted stock and restricted stock units. *Option* awards comprise employee stock options. *Other* is composed of any changes in pension value, non-qualified deferred earnings and any other compensation such as perquisites. *Total* is the overall compensation awarded in the corresponding fiscal year. α_i and λ_t are firm and calendar-year fixed effects, respectively. $Act_{i,j}$ is a dummy variable that takes a value of 1 if firm i is a hedge fund target, and year $t - j$ is the year of activism. $\varepsilon_{i,t}$ is the error term. Variable definitions appear in Table 1. All compensation figures are in 1000s of US dollars, rounded off to the nearest thousand. All compensation variables have been winsorized at the 1% and 99% levels. The last row reports the p -value of an F -Test for the null that the sum of the coefficients on the independent variables is zero. Huber/White robust standard errors for the null hypothesis, that the coefficient on a given independent variable is equal to 0, are reported in parentheses. ^a, ^b, ^c and ^d indicate statistical significance at the 1%, 5%, 10% and 15% levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Salary	Bonus	Stock	Option	Other	Total
<i>Act</i> ₋₂	-3.376 (9.374)	33.962 (56.754)	215.149 ^b (95.845)	-27.198 (66.488)	72.569 ^d (49.616)	354.960 ^b (177.131)
<i>Act</i> ₋₁	-2.160 (11.709)	-8.430 (75.166)	223.376 ^c (114.288)	59.327 (93.531)	-63.705 ^d (41.752)	329.344 ^c (189.846)
<i>Act</i> ₀	-4.017 (14.691)	-101.426 (86.247)	321.291 ^a (116.414)	6.720 (92.409)	-41.141 (47.737)	353.003 ^d (227.401)
<i>Act</i> ₁	-27.704 ^d (18.835)	-11.990 (120.668)	63.090 (147.268)	-99.616 (105.251)	-94.396 ^c (56.148)	51.435 (304.643)
<i>Act</i> ₂	-40.687 ^c (22.947)	15.198 (136.347)	195.316 (200.313)	45.366 (117.995)	-109.527 ^b (51.386)	386.851 (369.750)
<i>Act</i> ₃	-30.886 (23.502)	-75.896 (114.557)	129.909 (216.450)	-73.143 (124.272)	17.279 (69.670)	270.766 (354.905)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Calendar-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	2882	2882	2882	2882	2882	2882
R^2	0.873	0.713	0.678	0.642	0.674	0.819
F -Test	0.000	0.001	0.000	0.105	0.004	0.000

Table 8: Pay-for-Performance Sensitivity

This table presents an analysis of the pay-for-performance sensitivity at target and control firms. Our CEOs belong to 244 U.S. publicly listed firms that were *targets* of hedge fund activism during 2009 to 2011, and to corresponding 244 industry, size and book-to-market *matched* firms. In Panel A, we measure the pay-for-performance sensitivity of our entire panel of target and matched firms. For each of the components of CEO compensation, we estimate the following fixed effects regression in a panel data framework:

$$y_{i,t} = \alpha_i + \lambda_t + \delta ME_{i,t-1} + \varepsilon_{i,t}$$

The panel comprises of $y_{i,t}$, a firm-specific (i) CEO pay component running over 7 years (t) – activism year, three years before activism and three years after activism. 0 denotes the event year i.e. when hedge fund activism occurs or when the Schedule 13D is filed. Columns (1) to (6) provide the estimates from each individual pay component regression. *Salary* is the fixed base salary. *Bonus* is the sum of the annual bonus and any other non-equity incentive plan compensation. *Stock* consists of stock-based awards like restricted stock and restricted stock units. *Option* awards comprise employee stock options. *Other* is composed of any changes in pension value, non-qualified deferred earnings and any other compensation such as perquisites. *Total* is the overall compensation awarded in the corresponding fiscal year. α_i and λ_t are firm and calendar-year fixed effects, respectively. $ME_{i,t-1}$ controls for a firm’s lagged market capitalization. The estimated coefficient δ measures the sensitivity of CEO pay to lagged firm performance, for all target and matched firms in a combined sample. $\varepsilon_{i,t}$ is the error term. In Panel B, we provide difference-in-differences estimates of the impact of hedge fund activism on the sensitivity of pay to firm performance, of target firm versus control firm CEOs. We estimate the following regression specification using a two-way fixed effects “within” estimator in a panel data framework:

$$y_{i,t} = \alpha_i + \lambda_t + \sum_{j=-2}^3 \beta_j Act_{i,j} + \delta ME_{i,t-1} + \psi(TreatmentDummy * ME_{i,t-1}) + \sum_{j=-2}^3 \kappa_j(EventTimeDummy_{i,j} * ME_{i,j-1}) + \sum_{j=-2}^3 \gamma_j(Act_{i,j} * ME_{i,j-1}) + \varepsilon_{i,t}$$

$Act_{i,j}$ is a dummy variable that takes a value of 1 if firm i is a hedge fund target and if year $t - j$ is the year of activism. $Act_{i,j}$ captures the changes in the fixed part of each individual pay component following activism. $TreatmentDummy$ is a dummy equal to 1 for target firms and 0 for matched firms, over all the years. The coefficient ψ captures the difference in pay-for-performance sensitivity between target and matched firms, throughout the entire time period. $EventTimeDummy_{i,j}$ is a dummy equal to 1 in the year $t - j$ and 0 otherwise, for all firms– target and control. Thus, κ_j captures the difference in pay-for-performance sensitivity over time, for all firms. We interact the $Act_{i,j}$ dummy with lagged firm performance $ME_{i,j-1}$ to capture the change in pay-for-performance sensitivity, following activism, in target firms as compared to matched firms. For brevity, we only report the coefficients on the $Act_{i,j}$ dummy, and on the $Act_{i,j} * ME_{i,j-1}$ variable. In Panel C, we re-estimate the regression excluding target (and their corresponding matched) firms that were sold or had repurchases within two years of activism. Variable definitions appear in Table 1. All compensation figures are in 1000s of US dollars, rounded off to the nearest thousand, and market equity is in millions of US dollars. All financial variables have been winsorized at the 1% and 99% levels. The last row reports the p -value of an F -Test for the null that the sum of the coefficients on the independent variables is zero. Huber/White robust standard errors, for the null hypothesis that the coefficient on a given independent variable is equal to 0, are reported in parentheses. ^a, ^b, ^c and ^d indicate statistical significance at the 1%, 5%, 10% and 15% levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Salary	Bonus	Stock	Option	Other	Total
<i>Panel A: Absolute Sensitivity</i>						
Intercept	474.333 ^a (14.013)	595.650 ^a (69.539)	341.585 ^a (130.546)	562.732 ^a (78.953)	200.621 ^a (44.873)	2169.136 ^a (214.219)
ME_{t-1}	0.009 ^b (0.004)	-0.009 (0.030)	0.101 ^b (0.043)	0.019 (0.038)	-0.018 (0.020)	0.208 ^b (0.095)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Calendar-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	2813	2813	2813	2813	2813	2813
R^2	0.873	0.713	0.687	0.649	0.677	0.827
F -Test	0.000	0.000	0.000	0.259	0.022	0.000

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	(1)	(2)	(3)	(4)	(5)	(6)
	Salary	Bonus	Stock	Option	Other	Total
<i>Panel B: Difference-in-Differences</i>						
<i>Act</i> ₋₂	-3.412 (10.271)	-15.253 (63.263)	100.764 (93.782)	-24.248 (68.636)	37.230 (49.390)	26.192 (175.619)
<i>Act</i> ₋₁	-1.765 (12.992)	-45.436 (67.332)	20.394 (88.887)	101.060 (88.268)	-42.415 (38.229)	21.221 (162.867)
<i>Act</i> ₀	-2.729 (16.634)	-75.613 (78.866)	29.440 (85.884)	54.132 (91.679)	-17.876 (45.311)	-66.913 (215.102)
<i>Act</i> ₁	-18.872 (19.785)	63.077 (119.268)	-87.169 (117.028)	-1.217 (96.670)	-73.625 ^d (46.844)	-1.353 (285.627)
<i>Act</i> ₂	-29.628 (25.092)	88.074 (135.310)	125.177 (194.982)	177.068 ^c (107.282)	2.807 (47.027)	541.630 ^d (361.636)
<i>Act</i> ₃	-21.001 (24.390)	76.581 (118.116)	-129.778 (164.986)	-48.977 (107.473)	75.011 (64.676)	-207.126 (326.572)
<i>Act</i> ₋₂ * <i>ME</i> ₋₃	-0.005 (0.004)	0.069 ^d (0.044)	0.077 (0.060)	-0.008 (0.042)	0.022 (0.026)	0.226 ^c (0.124)
<i>Act</i> ₋₁ * <i>ME</i> ₋₂	-0.002 (0.005)	0.136 ^b (0.056)	0.223 ^a (0.068)	-0.011 (0.049)	-0.033 (0.031)	0.378 ^a (0.092)
<i>Act</i> ₀ * <i>ME</i> ₋₁	-0.007 ^d (0.004)	0.014 (0.046)	0.161 ^b (0.069)	-0.034 (0.071)	-0.033 (0.030)	0.219 (0.198)
<i>Act</i> ₁ * <i>ME</i> ₀	-0.012 ^a (0.005)	-0.065 (0.059)	0.104 (0.089)	-0.023 (0.063)	-0.055 (0.039)	-0.052 (0.137)
<i>Act</i> ₂ * <i>ME</i> ₁	-0.011 ^d (0.007)	-0.051 (0.073)	0.062 (0.115)	-0.096 ^c (0.058)	-0.058 ^c (0.033)	-0.075 (0.157)
<i>Act</i> ₃ * <i>ME</i> ₂	-0.002 (0.008)	-0.029 (0.041)	0.175 ^c (0.089)	-0.023 (0.061)	-0.048 (0.043)	0.332 ^b (0.166)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Calendar-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	2813	2813	2813	2813	2813	2813
<i>R</i> ²	0.875	0.735	0.720	0.659	0.699	0.840
<i>F</i> -Test	0.000	0.000	0.000	0.000	0.001	0.000

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	(1)	(2)	(3)	(4)	(5)	(6)
	Salary	Bonus	Stock	Option	Other	Total
<i>Panel C: No Sales or Repurchases</i>						
<i>Act</i> ₋₂	5.650 (12.432)	-54.789 (85.057)	182.645 ^d (121.156)	32.489 (67.937)	0.051 (64.076)	81.914 (230.689)
<i>Act</i> ₋₁	7.654 (15.956)	-62.482 (96.057)	87.067 (99.798)	78.378 (82.867)	-64.524 (52.398)	6.357 (209.227)
<i>Act</i> ₀	6.429 (17.892)	-58.020 (102.319)	-9.541 (102.922)	59.036 (84.657)	-59.756 (49.442)	-120.607 (252.003)
<i>Act</i> ₁	3.833 (19.625)	119.710 (149.137)	36.037 (120.811)	31.734 (90.976)	-79.158 (55.972)	249.758 (345.583)
<i>Act</i> ₂	-4.293 (24.638)	145.744 (161.031)	362.937 ^c (213.742)	209.846 ^b (104.958)	0.403 (55.104)	903.609 ^b (432.240)
<i>Act</i> ₃	-2.164 (25.631)	173.073 (128.292)	181.965 (176.498)	-46.491 (103.373)	65.822 (76.133)	198.441 (363.066)
<i>Act</i> ₋₂ * <i>ME</i> ₋₃	-0.009 ^b (0.004)	0.069 (0.055)	0.083 (0.077)	-0.073 (0.051)	0.005 (0.033)	0.186 (0.169)
<i>Act</i> ₋₁ * <i>ME</i> ₋₂	-0.002 (0.008)	0.151 ^c (0.084)	0.237 ^a (0.084)	-0.020 (0.056)	-0.078 ^b (0.034)	0.329 ^a (0.124)
<i>Act</i> ₀ * <i>ME</i> ₋₁	-0.011 ^b (0.005)	0.033 (0.059)	0.189 ^b (0.093)	-0.117 ^c (0.069)	-0.074 ^b (0.031)	0.176 (0.236)
<i>Act</i> ₁ * <i>ME</i> ₀	-0.018 ^a (0.006)	-0.095 (0.074)	0.082 (0.093)	-0.059 (0.070)	-0.097 ^b (0.049)	-0.243 ^c (0.147)
<i>Act</i> ₂ * <i>ME</i> ₁	-0.021 ^b (0.009)	-0.048 (0.090)	0.010 (0.073)	-0.131 ^b (0.051)	-0.109 ^a (0.030)	-0.257 ^d (0.164)
<i>Act</i> ₃ * <i>ME</i> ₂	-0.008 (0.009)	0.000 (0.045)	0.228 ^b (0.112)	-0.004 (0.058)	-0.083 ^c (0.047)	0.423 ^b (0.194)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Calendar-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	1986	1986	1986	1986	1986	1986
<i>R</i> ²	0.896	0.722	0.706	0.649	0.733	0.832
<i>F</i> -Test	0.000	0.000	0.000	0.000	0.000	0.000

Table 9: Robustness Checks

This table presents robustness checks for our main difference-in-differences analysis of the impact of hedge fund activism on the compensation of target firm versus control firm CEOs. Our CEOs belong to 244 U.S. publicly listed firms that were *targets* of hedge fund activism during 2009 to 2011, and to corresponding 244 industry, size and book-to-market *matched* firms. For each of the components of CEO compensation, we estimate the following regression specification using a two-way fixed effects “within” estimator in a panel data framework:

$$y_{i,t} = \alpha_i + \lambda_t + \sum_{j=-2}^3 \beta_j Act_{i,j} + \varepsilon_{i,t}$$

The panel comprises of $y_{i,t}$, a firm-specific (i) CEO pay component running over 7 years (t) – activism year, three years before activism and three years after activism. 0 denotes the event year i.e. when hedge fund activism occurs or when the Schedule 13D is filed. Columns (1) to (6) provide the estimates from each individual pay component regression. *Salary* is the fixed base salary. *Bonus* is the sum of the annual bonus and any other non-equity incentive plan compensation. *Stock* consists of stock-based awards like restricted stock and restricted stock units. *Option* awards comprise employee stock options. *Other* is composed of any changes in pension value, non-qualified deferred earnings and any other compensation such as perquisites. *Total* is the overall compensation awarded in the corresponding fiscal year. α_i and λ_t are firm and calendar-year fixed effects, respectively. $Act_{i,j}$ is a dummy variable that takes a value of 1 if firm i is a hedge fund target, and year $t - j$ is the year of activism. $\varepsilon_{i,t}$ is the error term. Variable definitions appear in Table 1. In Panel A, we exclude target (and their corresponding matched) firms that were sold or had repurchases within two years of activism. Panel B excludes target and matched firms with CEO turnover in the year of activism and one year post activism. All compensation figures are in 1000s of US dollars, rounded off to the nearest thousand. All compensation variables have been winsorized at the 1% and 99% levels. The last row reports the p -value of an F -Test for the null that the sum of the coefficients on the independent variables is zero. Huber/White robust standard errors for the null hypothesis that the coefficient on a given independent variable is equal to 0. are reported in parentheses. ^a, ^b, ^c and ^d indicate statistical significance at the 1%, 5%, 10% and 15% levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Salary	Bonus	Stock	Option	Other	Total
<i>Panel A: No Sales or Repurchases</i>						
Act_{-2}	3.217 (11.865)	38.821 (78.412)	266.977 ^b (127.505)	7.148 (74.197)	52.685 (63.518)	439.015 ^c (242.660)
Act_{-1}	7.462 (14.349)	14.239 (103.532)	255.251 ^c (139.093)	43.332 (100.894)	-91.261 ^c (49.563)	354.326 ^d (240.996)
Act_0	1.146 (16.478)	-36.527 (110.922)	254.034 ^c (140.948)	6.205 (90.484)	-111.647 ^b (45.071)	273.793 (273.995)
Act_1	-11.531 (18.867)	62.051 (148.065)	134.201 (162.488)	-59.679 (105.581)	-130.476 ^b (62.838)	213.879 (372.426)
Act_2	-25.478 (23.246)	117.825 (162.845)	320.655 (226.680)	95.989 (124.047)	-151.991 ^b (58.677)	619.426 (453.460)
Act_3	-22.181 (25.743)	61.458 (124.714)	465.587 ^b (231.278)	-34.094 (138.115)	-41.572 (80.233)	724.432 ^c (419.012)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Calendar-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	2040	2040	2040	2040	2040	2040
R^2	0.891	0.691	0.662	0.613	0.704	0.804
F -Test	0.000	0.001	0.000	0.171	0.017	0.000

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	(1)	(2)	(3)	(4)	(5)	(6)
	Salary	Bonus	Stock	Option	Other	Total
<i>Panel B: Excluding CEO Turnover</i>						
<i>Act₋₂</i>	-3.195 (9.334)	37.400 (57.013)	218.941 ^b (95.939)	-33.697 (66.869)	75.137 ^d (49.941)	357.295 ^b (177.627)
<i>Act₋₁</i>	-3.624 (11.562)	-5.865 (76.182)	228.421 ^b (115.236)	57.251 (94.801)	-60.061 (42.516)	335.392 ^c (192.285)
<i>Act₀</i>	5.380 (13.817)	-103.956 (87.806)	319.336 ^a (121.255)	-44.158 (89.174)	-34.926 (49.594)	311.778 (234.752)
<i>Act₁</i>	-5.205 (16.013)	38.085 (127.933)	103.042 (150.263)	-121.914 (99.678)	-68.024 (60.942)	144.880 (311.611)
<i>Act₂</i>	-45.412 ^b (22.923)	6.958 (137.541)	184.474 (201.212)	47.059 (118.324)	-114.260 ^b (51.675)	361.714 (372.144)
<i>Act₃</i>	-30.356 (23.677)	-78.678 (114.940)	122.509 (217.133)	-86.326 (124.197)	18.975 (69.982)	250.927 (355.789)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Calendar-year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	2782	2782	2782	2782	2782	2782
R^2	0.888	0.715	0.679	0.654	0.679	0.823
F -Test	0.000	0.001	0.000	0.023	0.003	0.000

Figure 1: Timeline of Activism

This figure depicts a timeline of when activist hedge funds can influence the compensation of their target firm CEOs. Activism is identified as when a hedge fund files a Schedule 13D with the SEC on acquiring 5% or more of beneficial ownership of a target firm with an intention to influence control. t_0 denotes the event year i.e. the year in which hedge fund activism occurs.

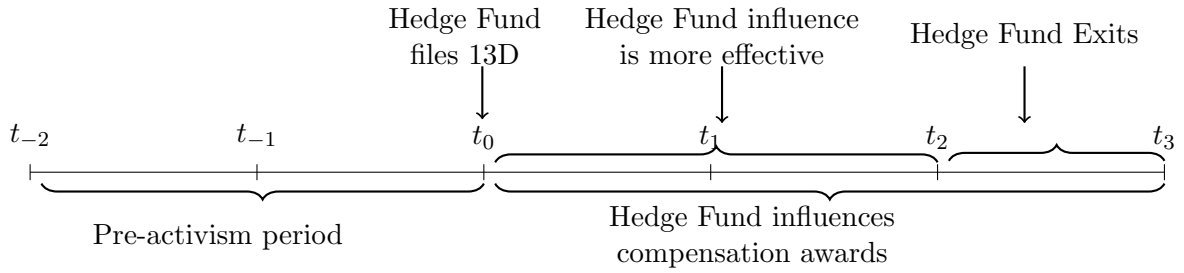
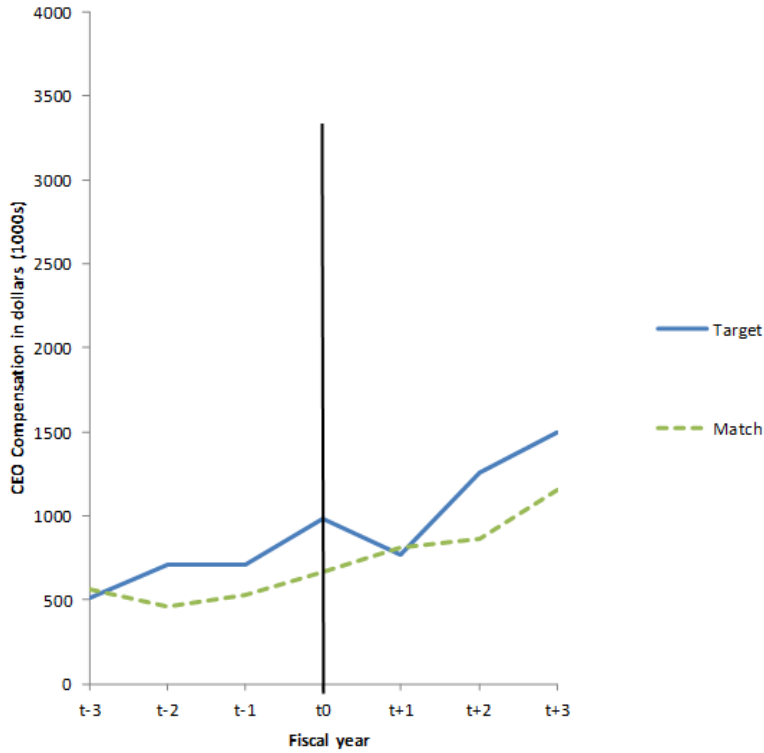
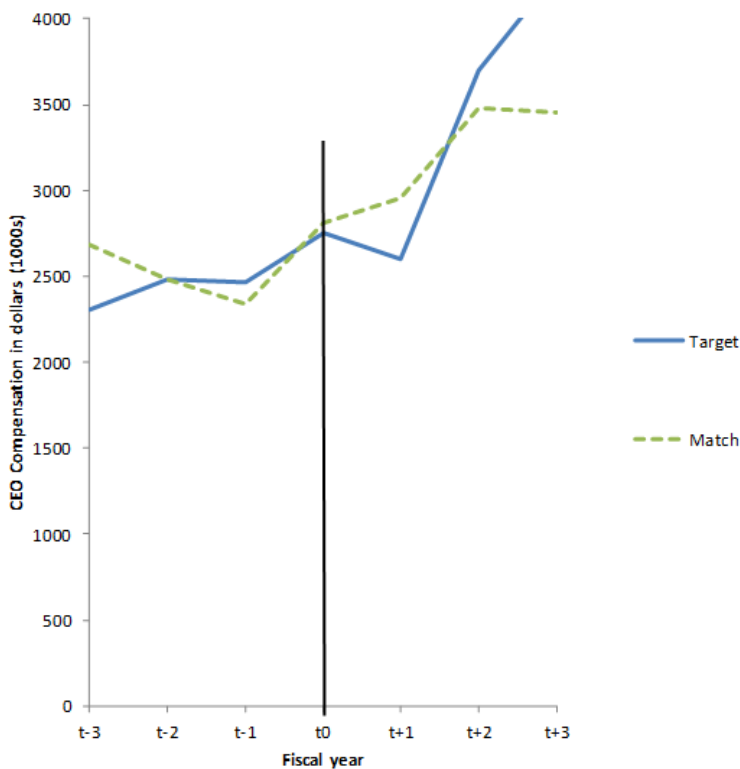


Figure 2: Difference-in-Differences

This figure plots the mean level of compensation of CEOs of 244 U.S. publicly listed firms that were *targets* of hedge fund activism during 2009 to 2011, and their corresponding 244 industry, size and book-to-market *matched* firms. Figures are reported for 7 years – activism year, three years before activism and three years after activism. t_0 denotes the event year i.e. the year in which hedge fund activism occurs or when the Schedule 13D is filed. Panel A graphs *Stock* awards which consist of stock-based awards like restricted stock and restricted stock units. Panel B shows *Total* compensation which is the overall compensation awarded in the corresponding fiscal year. Variable definitions appear in Table 1. All compensation figures are in 1000s of US dollars, rounded off to the nearest thousand. All variables are winsorized at the 1% and 99% levels.



Panel A: Stock Awards



Panel B: Total Compensation