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## **Activist Hedge Funds: Evidence from the Recent Financial Crisis**

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# Activist Hedge Funds: Evidence from the Recent Financial Crisis

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## Abstract

This study extends the empirical evidence of hedge fund activism impact on target firm performance. We investigate whether activism strategies as well as their effects have changed following the recent financial crisis of 2007–2008. The analysis is based on the U.S. data covering 112 hedge funds, 551 target firms, from 2000 to 2013. We find that returns to activism accrue to approximately 5% during the  $(-20, +5)$  event window. Activism-related categories that generate significant and positive abnormal returns include capital structure, business strategy, and general undervaluation. Since the financial crisis, business-related activism generates the highest returns, followed by activism in financially depressed firms. We also find significant cross-sectional abnormal returns, both before and during the crisis, for hedge funds who do not pre-specify an objective. One year post-activism performance suggests that target firms experience substantial improvement in value, profit margin, and investment.

*Keywords:* Hedge funds, event studies, crisis, corporate governance

*JEL classification:* G12; G14

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# 1 Introduction

Despite the tremendous growth in the US hedge fund industry following the global financial crisis, merely a few studies have empirically attempted to gauge the effects of the crisis on fund-targeted firms.<sup>1</sup> The financial crisis, on setting around mid-2007, undeniably challenges the traditional approach to activism due to additional regulatory bindings and a much competitive environment to the viability of fund activism. In addition, the crisis allows testing if there are any material changes in funds' targeting patterns and ways to influencing the firm's internal governance. This study examines the impact of the recent crisis by investigating whether activist funds have changed the targeting behavior and the firms' performance in the short-run and the long-term.

In their seminal study, [Berle and Means \(1932\)](#) posit that dispersed shareholders with a negligible ownership stake in sizeable US corporations assert less likely any significant influence by their monitoring. Modern corporate finance literature introduces distinct mechanisms to keep an adequate due diligence on the firm's management. The emphasis of such arrangements is to align the manager's interest with those of shareholders to alleviate the associated agency issues – however, empirical evidence suggests that so far these measures have appeared less successful in mitigating the agency problems ([Baker et al., 1988](#)). Of these monitoring means, the inclusion of blockholder is proposed on behalf of diffused shareholders ([Jensen, 1986](#)); however, the evolved outcomes have been economically insignificant ([Wahal, 1996](#); [Karpoff et al., 1996](#); [Black, 1998](#); [Carleton et al., 1998](#); [Romano, 2001](#)). The limited role of such monitoring has been subjected to free riding ([Shleifer and Vishny, 1986](#); [Black, 1998](#); [Kahan and Rock, 2007](#); [Partnoy and Thomas, 2007](#)), high cost ([Black, 1998](#); [Kahan and Rock, 2007](#)), limited investment ([Black, 1998](#); [Karpoff, 2001](#); [Parrino et al., 2003](#)), weak financial incentives ([Rock, 1990](#)), regulatory constraints ([Romano, 2001](#)), conflict of interest ([Davis and Kim, 2005](#)), among others.<sup>2</sup>

The activist hedge fund has successfully drawn considerable attention from both academics and industry through its effective monitoring and delivering substantial performance. The very organizational framework, including fewer regulations ([Ackermann et al., 1999](#)), relaxed taxations ([Jaeger, 2003](#)), sophisticated investment strategies, for example leverage, short selling, derivatives, and concentrated portfolios ([Partnoy and](#)

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<sup>1</sup>According to Hedge Fund Research (HFR) report, a leading research firm in hedge funds, the assets under management in the industry have reached up to \$2.9 trillion in first quarter of 2016 for more than 12,000 funds, [1]<https://www.hedgefundresearch.com/>

<sup>2</sup>These shortcomings or constraints have been widely discussed in non-hedge fund literature.

Thomas, 2007), (Jaeger, 2003, p. 133), and performance-based incentives (Ackermann et al., 1999) allows it to outperform other non-hedge funds. Contrary to limitations associated with non-hedge funds, a growing body of fund-related literature argues for its distinctive characteristics and presents it as a leading candidate in a monitoring role (Bratton, 2006; Briggs, 2007; Kahan and Rock, 2007; Partnoy and Thomas, 2007; Armour et al., 2009). Despite the crisis period, hedge fund related activism has persistently been generating positively significant abnormal returns for its investors (Becht et al., 2014).

The impact of hedge fund activism on target firms' performance has rigorously been discussed and studied in recent decades (Klein and Zur, 2006; Brav et al., 2008; Greenwood and Schor, 2009; Boyson and Mooradian, 2011; Bebhuk et al., 2014). The empirical findings of largely documented studies are consistent with the notion that fund-related activism generates positively significant abnormal returns around the announcement of Schedule 13D Disclosures. However, the evidence on long-term firm's performance is mixed and partly subjects to sample frame and composition.

A general consensus exists among the researchers that the stock market favorably reacts to the announcement of a fund's involvement in a target firm, and as a result, generates positively significant abnormal returns (Klein and Zur, 2006; Brav et al., 2008; Boyson and Mooradian, 2011). In pre-crisis sample studies, Klein and Zur (2006) report 10.3% abnormal returns over a relatively longer (-30, +30) event window including the date of notification. In another study, Greenwood and Schor (2009) utilizing long-horizon data (1993–2006), document 3.5% abnormal returns in 15 days event-window. To add more evidence, Brav et al. (2008) show seven percentage points abnormal returns in excess of matching firms based on size/book-to-market/industry in (-20, +20) event window and find no reversal in prices in the succeeding year of activism. The announcement related positively significant abnormal returns have signaled the market participants to reconsider traditionally prevailing thinking on activist investing. Recently, Becht et al. (2014) analyze stock performance across regions, including Asia, Europe, and North America, and report that the US market responds most to fund disclosures about 6.9% for (-20, +20) event window or 41 days.

Related to long-term performance in targets firms, the empirical evidence, however, is mixed and largely subjects to the sample frame and composition. In a seminal study, Brav et al. (2008) analyze the two-years post-activism changes in firms and find that tar-

gets have outperformed the nontargets in terms of profitability and payout when matched at industry/size/book to market value. In addition, they also find that at the governance level, targets experience higher CEO turnover following the activism. [Boyson and Mooradian \(2011\)](#) using a relatively longer panel from 1994 to 2007, and document that target firms' value improved when measured using Tobin's Q over the course of activism. Moreover, targets significantly reduced the excess cash thus showing the consistency in the widespread idea that activists reduce the agency costs of managerial discretion. Contrary to these findings, some studies report either adverse effects or no improvement in the target firms following the activism. [Klein and Zur \(2006\)](#), for instance, do not find evidence of improvement in firms' accounting measures of performance. Instead, targets experience a decline in earnings per share (*EPS*), return on assets (*ROA*), and return on equity (*ROE*) in the succeeding fiscal year. However, post-activism targets' excess cash reduced substantially and distributed among shareholders as dividends. The mixed findings on long-term effect along with significant abnormal returns in the short-run suggest that the shareholders perceive benefits to reducing agency costs of excess cash and short-term investments.

Using a hand-collected data for 112 hedge funds, 551 event firms over the period of 2000 to 2013, we study the impact of activism in two broadly distinctive perspectives; in general for the entire sample period and in particular for the crisis period. Related to activism, we are interested in to investigate whether the targeted firms are valued or growth stock. In addition, how activists do attempt to impact the internal governance of targets by influencing their managerial decisions? Are there any observable changes to targeting patterns following the crisis? Does crisis affect the returns to activism? In the case of a significant visible change in targeting trends, we extend to investigate how does activists' target perform differently than non-hedge funds' target? Some of these concerns have been partly discussed in prior fund-related literature ([Klein and Zur, 2006](#); [Brav et al., 2008](#); [Boyson and Mooradian, 2011](#)). In this study, we emphasis on addressing these questions testing the crisis effect in particular.

The activist hedge fund usually acquires a significant ownership stake in target firms to assert its influence strategically on a firm's management. In doing so, they normally target small and medium-sized firms. Targeting relatively a small-cap firm allows a fund to acquire a meaningful stake and induce pressure on management to consider their suggested measures in serious manners. In our sample, the characteristics of the targets demonstrate that the firms are, on average, small and medium-sized. In addition, they

resemble value stock; underperforming and have potential in price to reflect the true intrinsic value, however, financially profitable and operationally stronger than peers in the industry. Moreover, target firms are highly leveraged and hold liquid assets compared to matching firms. Previously documented studies, including [Brav et al. \(2008\)](#); [Boyson and Mooradian \(2011\)](#) report firms with less market capitalization and value stock highly likely prone to the fund activism.

Activist targets a firm with a pre-specified plan of actions. When a fund exceeds a threshold of 5% or more ownership stake in a firm, it reports a mandatory file known as Schedule 13D to the Securities and Exchange Commission of the US. In 13D notification, it identifies undervaluation and explicitly proposes potential changes to the firm. Targets have been experiencing positive and constructive support from activists during the activism. The funds' interventions are positively perceived by the market, and as a result, market appreciates the stock price in the short-run. The empirical findings of our study are consistent with the prior literature on documenting the short-run value creation around the announcement window. We find that in the short-run, target firms' cumulative abnormal returns around the longest (-20, +5) event window, exhibit 5.34% appreciation in stock returns, which is in line with prior documented studies on fund activism.

We examine the market reaction to various types of activism and analyze the cross-section of short-run abnormal returns. We find that market appreciates most the intervention by an activist suggesting changes to the capital structure in a target. The announcement-related returns (12.2%) accrue to activism in which a fund initially proposes to reduce the firm's excess cash in order to mitigate the agency-related issues or repurchases of outstanding stocks and restructuring of the debts. This finding is consistent with the crisis period and suggests potential in targeting financially depressed firms. Following restructuring capital in firms, funds who manifest to change the target firms' business course, including operational efficiency or to gain favorable terms for mergers and acquisitions, manage to earn 9.2% returns in excess of the matching peers. In addition to these propositions, fund filing 13D announcement without a pre-specifying plan are rewarded by 2.8% returns, which indicates that without any preemptive measure, yet market considers the activist involvement as a positive signal for the target. We do not find a meaningful reaction of the market to the type of activism which relates to the sale of the target. In the wake of the financial crisis, spinning off some noncore asset or whole firm is seen as the norm for fund activism; however, we do not find any statistically

significant impact for such activity. The type of activism associated with governance issues, including ousting existing CEO or restructuring BOD, generates positive returns. However, we find once again a lack of statistical significance. In sum, the market responds more to funds' pre-specified plan as compared to non-confrontational approaches.

Since the financial crisis, the business-related activism promises the highest returns, approximately 15% which is statistically significant at 5% level. Funds, intervening in target's business by suggesting measures to improve operational efficiency which may include restructuring of business or recommending appropriate terms for anticipated mergers and acquisitions during the crisis, generate most returns. Another notable finding is a positive market reaction to the activist's involvement in financially depressed firms, which appears common notion during the crisis. In cases where activists target firms which have filed their cases in bankruptcy courts under Chapter 11 during the crisis period, appeared potential venue to generate approximately 10% abnormal returns, however merely marginally significant. In a relatively short-period (-10, +10) event window, funds without any intent of serving active role earn more than 9% which is highly significant. Unlike previously gained results, we do not find any statistical significance for the abnormal returns for capital structure-related activism.

While analyzing the long-term one-year performance of the target firms, we use two distinctive approaches including propensity score matching and difference-in-difference approach on both dimensions- time-series and cross-sectional settings. The initial findings for entire sample period suggest that targets outperform their matching firms in terms of valuation, profitability, and in prospects of investment. One year after activism, targets experience substantial improvement in Tobin's Q and this increase is also evidenced by the book-to-market value for which the difference in median observation is statistically distinguishable from zero. We also find that targets partly reduced their leverage. These findings are consistent with the documented literature and support the view that fund suggested measures in targets lead the stock price to reflect its fundamentals and thus help to enhance the firm value in long-term.

The targets long-term performance yield mixed results when we account for crisis effect in our analysis. Using difference-in-difference approach, we examine the crisis impact on firm's performance for the entire sample and a subsample of targeted firms during 2006 and 2007. For full sample analysis, we find that targets on average experience significant increase in measures used for size, valuation, and investment. However,

following the crisis, targets suffer in terms of profit margin coupled with an increase in debt capacity. For a subsample of firms targeted during 2006 and 2007, the two years long-term performance in 2008 and 2009 demonstrate that firms experience on the average increase in profitability and investment in the first year following the fund activism. However, in the second year of activism, we observe significant fall in dividend yield and investment.

The study contributes to the existing literature on several fronts. It primarily addresses the fundamental question of the impact of hedge fund's activism on the target firm's performance and attempts to explore whether activism strategies as well as their effect changes following the financial crisis of 2007–2008. There has been a growing literature on the fund activism in the recent decades, including [Brav et al. \(2008\)](#); [Clifford \(2008\)](#); [Klein and Zur \(2006\)](#); [Becht et al. \(2010\)](#); [Boyson and Mooradian \(2011\)](#); [Bebchuk et al. \(2014\)](#), evaluating the impact of activist's proactive role in targets' short-term and long-term performance. However, these studies examine merely pre-crisis period (except ([Bebchuk et al., 2014](#))), when markets were normal, and fund activism was widely appreciated. Since the recent financial crisis might have changed the traditional approach to activism, it would be persuading to reexamine the patterns of targeting the firms and analyzing the cross-sectional distribution of returns to different types of activism.

Prior studies on fund activism generally characterize a firm selection as a random procedure ([Brav et al., 2008](#)). The empirical research, however, rather suggests that targeted firms are typically financially and operationally strong with excess cash. Hence, critics raise a fundamental question on targets post-activism performance, and argue that target's better performance be arguably subject to fund good stock picking rather than fund activism. Contrary to this view, this study counterintuitively argues that firms are targeted nonrandomly based on certain observable features, thus, highlights the inherent issue of selection bias. Previously documented studies have deliberately overlooked it. Our analysis of firms' characteristics in the year before activism evidently supports this argument suggesting that activists' target firms are small-sized, cash-rich, profitable and highly paying out compared to their matching firms. Thus, to mitigate the potential issue of endogeneity occurring because of possible sample selection bias, we use propensity score methodology. Using matching approach, we compare each target with controlling firm and estimate the probability of being selected for activism.



In addition, activism-related studies have been analyzing a limited sample period. [Brav et al. \(2008\)](#) consider five-year sample from 2001 to 2006, and [Klein and Zur \(2006\)](#) use sample from 2003 to 2005. Contrary to them, however, [Boyson and Mooradian \(2011\)](#) analyze relatively a longer data set covering a period of twelve years between 1994 to 2006. In a recent study, [Bebchuk et al. \(2014\)](#) use a sample starting from 1994 to 2007, adding some observations from the crisis period, to analyze the long-term impact of fund-activism. It is important to note that hedge fund industry has witnessed a surge in the early 2000s, and in particular in the post-crisis period, allowing a broader frame to obtain insights. Leading in this aspect, this study considers relatively a longer panel from January 2000 to December 2013. A large sample frame permits to analyze two important elements: first, to examine the strategic patterns of targeting, which might have evolved over the activism period, particularly following the crisis, and second, a comparative analysis in pre- and post-crisis period with well-diversified additional observations.

In evaluating the target firms' performance, prior literature commonly reports the criteria of industry classification, size, and book-to-market value. The documented studies have benefited from Fama-French sorted portfolios based on two-digit SIC codes, 5 x 5 size, and book-to-market value ([Klein and Zur, 2006](#); [Brav et al., 2008](#); [Boyson and Mooradian, 2011](#)). In an exceptional case, [Klein and Zur \(2006\)](#), alternatively, use a sample comprised of firms targeted for activism by non-hedge funds. We share a common feature with previous studies and use two-digit SIC codes, Fama-French 25 size, and book-to-market portfolios to evaluate the short-run performance of returns. However, in addition to Fama-French sorted portfolios as a matching criterion, we adopt a distinctive approach. We extract firms from Schedule 13G filed by the similar set of hedge funds to use as a matched sample. It primarily allows us to gain insights into the activist's strategic choice of targeting a firm, and predictable potential about the future outcomes associated with the activism. Moreover, the differential effect in the market reaction explains the trajectory how the market perceives the presence of activist in an active target vis--vis passive target.

The rest of the paper proceeds in the following way: Section 2 discusses the formation of the sample. In section 3 presents the summary statistics on fund tactics and the targets' characteristics. Section 4 presents the analysis of the short-run returns around 13D filing in the overall sample in general and compares it with crisis period. Section 5 analyzes the long-term performance of targets for full sample period and relates it to prior documented studies. Section 6 examines the impact of the recent financial crisis

on accounting performance of target firms in the long term. Section 7 using different specifications analyzes the sensitivity of the results, and section 8 concludes the paper.

## 2 Data collection and variable construction

### 2.1 Hedge fund sample

Primarily, a sample of 200 hedge funds is obtained upon request from Barclayhedge.com (private) database with assets under management (AUM-hereafter) and net monthly returns. Of this, funds functioning only in the U.S. are chosen. At next stage, the funds investing in equities under various categories including global macro, global, event-driven, market-driven among others are shortlisted. To this sample, we add more funds found in hedge fund literature and on related websites. A list of at least 500 randomly chosen funds is assembled. To this extent, the details about fund holdings (AUM) and acquired stakes in firms are unknown. To make it further diversified and well-balanced sample, we perform a search test in the Securities and Exchange Commission's EDGAR search file with the first name of the fund in our list and retrieve additional funds. This process helps in to add more funds to the list which precisely marks about 800 activist hedge funds. From these 800 funds, we drop a large number of funds functioning as arbitrageurs or taking positions for short period trading purposes. The process of scrutiny leaves our initial activist sample to 127 funds involved in activism. To avoid any possible selection bias, we choose funds regardless of their characteristics e.g. fund size (AUM), previous filing record, performance, and characteristics of fund managers.

At next stage, each fund is searched in EDGAR system for its record from January 2000 to December 2013. Funds usually report several mandatory files during the period, they operate. When a hedge fund acquires 5% or more ownership stake in a publicly listed firm showing intent to intervene in the business course of a firm, it is officially required to report the 13D Schedule within ten days to the Securities and Exchange Commission (SEC henceforth) of the U.S. under the 'Securities Exchange Act of 1934.'<sup>3</sup>

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<sup>3</sup>The Schedule 13G is a mandatory disclosure statement for the persons subject to Section 13(g). The qualified institutional investor is required to meet two core elements. First, the institution must have acquired the ownership stake in an ordinary course of business and not with the purpose of influencing the control of issuing authority. Second, the issuing authority must belong to a specific regulatory institution e.g. bank, insurance firms, saving association under Federal Act, registered investment bank among others. The filer (qualified institutional investor) of 13G Filing is required to report within 45 days of the end of calendar year in which the beneficial owner holds more than 5% or within ten days of

The Schedule 13D indicates the filer as an activist and provides the details about filer's name, the issuer name and identity as an asset class (bank, money manager), the number of total shares outstanding, and form (ordinary vs. preferred stock), payment methods and related costs, the purpose of transaction, filer holdings in total outstanding shares, and other necessary documentation in the course of transaction's proceedings.<sup>4</sup>

The Schedule 13D discloses essential information about filer's identity. Item 2 entitled as "Identity and Background" describes the reporting person's business address and type, record about filer's, if any, criminal and civil proceedings in last five years. However, it does not mention clearly the filer's type whether it is hedge fund or non-hedge fund. Thus, to clarify any doubts about fund's identification and position, we examine thoroughly each fund's personal webpage and verify it with Factiva and other related websites. During this systematic search process, some funds are found offering services simultaneously for hedge funds as well as for private equity funds. We trace the parent investment companies which manage these funds and check for their identification. If the filer is found non-hedge fund, we simply exclude it. To give an example from the list of activist funds, Deephaven Capital Management LLC, which manages hedge funds and invests in fixed income securities and in private equity funds. To make sure whether it is an activist hedge fund, we check its website and record on past transactions in SEC to confirm its identification.

Using EDGAR's system to retrieve 13D filings could bias the sample toward big funds and small firms. In an attempt to acquire a meaningful stake in a firm to employ activism, a fund is required to invest a substantial part of holding capital. However, some activist funds have involved in target firms with ownership stake less than 5%, thus do not appear in EDGAR's system. For example, in a recent period, Sandell Asset Management after acquiring merely 2% stake in JDS Uniphase Corp. (operating in networks and optical products), urged the target to consider a proposal of divesting some subsidiary assets. Following this suggestion, JDS announced its plan by stating "This is a strategy our board has been actively considering for some time, ..." The effectiveness of proposal in a short period is manifested by fund's reputation and its active role in another firm namely Bob Evan Farms Inc., where it acquired four board seats and urged the firm to spin-off particular assets.<sup>5</sup> These events account for a significant portion

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the end of the calendar year in which filer holds more than 10% ownership stake.

<sup>4</sup>Schedule 13D and other filings can easily be downloaded through EDGAR filings search on [1]www.sec.gov.

<sup>5</sup>[1]http://blogs.wsj.com/moneybeat/2014/09/10/activist-sandell-urged-jds-to-explore

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of the fund-activism. We gather information about such events using various sources including financial press and related websites.<sup>6</sup>

Activist funds file initial Schedule 13D and then report frequently changes to it which are known as amended file (13D/A). In some cases, these amended files are not reported after the first announcement to the EDGAR's system. The amended files exhibit the developments on fund activism during a specific period. In addition, these amended files signal the period, the fund stays in the firm (in the later part of analysis, these amended files are well explained). A notable example is Del Mar Asset Management, LP when it acquired 4.38% stake in Kennedy-Wilson Holdings, Inc. and announced 13D Filing on November 16, 2009. However, EDGAR's system does not report amendments following the initial filing. Thus, all such cases are not considered.

A structurally well-defined procedure of multiple cross-checking and scrutinization leaves the sample with 112 U.S. hedge funds demonstrating the average characteristics of the industry. In comparison with seminal study by [Brav et al. \(2008\)](#) who analyze 236 activist hedge funds over the period of 2001 to 2006, this study investigates 13D Disclosers filed by 112 activist funds for a wide period starting from January 2000 to December 2013. Our sample composition in terms of activists' distribution resembles to [Boyson and Mooradian \(2011\)](#) study who investigate 111 activist hedge funds owned by 89 hedge fund management firms over the period of 1994 to 2005.<sup>7</sup> Table ?? presents the distribution of the activist funds over the period of 2000–2013. An overview of the sample depicts the monotonic trend. The number of activist funds on average do not vary from 2002 to 2005, however, just before crisis and in following years, an increasing trend is observed. Table 3 provides details about activist funds and their targets. Out of 760 fund and firm pairs (repeated in some cases), we have 688 firms uniquely targeted by 112 funds. On average, each activist fund targets six firms over the sample period.

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tions/?KEYWORDS=hedge+fund+2+equity+stake.

<sup>6</sup> Important criticism is drawn on activist's successful campaign by seeking insights to know how activists systematically gain board seats or influence firm to implement their suggested plan by holding even less than 5% ownership stake. To gain insights into this puzzle, activists normally propose their agenda to inclined but reluctant large shareholders including pension funds, mutual funds, private equity funds, and more possibly with other hedge funds with whom they can find common grounds. Activists lead the campaign on behalf of other institutional shareholders by dividing the monitoring cost proportionately. [1]<http://business.financialpost.com/2014/11/15/how-activist-hedge-funds-on-steroids-have-become-a-boardroom-enemy/>

<sup>7</sup>How well our sample is diversified and representative of the industry? According to global research firm Preqin [1]<https://www.preqin.com/>, currently more than 400 activist hedge funds functioning worldwide. Of these 400 active funds, 60% are US based thus comprising 240 funds from which we assemble our sample with 112 activist funds (47%).

However, some funds exceptionally (e.g. Harbinger Capital Partners Master Fund, Carl Icahn C, Jana Partners LLC, and VP Partners LLC, among others) engage in, on average, more than 20 firms in sample period which demonstrate their wide activist role.

## 2.2 Target firms sample

For a comprehensive list of 760 Schedule 13D events with the announcement dates, we retrieve 688 firms which are uniquely targeted by 112 activist hedge funds over the period of January 2000 to December 2013. For about 9% cases (760–688), some firms are repeatedly targeted in similar months, therefore, to avoid repetition in analyses, we drop the firm occurring twice. However, we strictly consider the purpose of a transaction for which a firm is targeted. At next stage, these firms are searched into the Thomson Reuters Datastream for their DS Mnemonic Codes (identification codes). During the search process, about 20% firms do not appear in Datastream. Thus, we drop them from our sample. Our well-defined search process shortlists 551 U.S. firms, finally. These firms are publicly traded at *NYSE/AMEX/NASDAQ* exchanges.

For a sample of 551 target firms, we extract data on their stock prices and for accounting figures from their balance sheets, income and cash flow statements, respectively. Stock prices are daily based and start prior to January 2000 to December 2013. Table ?? provides in details the definition of variables used in the analysis.

Of these 551 firms, a large number of target firms (about 36%) are reported as either dead or completely buyout, merged, or delisted from Datastream during activism. Given that, the database does not explain any reason for disappearing firms. The missing annual accounting figures account for approximately 20% of entire sample. However, these caveats have been noticed by previous studies. Among others, [Greenwood and Schor \(2009\)](#) reduce their sample size approximately half to the firms available in Compustat but find it upward biased to small firms.

During the course of activism, a hedge fund keeps on following with the target firm and files several amendments known as 13D/As. These amended files reveal the fund's consideration about the target contemporary performance and its strategic plans regarding future policies. In the majority of these cases, a fund demands merely a formal communication for investment purpose, however, sometimes, it recommends an entire

change in the course of actions including displacement of CEO, board management, making or blocking new mergers and acquisitions (*M&As*), corporate and governance matters. In order not to miss any important information, I go through these amended files in particular and gather all theoretical information on relevant items. In case of a significant change to the previously submitted purpose of the transaction (e.g., if a fund initially purchases the stock for portfolio investment by having no intention of playing an active role at managerial level and later on alters it by participating in corporate activities as an aggressive/hostile investor) then this amended file would be considered as a separate case. However, earlier studies report that these follow-up events do not affect the significance of the overall results (see, e.g., (Greenwood and Schor, 2009)). In this sample, 3500 amended files out of total 4260 (6 amendments per initial announcement) constitute about 80% of the total sample.

### 2.3 Matching firms sample

As discussed in the section 2.1 that when an investor or activist acquires 5% or more ownership stake and explicitly reveals interest not to influence the control of firm, then it is mandatory for the acquirer to report Schedule 13G within 45 days at the end of calendar year in which the investor holds ownership. In the case of holding 10% or more stake, the duration to file 13G Announcement restricts to 10 days at the end of calendar year. We experience that an activist also acquires a firm for a longer period with nonactive purpose by filing 13G to the SEC. This intuitively motivates to a comparative analysis and raise the question to investigate whether firms actively-targeted perform better than non-actively targeted firms. In other words, to evaluate the performance of firms reported in 13D Schedules, we use the firms reported in 13G Announcements. We gather all reported 13G disclosures for the similar set of hedge funds for which we collect 13D files over the period of January 2000 to December 2013. From these 13G Files, we gather all relevant information including firm name, the percentage of holding to total ownership, and type of shares (common versus preferred stock). Unlike 13D Schedule, 13G Announcement is distinctively exempted from several clauses to report.<sup>8</sup>

Initially, we collect 955 firms from 112 hedge funds who report 13G Announcements over the period of January 2000 to December 2013. At next stage, we search these firms in Thomson Reuters Datastream database to retrieve their DS Mnemonic Codes

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<sup>8</sup>In some cases, funds initially report 13D Schedule to the SEC, however later on they are observed to change the status to 13G depending on investment strategy.

(Identification codes) to collect data. For a small number of firms, which constitute approximately 6% of the entire sample, however, we do not find codes, thus these firms are dropped from our sample. For the rest of 898 firms, we extract data on daily and monthly stock prices and annual accounting figures from using Datastream. All matching firms are US-based and listed at *NYSE/AMEX/NASDAQ* exchanges.

## 2.4 Crisis definition

For the analyses of daily and monthly stock returns, we divide the data into two sub-groups, for the period before crisis, it starts from January 2000 to July 2007, and for the period during and after crisis, it begins from July 2007 and lasts until December 2013. For the annual accounting analyses, the observations for the crisis begin from 2007 and onward.<sup>9</sup>

In order to evaluate stock returns, the crisis is measured by means of a dummy variable which takes value one, if Schedule 13D is filed from July 2007 and ends at 2013. In similar fashion, for accounting analyses, crisis is equal to one, if Schedule 13D is reported in the year 2007 and onward. Prior studies considering recent crisis impact have been using a similar definition (For detail, e.g., see, [Maier et al. \(2011\)](#); [Ben-David et al. \(2012\)](#); [Becht et al. \(2010\)](#)). In the sample, one-third observations fall in the period following the financial crisis.

## 2.5 Event definition

We define an event in our analysis as when an activist hedge fund acquires 5% or more ownership stake in a publicly listed firm with an intention to influence firm's internal governance by a well-stated plan of objectives. On crossing the threshold of 5%, the fund is required to report a mandatory file known as 13D Schedule to the SEC of the US within 10 days. We gather dates on these reported announcements by two ways; first,

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<sup>9</sup>The crisis in the sub-prime sector which started in early 2007 subsequently trickled down to the financial institutions including banks, holding companies, investment banks, and brokerage houses in the mid of 2007. A general consensus among academicians define the recent financial crisis period from July 2007 till December 2009. [Maier et al. \(2011\)](#) explain the definition of crisis by stating "at the end of June 2007, hedge funds of the investment bank Bear Stearns, which had invested overwhelmingly in the sub-prime mortgage market, were among the first to struggle." (see, for details, 'Bear Stearns says battered hedge funds are worth little', New York Times, July 18, 2007., [1][http://www.nytimes.com/2007/07/18/business/18bond.html?\\_r=0](http://www.nytimes.com/2007/07/18/business/18bond.html?_r=0)).

the day when a fund acquires ownership and does not disclose to the SEC (its initial holdings), in case of unavailability of first reported date, we consider the date available with the SEC.<sup>10</sup>

### 3 Summary statistics of activism-based events

#### 3.1 Hedge fund intention towards target

Table ?? exhibits the distribution of hedge funds over the period of 2000–2013. Interestingly, the number of funds does not vary significantly though relatively a small degree of spike is observed in the closing years of financial crisis.

Table ?? delineates the chronological distribution of the events over the sample period. Each event represents a Schedule 13D filing whether it is several times filed by an individual fund or separately filed by different funds. An overview of the figures reveals that there is a steady growth in activism events prior to the on-setting of the financial crisis. The overwhelming majority of the events take place during early 2000 and before financial crisis which is consistent with pre-crisis events' distribution documented by [Greenwood and Schor \(2009\)](#) and [Boyson and Mooradian \(2011\)](#). A potential factor for the significant increase in activist events is well motivated by [Greenwood and Schor \(2009\)](#) by arguing that hedge funds might have replaced the role of pension and mutual funds once occupied in the 90s and early 2000s. Another reason could be the expansion of the hedge fund industry in post-2000s when the investment was comparatively better rewarded by fund-related activism. A notable downfall in the events following the crisis is attributed to the outflow of capital from hedge fund industry and prudent behaviour of the investor (for detail, see, [\(Bolliger et al., 2011\)](#)).

In Schedule 13D form, a filer provides detailed information about the transaction. Item 5 titled "Interest in the Securities of Issuer" discloses information about beneficiary entity individually as well in a group, date of the transaction, number of stocks held by each beneficiary, if it applies then share class (type A or B). Item 3 "Source and Amount of Funds or other Consideration" describes the information about the amount

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<sup>10</sup>In section 2.2, we describe in detail the procedure of gathering information on announcement dates. Since our analysis is sensitive (particularly in short-run) to the fund announcement, thus we are preferably focused on exact dates when a fund acquires stake. To do so, we match dates reported on the SEC website with the ones available in the financial press about fund's transaction. In case, a date is found in press reported earlier and mismatched with SEC; we replace it with officially reported date.



paid for purchasing the stock and sources of payment.

Table 6 summarizes the percentage of the shares held by an activist and the related cost incurred for its purchase. Out of 760 fund-firm pairs, for 733 events (more than 96%) we have details about stocks held by an activist. Mean ownership holding at initial filing is 13% which is in line with [Boyson and Mooradian \(2011\)](#) reported figure. However, quantitatively (in dollar terms) it is many times larger than theirs indicating that targets in our sample are much bigger in size. Regarding the fund's cost of purchasing stocks, the available information is limited to about 50% firms approximately. The mean cost of the transaction for the threshold of 5% or above is about 77 million dollars.

The Schedule 13D essentially provides the details about filer and target firm. Among others, the Item 4 entitled as "Purpose of Transaction," in which an acquirer explicitly discloses the objective of acquiring the stake. These stated objectives declare the intent of filer about target firm whether the firm has undervalued stock or requires to be engaged with management regarding business. Table 7 reports the theoretical information gathered from Item 4. To sort out the information, we follow partly the patterns built by [Brav et al. \(2008\)](#) into seven different categories as general undervaluation or maximization of the shareholder value, capital structure, business strategy, sale of the firm, governance matters, financial distress, bankruptcy, and arbitrage.

Consistent with prior studies ([Boyson and Mooradian, 2011](#)) on fund-activism, an overwhelming majority of cases in our sample demonstrate that activist fund target firm for a value-maximizing purpose. In two-third cases, funds identified their target as underperforming compared to its peers which contain potential to increase its market value if appropriate measures are being taken. We also notice that a fund whether it files Schedule 13D or 13G always starts participating in the target firm by engaging with management with a central goal of value maximization.

A considerable majority of the cases exhibits that activists view the target current business strategy flawed and operationally inefficient, illustrated by an approximately 16 percent of the transaction purposes. A business course might involve restructuring, spinning off some noncore assets, blocking mergers and acquisitions or negotiating for better terms of a deal and alike. A reasonable proportion of events (11%) demonstrates that funds are concerned over poor corporate governance in target companies. Acquiring a meaningful stake (5% or more) in the target firm empowers the activist to get represen-

tation on the board and to influence the managerial decisions. Prior studies ((Brav et al., 2008; Greenwood and Schor, 2009; Boyson and Mooradian, 2011) provide a fair amount of anecdotal evidence from industry. The aggregate of all events classified in table 7 exceeds the total reported events is because of non-mutually exclusively stated goals of the funds. Activists normally suggest multiple changes in targets simultaneously, for instance, an activist can involve in ousting CEO along with spinning off some auxiliary asset. Thus, in such cases, each statement is placed in a different type of activism.

### 3.2 Hedge fund techniques to influence the target

In this section, we collect and compile the information about fund techniques by which it intends to influence the targets at the initial level of activism. We order these tactics, according to the course of actions. The tactics are 1): The hedge fund conducts preliminary meetings on a regular basis with the target's management to get involved with the ongoing business activities. About half of the cases reveal that funds begin actively by negotiating with the management (53.6%). 2): A considerable majority of funds seeks to get board representation (12.25%). 3): A small number of funds plan to appoint board nominees (2.24%). 4): The funds intend to prevent the target to make any unfavorable decision regarding shares repurchase at a discount (2.24%). 5): Hedge funds ask the target to change the course of business on the proposal of shareholders (8.56%). 6): Funds performing individually, if unsuccessful, then seek the collaboration with other institutions or blockholders (5.40%). 7): Fund threats, confronts, or compels to restructure the target's regular course of business (9.09%). 8): Fund individually or in a group, plan to have a proxy contest against target's merger or acquisition for better negotiation (4.08%). 9): Fund legally sues the company in bankruptcy court (2.24%). 10): Fund completely buys out the firm or merge it with another target firm (1.58%).

### 3.3 Characteristics of target firms

Prior literature on fund-related activism argues that fewer regulatory bindings, acquiring a concentrated stake, and using complicated nexus of investment strategies allows a fund to assert its influence in mitigating the agency issues associated with managerial discretion (Bratton, 2006; Kahan and Rock, 2007). To do so, what kind of firms, activists target? The activist funds preferably target companies having prospects in terms of returns and financial performance. Also, a target selection is subject to a fund's predetermined period of holding a stake in a target, lock-up period, fund and firm operational and financial characteristics. In this section, we investigate the fundamental question of

interest, what kind of firms do hedge funds target for activism?

Following prior activism-related literature (Brav et al., 2008; Boyson and Mooradian, 2011), we adopt two distinctive approaches to evaluate the characteristics of target firms and compare with a sample of matching firms in the year before activism. First, we compare the target firms with their peers based on size, book-to-market value, and industry classification. Initially, we sort out all target and non-target firms on 2-digit SIC industry codes. The non-target firms, which do not match with target firms on 2-digit industry codes are dropped from the sample. For each target firm, at least one matching firm is found. At next stage, we choose the non-target firms whose market value of equity fall between 70% to 130% of market-value of the target firm a month before being included in the sample. All target and non-target firms with missing observations are dropped. Finally, we compare the non-target firms with book-to-market closest to the book-to-market value of event-firms. A continuous procedure of matching and scrutinizing reduces the sample considerably (by 52%).

Table 9 exhibits the summary statistics of the characteristics of the target companies in the year before activism. We report mean, median, and standard deviation of both target and matching sample firms. To mitigate any non-normality which may arise because of an outlier in variables, we follow the prior fund-related literature (Boyson and Mooradian, 2011) and winsorize all variables at the threshold of 1%. The last two columns report the Wilcoxon signed-rank test for the difference in the medians between targets and matching sample firms. All figures are annual and retrieved from using Datastream. We compute the essential list of ratios including proxies for firm size, operating, financial performance, debt capacities, profitability, investment, and valuation.<sup>11</sup>

To demonstrate the significance of average differences in the characteristics of the target and matching sample firms, we report the difference in medians. Brav et al. (2008) motivate the use of median difference by arguing that Wilcoxon sign-rank test exhibits asymptotically normal distribution and provides better statistic in situations when variables largely display fat tails in their distributions. Column 8 reports the p-values for the difference in medians.

Starting with the firm size, proxied by market capitalization, the median difference between the target and matching sample is approximately negative 13 million dollars,

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<sup>11</sup>For the definitions and computation of ratios, table 2 is provided.

which is insignificant and in line with previous studies reporting hedge fund's target being small-sized. To look into the details, we gather qualitative information from 13D Filings (section 5 & 6), on firm transaction size and total outstanding shares. On average (median), a fund holds 46.1 (9) million shares in a firm, which constitutes a mean (median) percentage of 13.3 (7.75%). The incurred cost of these transactions is on average (median) 77.7 (16.1) million dollars. Thus, this information provides enough evidence to the typical notion of a fund acquiring a substantial stake in the target by spending a significant amount of its portfolio capital. However, it is also consistent with the idea that hedge funds normally do not target big firms, for which they need to spend a large part of their capital. [Brav et al. \(2008\)](#) argue that acquiring a significant size in a large firm may induce the idiosyncratic portfolio risk for the fund.

Regarding firm valuation measured by Tobin's Q (long-term debt + the market value of equity / long term debt + the book value of equity) is significantly higher than the matching sample firm by 0.78 points at 1%. In an unreported result, the book-to-market ratio (book value of equity / market value of equity) is positive and exceeds the matching firm by 0.02 points and significant at 5%. These values clearly demonstrate that undervalued stock is more prone to fund activism. Evidently, about 60% of funds stated explicitly in Schedule 13D 'Purpose of Transaction' that the targets are undervalued.

Related to firms' operational performance scaled at sales growth, return on assets, and profitability is strongly consistent with the previously documented figures. Discussing return on assets, which is much higher for the target (0.029) as compared to matching firm (-0.010) and differentiate from zero significantly. To obtain more evidence from other measures, we examine the (sales) growth in target firms. Surprisingly, the target firms outperform the matching firm by 0.03 points which is significant too at 5%. These results are in contrast with [Brav et al. \(2008\)](#); [Boyson and Mooradian \(2011\)](#), who document negatively significant difference in medians. Return on assets and growth coupled with profitability might explain the entire pre-activism targets performance. To assess the ex-ante target's profitability (measured as net income / net sales or revenues), we find that difference in medians is approximately 0.03 points which is marginally different from zero. In a nutshell, targets' operational performance portrays them attractive for fund activism.

In terms of debt capacities, the book leverage of target (matching) (defined as debt / (debt + book value of equity)), leverage (total debts / total equity), and market leverage

(expressed as debt / debt plus + market value of equity) are 0.29 (0.77), 0.27 (0.16), and 0.19 (0.06) respectively and distinguishable from zero at 1%, 10% and 1% respectively. Except for book leverage, all other measures exhibit higher ratios than matching firms, consistent with the increasing trend in firms' leverage in the post-crisis period.<sup>12</sup> To look into the details, one can isolate the firms targeted in post-crisis period to examine whether the higher leverage is driven primarily by firms in ex-post crisis. These figures differ from Boyson and Mooradian (2011) reported numbers who find targets with lower leverage ratios compared to their peers using data from the pre - crisis period. We may attribute the difference to crisis effect. Some variation in leverage difference can be explained by Fed's new policy of quantitative easing, which led to an upsurge in firms increased borrowings. Summarizing the firms' debt burden, the targets are relatively leveraged firms.

To examine whether the target firms are capital intensive and technology-centered, we assess their investment aspects. Capital expenditure (measured as a percentage of total assets) and research and development (*R&D*, measured as a percentage of total assets) are 0.01 (0.01) and 0.02 (0.01) respectively. Unlike Brav et al. (2008), the firms in our sample spend relatively more than their matching firms in industry. To explore further the sources of deriving higher capital spendings, we look into the industry classification and find that 40% of the sample is comprised of firms belonging to the manufacturing sector.

Activist funds pay particular attention to target firms' provision of liquidity and distribution policy. Target payout policy and excessive cash holding likely increases the probability of being targeted by the fund. One of the major reason among stated objectives of the fund is to distribute the excess cash in a firm. By doing so, fund achieves two goals; first, to mitigate any agency issue associated with excess cash hoarding, second, to increase the payout for its shareholders. In our analysis, the median value (0.08) for cash (percentage of assets) in target firms is lower and significantly different than the median value (0.21) of matching firms, implying the low level of cash in targets. These findings are in contrast with previously documented studies (Boyson and Mooradian, 2011), who find matching firms, on average, hoard more cash than targets. Related to cash distribution in terms of payout policy, the median observations for both samples are zero. However, alternatively, we compute the test in a difference in averages. The dividend yield for target firms significantly differs from matching firms at 1%.

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<sup>12</sup>See e.g. R. Vincent. Leverage ratio surges at large companies. CFO.com, April 10, 2013.

To examine the impact of the crisis on the activist’s behavior of targeting pattern, we analyze the characteristics of firms targeted in the year 2007 and onward. Table 11 presents summary statistics including mean, median, and standard deviation for targets and matching firms for five years from 2007 to 2013. In comparison with the table 9 which provides summary results for the entire period, some results are interesting.

A significant trend which evidently emerges from the crisis period is, that activists less likely target highly leveraged firms. Our three measures of debt capacities, book leverage, leverage, and market leverage are no more significant (except ML which is marginally significant at 10%) in comparison with results exhibited in table 9 for the full sample period.

Summarizing the characteristics of the target companies by a set of conventionally defined ratios, we demonstrate in our sample, that the activists target relatively small-sized, undervalued and financially profitable firms. Our findings also hold with the prior documented studies which find that target firms are usually highly leveraged, investment oriented with good distribution policy.

### **3.4 Likelihood of fund–activism**

#### **3.4.1 Sample selection bias**

In section 3.3, the characteristics of target firms are compared with those of matching sample firms to examine the targets’ performance in the year prior to fund activism. By analyzing the target’s features, we attempt to show whether differential effects between a target and a nontarget might explain some potential reasons for a firm to be targeted for activism. However, critics raise fundamental question on fund choice and argue that an activist likely targets a firm which is financially strong, well-performing and has potential to reflect its intrinsic value if firm’s fundamentals are aligned. Thus, target’s outperformance in post-activism period remains controversial and not credited to the fund activism rather subjects to the activist good choice.<sup>13</sup> It raises an underlying issue of sample selection bias primarily occurring because of nonrandomness of targeting patterns and selection on observable covariates. Prior literature in fund activism has

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<sup>13</sup>To counter the argument of fund cherry-picking stock; we thoroughly examine the fund suggested measures and subsequent actions in targets to see the real impacts of fund activism on firm’s performance.

paid relatively less attention to this potential issue.<sup>14</sup> Apparently, it appears due to the choice-based sampling, in which an activist fund chooses a potential target and not because the analyst (see, e.g., Heckman (1979)).<sup>15</sup>

Given the nonrandom selectivity, the probability of being selected for fund activism could be discussed using propensity score approach which has gained considerable attention in recent decades (Rosenbaum and Rubin (1983); Heckman and Navarro-Lozano (2004); Heckman and Vytlačil (2007); Coffee and Palia (2014)). Heckman and Todd (2009) propose for propensity score methodology in a setting (experimental studies) where members of the treatment group are over or under-represented about their frequency in the population. As discussed in section 2.1 that our analysis includes likely those cases in which an activist files Schedule 13D (acquires  $\geq 5\%$ ) and ignores all such potential cases, where activism takes place with less than 5%, thus considers the treatment group under-representing the total population and fits to the setting to use propensity score methodology.<sup>16</sup>

In this section, we use propensity score approach to a setting where we conjecture that firms are targeted on some observable characteristics for activism. Rosenbaum and Rubin (1983); Imbens and Wooldridge (2009) propose matching sample strategy to encounter confoundedness.<sup>17</sup> It primarily allows to obtain the uniform distributions of target firms with matching sample firms, and thus helps yield possible unbiased estimates. We begin to construct a vector of common characteristics in which we match

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<sup>14</sup>Recently in a critical study on fund activism, Coffee and Palia (2014) highlighted this issue by raising serious concerns over formation of matching sample in evaluating activist performance.

<sup>15</sup>Heckman and Navarro-Lozano (2004) model this issue as an economic choice by considering two potential outcomes ( $Y_0, Y_1$ ).  $\delta = 1$  if  $Y_1$  is selected and  $\delta = 0$  if  $Y_0$  is selected. Activists pick their respective outcome based on utility maximization (which would be treatment effect in the case of choosing good target firms). Let  $V$  be utility which is formulated as:

$$V = \mu_V(Z, U_V) \quad D = 1(V > 0)$$

Where  $Z$  is a vector of factors (observed by the analyst),  $U_V$  are the unobserved (by the analyst) factors and determine choices, and 1 is an indicator function. Our emphasis is on two different information sets — information set which an activist has and basis on certain observables— information set which an analyst has and is restrained with information about activist’s choices.

Another reason for not likely considering the issue of selection bias in previous fund-related studies could be that researchers manually construct sample and thus presumably avoid any non-random sampling errors (see, e.g., the seminal study of Brav et al. (2008)).

<sup>16</sup>In later analysis, we introduce model to examine the causal effects of fund activism on target firms.

<sup>17</sup>In popular term, this strategy is known as nearest neighbour (NN) matching, based on treatment probabilities. The attractive feature for which Caliendo and Kopeinig (2008); Imbens and Wooldridge (2009) argue is that it initially helps reduce bias rather than variance in estimates.

the targets with controlling firms to assess the probability of a firm to be a potential target. Prior literature on propensity score matching suggests using all concerned variables which may affect both treatment selection and the outcome (Austin et al., 2007). Thus, we include all possible characteristics which might explain the probability of a firm selection. At next stage, using a logit regression model upon multivariates in lagged period, we examine the probability of each covariate in explaining the variation in firm selection.<sup>18</sup> In addition, we show too whether our results show persistency with those obtained from nonparametric analysis in section 3.3.

Table 10 exhibits the effects of covariates on the likelihood of fund activism. We compare the sample of target 551 firms with nontarget 898 firms based on propensity score matching.<sup>19</sup> Using a logit regression setting, the dependent variable being dummy set to 1, if a firm is targeted in the year before activism. The independent variables include a vector of firm salient features. The results are presented. To control for fixed effects, we include industry and year dummies. All variables are winsorized at 1%.

Table 10 reports the coefficients of the multivariate regression model results. We discuss some interesting results. The market capitalization (in natural logarithm) is distinguishable from zero and provides some explanation for the variation in fund decision whether to target the firm for activism. In table 9, a fund choice of targeting firm for activism has also been discussed using a non-parametric test. Fund essentially takes into account the size of a firm and uses the mode of activism which might affect the firm governance in the immediate future.

Firm valuation parameter, Tobin’s  $Q$ , is consistent with the result presented in section 3.3 and is in line with prior documented findings (e.g., (Brav et al., 2008; Boyson and Mooradian, 2011)). The coefficient on Tobin’s  $Q$  is negatively significant at the level of 5%. We interpret it as one standard deviation decrease in Tobin’s  $Q$  is associated with 0.55 percentage points increase in the probability of a firm being targeted by an activist.

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<sup>18</sup>In principle, any discrete model can be used to estimate the propensity score. The preference for logit or probit models is highly derived from the unlikeliness of the functional form when the response variable is highly skewed and predictions are outside the  $[0, 1]$  bounds of probabilities (e.g., see, Smith (1997)). For binary treatment cases, where we estimate the probability of target vs. nontarget — logit or probit models yield almost similar results, however, Caliendo and Kopeinig (2008) argue for logit model since it demonstrates more density mass in the bounds.

<sup>19</sup>Alternatively, we can match each target firm with nontarget based on market value, book-to-market ratio, and 2-digit *SIC* codes.



Regarding firms' debt capacities, the coefficient on book leverage explains the cross-sectional variation in fund's objectives when targeting a firm. For instance, one standard deviation increase in book leverage increases the probability of a firm being targeted with 0.58 points, if other things remain the same. This leaves enough potential for activists to target highly leveraged firms to generate value through restructuring their debts.

The patterns emerging from logit regression are consistent with the non-parametric analysis in section 3.3, and suggest that activists in general target small-sized, under-valued and highly leveraged firms to create value for its shareholders.<sup>20</sup>

### 3.5 Changes in targeting patterns during and after the crisis

Following the crisis, we seek whether there is any observable change in the targeting patterns of fund-activism. We go through the Schedule 13D filings mainly Item 4 to obtain information about the activist purpose of the transaction. In addition, we follow the reported development in the financial press. We emphasize on two aspects; first, following the crisis, what are those potential venues which an activist identifies for value generation? Second, given the restrained circumstances for liquidity, how does an activist manage its finances for activism?<sup>21</sup>

To examine changes in targeting patterns, we examine the event data by generating a dummy variable for the crisis, which takes a value 1 if a particular type of activism occurs during the period, starting from July 2007 to December 2013. In table 7, the event summary is decomposed for the periods before and after the crisis into two separate panels. A comparative overview of panel B and panel C depicts an even distribution of the events. To test whether a specific type of activism is exercised relatively more following the crisis, we carry out the nonparametric analysis by using Wilcoxon sign rank test for the statistical significance for a difference in medians in pre- and post-crisis period.

To begin with target's capital structure, we test whether the crisis has affected the activists' approach in targeting firm to intervene in capital structure; we find that the

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<sup>20</sup>In an auxiliary tabulated result, we find that average probability of a firm being selected for fund activism is approximately 30%.

<sup>21</sup>Since the financial crisis, a paradigm shift has been experienced in fund activism. There are certain components which are relatively more exposed to activists, for example, lack of leverage, *M&As*, governance issues. On the other hand, funds are also facing a shortage of liquidity to acquire a significant stake in firms for a long period.

median difference between events in crisis period marginally differs than the events before the crisis. For post-crisis Schedule 13D reported events, which account for 38% of the entire sample period, of them 40% cases of capital structure come from post-crisis period. This figure is economically justifiable. Since the financial crisis, the target firms experienced high leverage and constraints in financing their business, thus appeared as a potential target for activism. In addition, we also find a significant change in patterns for the activists targeting firms' internal governance during the crisis. Ousting CEOs, board reshuffling, and aligning performance-based compensation were norms of the financial crisis. For the activists, who do not intend to intervene in targets at managerial level proactively, are found distinguishably different than the pre-crisis period at 1% level. The activists intervening in targets to reform their businesses including operational efficiency, to make better deals in *M&As* show no significant difference even during the crisis.

Next, we discuss the firms' characteristics targeted during and after the financial crisis in the year before activism. Table 11 provides the results obtained from the nonparametric analysis for the firms targeted during the period from 2007 to 2013. We report mean, median, and standard deviation of both target and matching firms. The last two columns report the Wilcoxon signed-rank test for the difference in the medians between the targets and matching firms. All figures are annual and retrieved from Datastream. The table presents proxies for firm size, operating and financial performance, debt capacities, profitability, investment, and valuation.<sup>22</sup>

The target firms appear small-sized (market-cap) in the year before activism during the crisis. The difference in medians between target and nontarget is negative 3.71 million dollars, which is distinguishable from zero at 5% level of statistical significance. Regarding valuation, the difference in medians for Tobin's Q is positive, 0.85 points and significant at 1%, indicating that following the financial crisis, activists targeted valued stock. Looking at operational performance measured by net sales and sales growth, we find that nontarget firms are outperformed by target firms during and post crisis period. The median difference in net sales is approximately 163 million dollars, significant at 5%. During this period, targets' sales growth positively increased by 4%, however, the difference is not statistically significant. In addition, target firms reduced excess cash by 7% as compared to nontarget firms in the year before activism. We also find that during this period, target firms highly paid their investors by increasing dividend yield.

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<sup>22</sup>Variables are well-defined in table 2

Thus, the reduction in cash could be used to pay dividends. Target firms are relatively more leveraged in the year before activism as shown by market leverage ratio which is marginally significant at 10%.

To measure the conditional probability of each covariate in the firm selection, we compute the propensity score for each firm characteristic using logit p-score model within a year. To do so, we primarily begin our both samples for targets and nontargets from the year 2007 to 2013. Then we extract observations for firm accounting measures in lagged year before fund activism. To facilitate our matching procedure, we also include 2-digit SIC codes and year. In order to mitigate any possibility of outliers, we winsorize variables at 1% level. Of 551 target firms from 2000 to 2013, approximately half of the firms (263) fall during crisis period from 2007 to 2013. On the contrary, in nontarget firms sample, roughly about 61% firms (545) constitute the crisis period. Thus, we find at a minimum, one matching firm for each target firm.

Table 12 presents estimates on targeted firms' characteristics in comparison with non-target firms using propensity score matching during the crisis period. An overview of the results depicts that using propensity score; we possibly obtain closed matches between two samples as shown by the differences between treated and control. However, using score matching to reduce selection bias and differences may not hold for some characteristics, for instance, the difference between treated and control for ROA and R&D is exceptionally large enough to influence the treatment probability. To test the hypothesis whether target firms during the crisis do not differ (in characteristics) from matching sample firms, we use t-statistics using the pstest procedure in an untabulated result and find that target firms during crisis significantly differ from matching firms. Moreover, we also find that the average probability or propensity score for a firm to be a potential target for fund activism based on characteristics is 32%. We also observe that by excluding cash variable for which we have fewer observations in the sample, this increases to 38%. In addition, the number of exact matches also varies due to the covariates used to measure the propensity score.

## 4 Fund activism and stock returns performance

### 4.1 Short-run announcement returns for targets

To measure the immediate reaction of the market to the activist's announcement, we employ the "event-study" approach. Numerous studies have implemented this methodology to examine the effect of corporate events on a firm's stock price around the announcement days empirically. A well-developed literature begins as early as [Dolley \(1933\)](#) study of examining the effect of stock split in nominal price. In the late 1960s, the seminal studies by [Ball and Brown \(1968\)](#), and [Fama et al. \(1969\)](#) introduce improvements, which provide the foundation for today's methodology.

[Brown and Warner \(1980, 1985\)](#) investigate the issues related to the violation of statistical properties in event studies methodologies. A key issue with daily stock returns is non-normality as identified by [Fama \(1976\)](#), and as a consequence, the distribution of daily stock returns tends to fat-tailed as compared to a normal distribution. [Brown and Warner \(1985\)](#) find similar evidence in excess returns by examining the properties of a small sample. To this specific problem, [Billingsley \(1979\)](#) proposes Central Limit Theorem and argues that if the cross-sectional excess returns in securities are drawn from independent and identically distributed samples from finite variance distributions, then the distribution of mean excess returns converges to normality as the size of the sample increases. The fact that non-normality does exist in event studies, our sample size is large enough to rule out such problem.

Prior studies in fund-activism have been using event study approach to examine the effect of fund announcement on the target firm's stock price around 13D notification dates (for details, see, ([Klein and Zur, 2006](#); [Brav et al., 2008](#); [Boyson and Mooradian, 2011](#))).<sup>23</sup>

To compute the abnormal returns around the announcement days, [Fama and French \(1993\)](#) three-factor model is preferred over the returns computed from passively targeted matching firms. Two important reasons are argued; first, by matching on these three attributes, we control for systematic risk associated with stock returns and financial characteristics related to firm-type (see, e.g., [Klein and Zur \(2006\)](#)). Second, this ap-

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<sup>23</sup>In recent periods, the application of event study approach could be seen in various fields of Economics and Finance; In Financial Economics ([Brav and Gompers \(1997\)](#)), Accounting performance ([Bhagat et al. \(2001\)](#)), and Finance and Law ([Bhagat and Romano \(2002\)](#)).

proach provides a comparative analysis of our results with prior fund activism-related studies, which use equally- or value-weighted market index or portfolios to compute abnormal returns.

The use of the event study approach in fund activism is critically viewed as it contrasts with the essence of methodology, which necessarily requires the event to be unpredictable by the market. In other words, the critics argue that fund’s announcement in target firm is a likely event, which is perceived well in advance prior to the disclosure of notification date. Thus, this approach subjects to misspecification. In counter-narrative, we argue that our suggested relatively longer estimation window should induce all such information and as a result, the market reaction to the event date should be neutral. However, we show that before the fund announcement, the market behaves normally and reacts to the fund notification overwhelmingly.<sup>24</sup> In addition, it is the activist, who evaluates the target and declares the intent to intervene in firm’s ordinary course of business which is entirely independent of market assessment. Thus, the market is most likely unaware of the fund’s announcement and unanticipated course of action.

In order to prevent the event being influenced by the normal performance, we construct an estimation window of 120 days, suggested by [MacKinlay \(1997\)](#). For each target firm, we extract daily stock price 150 days prior to the event date and restrict it to 30 days before the given filing or announcement date. An estimation window of four months or  $(-150, -30)$  120 days will likely account for any nonlinearity in time-series patterns of stock returns.<sup>25</sup>

Building on the methodologies proposed by [MacKinlay \(1997\)](#); [Greenwood and Schor \(2009\)](#), we construct the initial setting as:

$$AR_{i\tau} = R_{i\tau}^{Target} - R_{\tau}^{Match} \quad (1)$$

Where  $R_{i\tau}^{Target}$  is (logarithmic) normal return on the target firm security and  $R_{\tau}^{Match}$  is the (logarithmic) return on the matching portfolio security. To compute abnormal return for each target firm, we use [Fama and French \(1993\)](#) well-constructed six valued-weighted

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<sup>24</sup>In later analysis, we show the patterns in market behavior by constructing multiple event-windows to demonstrate that as soon as the market perceives the information content, it begins to discount all factors associated with the event and reflects in firm’s stock price around the announcement days.

<sup>25</sup>In our sample, a small number of target firms (approximately 6%) do not provide an array of stock prices for 150 days before the event date for certain reasons. For such insignificant cases, we generate surrogate observations by taking the average of closest period values.

portfolios formed on size, and book-to-market value. Fama and French (1993) three-factors include High minus Low (*HML*), Small minus Big (*SMB*), and market return factor.<sup>26</sup> We subtract each announcement observation in excess of the aforementioned factors to compute abnormal returns. Then these abnormal returns are aggregated through multiple time dimensions:

$$CAR_i^{\tau_1, \tau_2} = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau} \quad (2)$$

In the next stage, we test the hypothesis whether mean cumulative abnormal returns are different from zero or alternatively fund announcement has no effect on target firm stock price. To test whether these abnormal returns are statistically significant, we use standard Z-test.

To examine the market reaction to fund’s involvement around the announcement days, we construct multiple event-windows of different sizes. Figure 1 plots mean *CARs* for targets over the longest event-window of (-20, +5) or 26 days covering pre- and post-announcement dates. The evolving pattern in returns reveals no significant movements in the early days, but as soon as market perceives the fund presence, a positive and significant response emerges from the market. Being well-informed and highly liquid, the US stock market immediately responds to fund’s transaction and reflects it in the stock price. An equally important question arises to what degree market reacts to this transaction or how much *CARs* in aggregate are fully realized. We witness a price run-up which keeps on rising sharply and as a result, there is a realization of more than 5% *CARs* for event window of (-20, +5) days. Figure 2 and figure 3 decompose the total *CARs* in pre- and post-crisis period to know which part of observations is mainly deriving positive returns. A depiction of figure 2 clearly demonstrates that pre-crisis fund announcements are well-rewarded by market long before the fund notification by generating about 7% *CARs*. However, on the contrary, in the post-crisis period, only positive *CARs* are realized merely one day before the fund notification and hardly marks 3%. These results are in line with Becht et al. (2010), who find a sharp fall in *CARs* approximately by half (10.5% - 5.8%) over the period from 2006 to 2010. They argue, the potential collapse of the takeover markets and liquidity, for the significant shortfall in abnormal returns during the crisis period.

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<sup>26</sup>Portfolios formed on size and book-to-market can easily be downloaded from [1]Fama-French website. [[http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)]

There is a general consensus over the positive response of the market to fund’s announcement. The short-run performance is consistent with prior research on fund activism. As [Brav et al. \(2008\)](#) document an aggregate of 7.2% buy-and-hold returns (*BHARs*) in excess of buy-and-hold returns on the value-weighted *NYSE/ AMEX/ NASDAQ* index over an event-window of  $(-20, +20)$  41 days. Using a long panel of firms over the period of 1994 to 2005, [Boyson and Mooradian \(2011\)](#) report 9% to 11% for filing and event date respectively. In a recent study, [Becht et al. \(2010\)](#) analyze the market response to fund disclosure and report that for a relatively longer event window of 41 days, about 6.9% abnormal returns are generated. In contrast with the positive response, an early study by [Klein and Zur \(2006\)](#) documents some mixed findings. Their reported figures suggest an array of different ranges of *CARs* from 5.0% to 10.3% over multiple period event-windows when abnormal returns are computed using the market index. However, when event firms are matched on industry/size/book-to-market, the size-adjusted mean returns are negatively significant.

To identify the early  $-10$  days  $[-20, -10]$  effect, we break-up the event window to  $[-10, +5]$  days to capture the close impact of 13D filing on stock prices. Interestingly, there is no significant change to *CARs*. This finding suggests that the market has realized the intent of fund acquiring the firm. Thus, the information has been potentially discounted long before the fund formal notification about activism. Table ?? illustrates the various event windows and their subsequent *CARs*. While analyzing the aggregate returns for each window, it seems that a significant portion of returns accrues just before the event or announcement date. The run-up spike follows early days, which is depicted by  $(-10, +5)$  event window. A drastic change is observed in trading volume in  $(-10, +5)$  day event window generating 5.14% *CARs* in excess of the market returns, demonstrating an immediate outcome of acquiring a substantial stake in the target. However, post-announcement day scenario differs. We observe that the *CARs* reduce approximately by half in  $(0, +10)$  event window, which indicates that market has exhausted all available information about volume of transaction and activist declared purpose of targeting firm.

## 4.2 Types of activism and event–days abnormal returns

In previous analyses, enough light has been shed on how activist discloses the objective of the transaction in a Schedule 13D filing. These stated objectives are classified broadly

into two types, active versus nonactive. Activists identify potential venues for improvement in target firm’s value and specify a plan of action. We gather the qualitative information from 13D Filings Section 4 ”Purpose of Transaction” about the fund’s type of action and classify them into five widely well-defined categories partly following [Brav et al. \(2008\)](#). In this section, we examine the heterogeneity in market perceptions about fund’s particular type of activism and investigate that which type of activism generates more returns for the fund by constructing univariate settings:

$$CARs_i = \alpha_i + \beta_i Type_i + \epsilon_i \quad (3)$$

Where  $CARs_i$  present abnormal returns for firm  $i$  in aggregate manners obtained from multiple event windows, and the only explanatory variable  $Type_i$  indicates the well-defined type of activism based on fund initially stated objective. [Table 14](#) explains the cross-sectional distribution of expected  $CARs$  accruing to various types of activism.

In [table 14](#), column I to IV illustrate the regression results after regressing  $CARs$  of multiple event-windows against the types of activism. Following the prior literature ([Boyson and Mooradian, 2011](#)), the estimated coefficients would be interpreted as the market reaction to each type of activism explicitly stated in fund’s purpose of the transaction. In order to control for potential unobserved heterogeneity in returns over time, we control for the target firm size, year and industry dummies. The long-term debt is expressed as the ratio of long-term debt to the aggregate of total debt and market value of equity. The model includes dummies for General Undervaluation, Capital Structure, Business Strategy, Sale of Target, Governance. We winsorize firm size and long-term debt at 1% level.

Since the model mostly incorporates dummies, to facilitate the interpretation of the coefficients on dummy variables, we follow the practice of suppressing the intercept of the regressions as suggested in the previous fund-related literature (see, e.g., [Brav et al. \(2008\)](#); [Boyson and Mooradian \(2011\)](#)). In addition, the nondummy variables, which include the size of the target and long-term debt are demeaned and expressed in the form of deviation. As a result, the coefficients on dummies can be interpreted as the average effect of a specific group of type of activism on abnormal returns assuming that the targets demonstrate average characteristics.

[Table 14](#) presents the effects of covariates on  $CARs$  of different event windows around



the announcement of Schedule 13D. In column I, *CARs* from longest  $(-20, +5)$  event window are regressed against the activism dummies, firm size, and the long-term debt. The estimates of all dummies are positive which indicates the proportionate contribution of each type of activism in generating the mean abnormal returns. The fund proposing to change the capital structure in the target is successful in generating highest mean *CARs* of 12.2 percentage which is positively significant at 5% level. The returns to the capital structure activism are likely justified in the wake of the recent crisis in which most of the targets were financially depressed because of imbalances in the capital structure. Following returns to capital structure, activists announcing changes to target business strategy likewise restructuring or spinning off are generating a mean *CARs* of 9.2%, which distinguishes from zero at 5% significance level. Activists with no pre-specifying purpose of the transaction are rewarded the least with a mean *CARs* of 2.8% which is marginally significant in the longest  $(-20, +5)$  event window. We critically observe another pattern in returns arising from general undervaluation category, which shows that as the news of fund's notification approaches to the date of the announcement, the returns eventually increase.

Given the non-mutually exclusive nature of the types of activism, an activist can generate aggregate abnormal returns by getting involved in different kinds of activism simultaneously. A fund, for instance, may suggest its initial objective to alter the capital structure, but later on, it may propose measures to the firm's business strategy. Thus, the overall effect could cause to generate aggregate abnormal returns of 21.4% (12.2% + 9.2%). However, if these changes are proposed at the beginning of the first filing, it is less likely to identify the source to which market reacts most. In table 14 column II, *CARs* from a relatively shorter  $(-10, +5)$  event window are regressed on the set of similar explanatory variables. As a result, the magnitudes of estimates reduce considerably, nonetheless remain persistently significant. We explain this differential effect in returns arising from intervals in event-windows as a market mechanism of discounting information well before a fund formal announcement. Column III and IV explain it further by extending days in the post-announcement period and show how the coefficients on types of activism become gradually marginally significant. Summarizing the cross-section distribution of abnormal returns, we observe that the market reacts remarkably to the foreseen changes in firms' capital structure and business-related activities and reflects an immediate positive response in stock prices. On the other hand, market persistently generates abnormal returns to the announcement of funds who merely engage with the firm's management on the regular basis and do not specify a particular course of action.

These results are in line with the previously reported studies on the activism impact on returns. [Brav et al. \(2008\)](#) find that market reacts most, and generates positively significant abnormal returns of 8.54%, to the announcement of fund stating its goal to spin off a certain segment of the firm and followed by the fund with intent to engage with management without any intervention. Using relatively a longer panel, [Boyson and Mooradian \(2011\)](#) document, that the fund putting up its stated agenda as to intervene in target’s governance is highly rewarded by price appreciation with a significant *CARs* of 38.5%. The remaining activism-motives other than governance, though generate positive abnormal returns, but are not distinguishable from zero.<sup>27</sup>

In summarizing, we may conclude that in short-run market responses to the fund’s announcement and generates positive abnormal returns. We also find that market perceives each type of activism distinctly different by discounting the information it receives and reflects in target stock price. The question of generating high abnormal returns subjects to level and degree of activism. In general, the findings in this study are consistent with the previous studies on the aspect of positive abnormal returns in short-run. However, the cross-sectional variation in abnormal returns is attributed to differently composed datasets and approaches to detect them. In addition, prior studies examining the market reaction to fund activism have been using pre-crisis period, a distinguishable factor to be taken into account.

### 4.3 Crisis effect

#### 4.3.1 Abnormal returns around the announcement days in post financial crisis

To examine the crisis impact on fund activism, we revisit the model used in section 4.2 and incorporate the crisis dummy in it. In addition, we include non-dummies specifications, including the size of the firm and long-term debt. Both variables are demeaned and presented in deviation form. We regress dependent variable *CARs* on multiple event windows against dummies of activism, crisis dummy, and size of the firm. We control for industry and year fixed effects in all panels. To observe the mean effect of each type of activism, we suppress the intercept term.

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<sup>27</sup>[Klein and Zur \(2006\)](#) report *BHARs* returns for activism types, but in a slightly different way, which are significantly positive.

Table 15 reports the regression results after incorporating the crisis dummy. The coefficient on the crisis dummy is positively significant. Unlike results reported in table 14, the coefficients on stated objectives appear with mixed results (both positive and negative). However, quite surprisingly, none of the estimates is statistically significant across the event windows of multiple lengths. Our interest, however, lies in the central variable, i.e., crisis, which is positive and in part explains variation in abnormal returns. The market response to the activist’s announcement, regardless of any specific objective, is illustrated by figure 3. It indicates the real effect by reflecting the downfall in returns during the crisis period around the announcement dates.

In the next stage, we ask whether size of the target firm explains variation in the cross-section of abnormal returns during the crisis period. In addition, we also create interactive terms of crisis with types of activism to analyze the effectiveness of each type during the crisis period. In general, each coefficient on the interaction term would be interpreted as the mean effect of the crisis on each type of activism. In later analysis, we argue for the composition of these variables.

Table 16 revisits the previous model with interaction terms and reports the results for multiple event windows. The activist funds, proposing structural improvements in target’s business, earn most of abnormal returns in longest  $(-20, +5)$  event window. This result is consistent with Becht et al. (2010) findings, who report that during crisis takeovers, mergers and acquisitions appeared to be a potential source of generating value. The abnormal returns from business-related activism are competitively followed by those funds who put forward their agenda to intervene in financially depressed firms.<sup>28</sup> During the recent crisis, default of firm or fund appeared as norm and forced either voluntarily or involuntarily to be sued in courts. Given such circumstances, if fund appeared to assist and reorganize target’s business and reduce debts, then such involvement is highly appreciated from the market. However, approximately 10% *CARs* are realized merely marginally at 10% level. In relatively shorter  $(-10, +5)$  event window, coefficient on General Undervaluation becomes significant, which indicates that market is more responsive to the funds acquiring firms without any pre-specifying agenda. Funds without any specified stated goal earn more than 8% in excess of matching sample firms. This contrasts with results presented in table 14, which reports that funds serving no active

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<sup>28</sup>Chapter 11 is a legal process which allows both coordinators including firm and fund to reorganize the target business and pay the debts over time.

role are rewarded by 3.9% immediately in the short period. Interestingly, the net gain to nonactive role increases during the crisis.

By comparing the results obtained in table 16 and table 14, we observe two distinct emerging trends. First, since the financial crisis, it is more popular to invest in a financially depressed firm. Firms which experienced inadequate liquidity and operating capital to run the business are largely affected by the crisis. Activists viewed such firms potential venue which could be exploited to generate returns by appearing as collaborative force. For example, when Brookfield Retail Holdings LLC acquired General Growth Properties, Inc., it clearly stated that firm has bankrupted, and requires re-organization.

Firms which require more liquid assets and capital to run the business are mostly affected by the crisis. To improve their business direction, activists find potential to provide liquidity to restructure non-functional segments and assist firm to get on track. Contrary to this finding, we find that it is more profitable to restructure firms debts as seen in full sample period. Table 14 exhibits the highest cross-sectional returns are attributed to fund whose stated goal is to reform capital structure.

Second, regardless the crisis effect, a bulk of abnormal returns is driven by business-related activism. In full sample period, it generates more than 9% returns, which increases by 4.2 percentage points when we control for crisis effect. It indicates that business related activities which involve restructuring, bargaining for better terms in mergers and acquisitions, and focusing on growth opportunities, are more profitable across any economic situation.

Table 17 presents results for the model using full specifications of crisis and interaction terms. We regress *CARs* obtained from three different event-windows across types of activism and crisis interaction terms with and without industry fixed effects. From column (1) to (9), we find that estimates for types of activism become insignificantly negative in the period before crisis across multiple event-windows. For the firms targeted without any pre-specified stated objective, however, the effect is significantly negative without incorporating year dummies. These results are contrary to the post-crisis period. The coefficients on crisis interaction terms are insignificantly positive in models when crisis dummy is used. We drop the crisis variable, highly correlated with interactive terms, and gain results which are significantly positive. Results from various models suggest that market highly appreciates the fund announcement with stated objective of influ-

encing target’s business strategy, which is persistently pronounced without year effect. Following it, funds without the pre-specifying objective of influencing firms are highly rewarded with approximately 10% *CARs*.

These findings initially suggest that positively significant abnormal returns are primarily driven by post-crisis period despite the economic downturn and heavy losses in stock markets.

## 5 Activism and long-term performance

### 5.1 Model, notations, and analysis

The long-term impact of fund activism on target firm’s performance has been assessed using several methodologies.<sup>29</sup> In section 10 we initially established in our discussion that an activist targets a firm based on certain observables. Thus, our analysis is bounded under the assumption of unconfoundedness in which we observe some factors related to both the dependent variable and with error term (Rosenbaum and Rubin, 1983). Given this particular setting, we identify propensity score, which allows us to assess the conditional probability of a firm being selected for activism.

In this section and in what follows, we analyze the impact of fund activism on target firms in a succeeding year using propensity score matching. Initially, the standard formation of unit-level causal effect is modeled partly following Roy–Rubin model (Roy, 1951; Rubin, 1974) as:<sup>30</sup>

$$\tau_i = Y_{it1} - Y_{it0} \tag{4}$$

Where  $Y_{it1}$  is a potential outcome for firm  $i$  after receiving treatment in post-activism year 1, and  $Y_{it0}$  is a counterfactual outcome for firm  $i$  before receiving treatment in

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<sup>29</sup>Ideally, a standard *Difference – in – Difference* approach is considered a suitable mechanism to estimate the average effects in a setting where the firms are targeted randomly on unobservable characteristics (Blundell and Dias, 2009; Imbens and Wooldridge, 2009). In the simplest setting, the average gain over time in the control group is subtracted from the gain over time in the target group. Thus, in doing so, differencing helps mitigate biases in the second period on both dimensions timewise as well as cross-sectional.

<sup>30</sup>Roy – Rubin model with trivial notations has been adopted in the evaluation literature (see, Heckman and Navarro-Lozano (2004)). In this study, the generic functional form of treatment effect is presented in similar fashion.

pre-activism year 0. The potential outcome is defined as  $Y_i(D_i)$  for each firm  $i$ , where  $i = 1, 2, \dots, N$  and  $N$  represents the total population. However, we observe only one outcome for each firm  $i$ , i.e., the counterfactual outcome which is unobserved during the analysis and leading to the problem of misvaluation. To resolve this issue, [Caliendo and Kopeinig \(2008\)](#) suggest to concentrate on the average treatment effect rather than individual treatment effect  $\tau_i$ .

To assess the average effects of activism for a well-constructed sample, representing the entire population, generally two eminent estimators are used namely average treatment effect (ATE), and average treatment effect on the treated (ATT or ATET). Since we are interested in those firms which are selected on certain observables and exposed to fund activism — in addition, the targeted firms are matched with another control group which is less likely prone to activism— thus, ATT is a more relevant expression to estimate the activism impact.<sup>31</sup> The average treatment on the treated is parameterized as:

$$\tau_{ATT} = E(\tau \mid D = 1) = E[Y_1 \mid D = 1] - E[Y_0 \mid D = 1] \quad (5)$$

However, [Caliendo and Kopeinig \(2008\)](#) argue that counterfactual mean for the firms being targeted —  $E[Y_0 \mid D = 1]$  is not observed, so we need a proper substitute for it to estimate ATT. The true parameter  $\tau_{ATT}$  is only identified, if:

$$E[Y_0 \mid D = 1] - E[Y_0 \mid D = 0] \quad (6)$$

### 5.1.1 Long-term performance using propensity score matching approach

In this section, we examine the target firms performance using propensity score matching approach based on the assumption that the firms are targeted on observables.

In table 18, we regress the change in firm characteristic as a dependent variable against "Activism Dummy" with using a vector of control specifications. The coefficient on activism dummy which indicates average treatment effect after being targeted and would be interpreted as activism impact on firm's accounting performance. To control for fixed effects, we include firm size both in linear and quadratic form, industry, and year dummies. We include the observations for which we find close match in controlling sample

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<sup>31</sup>Drawing samples (target and nontarget) from similar sample of activists funds (representing sub-population) also raise serious concerns over selection — a problem of endogeneity, which will be discussed in following analysis.

firms based on propensity score.

Table 18 presents some interesting results. The coefficient on net change in cash is negatively significant at 1% level. Which initially implies that target firms substantially reduced the excess cash as compared to the year before fund activism and thus, reduced the chances of being exposed to agency issues related to holding excess cash. In addition, one-year long-term accounting performance exhibits that firms experienced overwhelmingly increased investment and improved profitability as indicated by the change in capital expenditure and profit margin variables.

In comparison with results presented in table 18 in time-series setting, we are keenly interested in long-term performance compared to matching firms. Table 19 presents the results in excess of matching sample firms one year following the activism. In doing so, we revisit the previous setting and subtract the matching firm characteristic from target firm. The net change in firm characteristic is regressed against *Activism Dummy*, and vector of control specifications. Since for each characteristic variable, the number of matches differ between target and nontarget firms, thus each regression experiences different number of observations.

While discussing the results, we find that the coefficient on activism dummy is significant for various dependent variables (change in firm characteristics). Target firms substantially improve the market value compared to matching sample firms in post-activism one year, however, only marginally significant at 10% level. Valuation, the book-to-market value is positively significant. Moreover, the targets profitability is also positively significant at 5% level. While comparing with matching firms' debt capacity in the post-activism period, target firms experience a moderate reduction in market leverage by 0.39 percentage points, which is however marginally significant.

Summarizing the results obtained from using the propensity score approach, we show that target firms experience improvement in various components which include valuation, profitability and investment both in time-series and cross-sectional analyses. These significant improvements are initially attributed to activists suggested measures in target firms.

### 5.1.2 Long-term performance using difference-in-difference approach

In section 5.1.1, we primarily assume that firms are targeted based on observable characteristics. Thus, there is a potential issue of bias sample selection. To resolve it, we evaluate the target firms' performance for full period of analysis using propensity score matching approach. In contrast with propensity score methodology, we use a standard difference-in-difference approach by relaxing the assumption that firms are selected nonrandomly. We assume that counterfactual levels for target and nontarget firms are different but time invariably remains the same and thus formulate it as:

$$E[Y_{0t1} - Y_{0t0} | D = 1] - E[Y_{0t1} - Y_{0t0} | D = 0] \quad (7)$$

Following prior documented studies on hedge fund activism (Klein and Zur, 2006; Brav et al., 2008; Greenwood and Schor, 2009; Boyson and Mooradian, 2011; Bebhuk et al., 2014), we extend the empirical evidence and test the hypothesis whether hedge fund activism actually improves the targets' performance in the long-term.

To evaluate the long-term performance of targets, we analyze the firms characteristics in one-year following the activism and compare them with matching sample firms. By doing so, our analysis provides us a comparison on two dimensions; first, we compare the results of the post-activism year with results obtained in the pre-activism year (time-series analysis), second, to compare the performance of the matching sample firms in the year following the activism (cross-sectional analysis). As a result, the improved changes may be attributed to the suggested measures by activist funds, assuming other factors remain equal.

To analyze the ex-post performance in target firms in succeeding year following activism, we adopt two approaches. In the first approach, we assemble a matching sample using a benchmark of size/book-to-market value/ 2-digit *SIC* industry code in the same year. Then compute the difference in means in pre and post-activism means, and medians for target and matching sample firms. Then, a test of differences between the change in medians is used as proposed by Boyson and Mooradian (2011). In the second approach, using time-series setting, we compare the characteristics of targets in pre and post-activism and test the difference in medians.

Table 21 presents the characteristics of targets in the year after activism and compares them with matching firms. For the events taking place in 2013 and onward, Datastream



is unable to provide data for the next fiscal year. Thus, in such cases, we drop firms from the sample. In addition to this, many firms in the first year of post-activism are either delisted, acquired, merged or simply did not produce data.<sup>32</sup> All variables are winsorized at 1%. The entire set of variables are annual and the accounting data is extracted using Datastream.

In table 21 from column I to column IV, the change in means and medians in target and nontargets are reported respectively. Column V and IV exhibit the difference in change in medians for the target firms and report the Wilcoxon signed-rank test values to demonstrate the level of significance in the difference in medians.

To assess the long-term impacts of activism on target firms' performance, we analyze firm valuation, operational performance, and profitability measures. Brav et al. (2008) argue that *ROA* and operating profit margin are reasonable measures which largely remain unaffected by nonoperational factors such as leverage and corporate taxes. Starting with the difference in medians for target firms, Tobin's *Q* has reduced only 7% as compare to 80% in matching firms, suggesting that targets have gained much appreciation in value compared to peers during activism. The net value of Tobin's *Q* in excess of matched sample is 0.73 points which is significantly different from zero at the level of 5%. This finding is strongly supported by the change in book-to-market value. Target firms improve their book-to-market value by 0.03 in contrast with 4% reduction in nontargets' value. The net value of 7% is positively significant at 1%. These results explain the funds pre-activism intentions about undervalued targets and show how successful activists are in improving the firms' value. The reason for which many targets delist following the activism is largely explained by the fact that they enhance their value, and thus, are being sold at a premium to the potential acquirer (for details, see, Greenwood and Schor (2009)).

In analyzing the targets operating profit margin and growth, the findings are interesting. Activists appear successful in sustaining the ex-ante level of profit margin in the year prior to activism. Looking at the difference in targets profitability in pre- and

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<sup>32</sup>When a fund announces 13D Filing with a pre-specified purpose, it suggests measures and asserts influence to implement its plan of actions over the course of activism. In some cases, these actions prolong and outcomes are realized in the later period. To receive all such outcomes, fund keeps on increasing its ownership and thus fully buyout the target. In this case, target goes private from public and get delisted. On the other hand, fund forces its portfolio firm A to acquire another portfolio firm B to get high premium. In these cases, database does not provide data for post-activism period.

post-period might induce the perception that the target firms marginally sustain the pre-activism profit margin. However, they have indeed, outperformed the nontargets matched at the size / book to market / 2 digit SIC industry. Decomposing the ratio ( $EBIT / \text{Net Sales}$ ) and tracking back to the change in sales, we can clearly see that difference in sales is not significantly large. Thus, this finding, evidently, supports the view that activists' targets perform much better than their peers. To extend the analysis further, we examine the comparative trends in growth in targets sales. The time-series patterns emerging from changes in growth reveal that there is a reduction of 2 percentage points following the activism. However, targets still lead their peers by 3% which is positively significant at 5% level.

On the side of investment, the capital expenditures improved substantially following the activism. On the contrary, the matching firms reduce their spendings on assets largely. In our study, a considerable portion of companies come from the manufacturing sector (36% and 33% for targets and nontargets respectively). Thus, the positive change in capital expenditures has a meaningful implication. A net effect of 4 percentage points which is positively significant at 5% level is arguably attributed to the impacts of fund activism.

Summarizing the post-activism accounting and financial performance of the targets, we may conclude that there is significant evidence that activists facilitate the poorly-performing firms in improving their long-term value. Using a set of well-defined proxies for firm's characteristics, we show that targets outperformed their peers in terms of value, profitability, and investment. These findings are contrary to one strand of literature, which documents that fund-related activism presumably extracts short-run returns on the cost of long-term value destruction. Instead, we find evidence that shareholders not only benefit in the short-run but also realize value enhancement in the long-term by the constructive participation of activists.

## 6 Long-term performance in crisis period

### 6.1 Regression analysis

#### 6.1.1 Model, notations, and analysis

In this section, we test two competing hypotheses. In the first hypothesis, we test whether and how recent financial crisis has affected the long-term performance of target firms. To examine crisis effect, we divide the sample into two distinct subgroups; in pre- and post-crisis period. For the pre-crisis period, we include firms targeted between 2000 to 2006. For the post-crisis period, we investigate firms targeted from 2007 to 2013.

Table 22 demonstrate some interesting results for time-series nonparametric analysis. We compute summary statistics for both samples before and after the crisis period. An overview of the difference in medians depicts that the crisis has substantially affected the target firms' size, profit margin, leverage, distribution, and investment. Firm's size, which is measured by various means, including market capitalization, sales, and total assets is positively significant. It necessarily implies, that size being an important factor, explains in part variation in the long-term performance.

The recent financial crisis has undoubtedly affected the profitability of target firms. The difference in medians for profit margin exhibits 4 percentage points, which is negatively significant at 1%. Moreover, profit ratio also reduces by 2% for the firms targeted during the crisis period. To examine whether crisis brings a meaningful change in firm's debt capacity; the book and market leverage values initially suggest that target firms reduce their leverage during the crisis period. However, the difference in medians is statistically insignificant. On the contrary, the leverage ratio (measured by total debt to total assets) indicates that target firms have remarkably increased their leverage following the financial crisis. To investigate the underlying factors for driving higher leverage in firms, we look at investment measures assuming that higher leverage might have used to initiate new projects. We find that target firms experience an increase in research and development and capital expenditures by 2.4 percentage points and 2% respectively, which are positively significant at 1%. Next, we examine whether the crisis has any impact on firm's distribution policy. We find that the median observations for dividend yield, for both samples, are zero before and after the crisis. Alternatively, we test the difference in means, which is negatively significant at 5%, thus, showing that target firms reduce paying dividends to shareholders following crisis period

In table 23, we evaluate the target firms' performance in excess of matching firms before and after the crisis period.<sup>33</sup> The differences in medians suggest some mixed findings. Firm size in excess of matching sample firms is larger by 1.4 percentage points which is significant at 5% level. We experience positive effect for size when measured by net revenues and assets, however, statistically insignificant.

In terms of valuation, targets outperform the nontargets in post-crisis period which is significant at 1% level. In addition, target firms find a remarkable increase in investment measured by capital expenditures in the post-crisis period. However, following the crisis, targets experience higher leverage which is strongly evidenced by the positively significant difference in medians for book leverage and leverage ratio. We also find that targets profit margin reduces in the post-crisis period, which is marginally significant at 10%. In comparison with results in table 21, the findings in this analysis partly share some commonalities. For instance, the target firms experience improvement in valuation, investment, and distribution.

To test our second hypothesis, we examine the performance of a similar set of firms, which are targeted in the pre-crisis period and remain in funds' control in next two years following the crisis. We evaluate these firms' performance in two years before and after the crisis. By doing so, we expect the 'change in performance' may allow us to attribute it to the fund activism in excess of matching firms during the crisis period. Initially, we have a setting, where target and nontarget firms expose to an exogenous shock, i.e., crisis, and we address the fundamental question whether target companies perform better than matching peers during the crisis period. Instead of evaluating firm's characteristics (the proxy for firm performance) before and after the activism, we evaluate the change in characteristics before and after the activism in pre- and post-crisis period. To simplify our analysis, we relax the assumption of targets being selected on observables.<sup>34</sup>

<sup>33</sup>The change in firm's characteristic is computed for both target and nontarget, before and after the crisis period. To simplify it by an example, we assume the change in market capitalization, i.e., MV:

$$\Delta Characteristic = MV_{2007-13}^t - MV_{2000-06}^t - MV_{2007-13}^m - MV_{2000-06}^m \quad (8)$$

Where  $MV_{2007-13}^t$  is the average market value of target firms sample during 2007 to 2013,  $MV_{2000-06}^t$  is the average market value of target firms sample during 2000 to 2006,  $MV_{2007-13}^m$  is the average market value of matching firms sample during 2007 to 2013,  $MV_{2000-06}^m$  is the average market value of matching firms during 2000 to 2006.

<sup>34</sup>A similar question has been partly discussed in [Bebchuk et al. \(2014\)](#) work. They use pre-crisis data to examine the impact of crisis on target's profit margin and valuation measures, however, in their setting — the sample selection is considered randomly.

Our difference-in-difference setting initially parameterizes the crisis effect in a simple regression model as:

$$\Delta Characteristic_{it} = \alpha_i + \beta_i Presence + \gamma_i Dummy_i + \theta_i Control_i + \varepsilon_i \quad (9)$$

Where  $\Delta Characteristic$  is the change in a specific characteristic before and after the crisis period in excess of matching sample firm. The explanatory variable *Dummy* takes a value of 1, if a firm is targeted during that year (during the period when we analyze the change in characteristic) by any other activist. *Presence* is a dummy variable which is equal to 1, if the activist fund still has controlling rights in the firm in the year after the crisis. The variable *Control* is the vector of specifications which control for size, indebtedness, age, year and industry fixed effects.

Following [Bebchuk et al. \(2014\)](#), we measure the change in firm characteristics for a subsample of firms targeted in 2006 and 2007 before and after the crisis. Activists generally do not stay in target for longer period and reduce their ownership on average after two years. To account for activist presence in target, we have incorporated dummy namely *Presence*. We examine change in performance on both dimensions; time variate (across the years) and as well as cross-sectional (difference with matching firm). However, there is possibility that the coefficient  $\beta$  on dummy variable can be biased, particularly when firm characteristic is likely correlated with dummy. To simplify it with an example, we assume that a firm is targeted whose debt is lower than the matching firm in 2007 and we are interested in to examine the target’s leverage position in one year post-activism. Now suppose that in year 2008, another activist hedge fund acquires a meaningful stake ( $\geq 5\%$ ) and suggests some measures which may lead the target’s leverage either to increase or decrease, thus this may cause the coefficient  $\beta$  to produce some spurious effect – especially, it may tend to overvalued the performance of *Dummy* variable in increasing or decreasing the leverage during the crisis – thus without taking these considerations into account, we may report biased estimates.

Table 25 presents the estimates on different dummies when change in firm characteristic (after minus before) is regressed. For each regression, we control for firm size, age, year and industry fixed effects. As we have relaxed the assumption of biased sample selection, we compare the target firms with a matching sample firms using a benchmark of size/book-to-market value and 2-digit *SIC* industry codes. By matching targets on

well-defined benchmark reduce our sample drastically. In addition, we are evaluating firms targeted during 2006 and 2007, therefore, lower number of observations (11%) is inevitable.

In comparison with [Bebchuk et al. \(2014\)](#) findings, the coefficient on "Fund Presence" is negative in the first year, which implies that firm value has reduced significantly in the first year of activism during the crisis period. In the second year of fund activism, however, it becomes insignificantly positive. Following the first year of activism, targets improved in profitability and profit margin (at 5% and 10% respectively) and investment (indicated by research and development), which is positively significant at 10%. These results, however, become significantly negative in second year of activism during the crisis period. We do not find any evidence that presence of another activist fund (outside sample) affects firm's performance. These results partly provide evidence that target firms enhanced their earnings and investment even during the crisis period.

In table 25, we regress the change in firm characteristic (after minus before) in excess of matching firms against a vector of dummies, and control variables.<sup>35</sup> The results obtained in cross-sectional analysis, interestingly do not deviate much from those in table 24. The estimated coefficients on change in profitability and investment are positively marginally significant. Thus, we may conclude that during crisis firms targeted by activists performed relatively well in comparison with their industry peers and we do not find evidence that targets became more fragile and vulnerable to economic shocks compared to nontargets during crisis period.

## 7 Robustness check

To examine whether our results for crisis effect and types of activism hold for different model settings, we consider several robustness checks. First, we investigate whether the size of the firm is an underlying source of surviving from getting delisted after activism.

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<sup>35</sup>The change in firm characteristics is computed for both target and nontarget before and after the crisis period in following simplistic setting:

$$\Delta Characteristic = MV_{2008-09}^t - MV_{2006-07}^t - MV_{2008-09}^m - MV_{2006-07}^m \quad (10)$$

Where  $MV_{2008-09}^t$  is the average market value for target firms sample during 2008 to 2009,  $MV_{2006-07}^t$  is the average market value for target firms sample during 2006 and 2007,  $MV_{2008-09}^m$  is the average market value for matching firms sample during 2008 and 2009,  $MV_{2006-07}^m$  is the average market value for matching firms during 2006 and 2007.

To explain further, a big portion of the targets got delisted following the activism in this study. Those firms either fully acquired or went private from public, and as a result did not report annual accounting and stock price data to Datastream. We check whether firm size plays any role during the crisis. Second, we consider the liquidity of target to assess whether it explains cross-sectional returns to the firm capital structure. Third, given that the 13G and 13D Filings are drawn from similar funds, we expect the market to react differently (high or low) to those 13D announcements, which were acquired previously with 13G.

## 7.1 Size explains the cross-sectional distribution of abnormal returns

Table 26 presents cross-section of CARs for multiple event-windows by introducing Schedule 13F and six-months pre-activism daily returns to basic model.<sup>36</sup> In our sample, a large number of activist funds hold concentrated ownership in target firms and have filed Schedule 13F along with 13D. Given that, we are interested in to analyze the impact of such significant stakeholding on market perception and the subsequent impact on initial stock price.

An overview of the estimates reveals that the coefficients on types of activism change across multiple event-windows. In the longest event-window of 26 days, the estimates on *General Undervaluation*, *Capital Structure*, and *Business Strategy* are positively significant at 10% and 5% respectively. In comparison with results presented in table 14, the magnitude of coefficients reduces, however, remain statistically significant.<sup>37</sup>

## 7.2 Impact of firm size and liquidity on *CARs* during crisis period

Table 27 presents results regressing *CARs* obtained from various event-windows against types of activism and crisis-interaction terms. We examine the market responses to the activist certain stated objective given the firm size and liquidity during the crisis period. By introducing firm size and liquidity interactive-terms into our settings, we attempt to decompose *CARs* and measure the differential effect in types of activism perceived by the market. To do so, we construct size (firm) interactive terms with all types of activism

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<sup>36</sup>Institutional investment manager is required to report Schedule 13F to the SEC within 45 days of a calendar year after having an aggregate market capitalization of at least \$100 million.

<sup>37</sup>In an auxiliary regression, we substitute firm size, market capitalization, with net sales and total assets to check whether different measures explain the cross-section of abnormal returns.

during crisis period. In constructing leverage-interaction terms, we argue that activists suggesting changes to target's capital structure may involve restructuring of the debts, in particular, during the crisis period, thus, market perceives such changes positively. To the funds getting involved with firms being financially depressed also primarily requires to restructure the debts.

In table 27, using full model specifications and a vector of control variables, we find that the estimates with interaction terms involving leverage are positively significant across various event-windows. These findings support the view that market positively responded to the activist fund's involvement in a firm capital structure during the crisis period.

## 8 Concluding summary

This study examines hedge fund activism impact on target firms' performance with a largely hand-collected unique dataset, which consists of 112 activist funds targeting 551 firms over the period of January 2000 to December 2013. An activist hedge fund accumulates 5% or more ownership stake in a firm with an intent to influence firm's internal governance by filing a Schedule 13D Form to the U.S. Securities and Exchange Commission.

The study investigates the fundamental question whether the recent financial crisis has affected the hedge fund activism. Since the crisis, critics have been questioning the effectiveness of hedge fund monitoring in target firms. Thus, we seek to examine whether crisis might have changed the traditional approach to activism and introduced new paradigm shifts, making it interesting to investigate whether and how activists have shaped the targeting patterns of impacting the firms.

The study thoroughly examines the funds' objectives, targeting tactics, firms' responses, and the evolving outcomes. In comparison with previous studies, it investigates the emerging trends in strategic ways of impacting firms before and after the crisis. The study identifies pre-crisis period starting from January 2000 to June 2007 and post-crisis from July 2007 to December 2013.

The targeted firms in our analysis share features which are partly in line with pre-



vously documented studies. These sample firms are small and medium-sized with an undervalued stock, and operationally profitable compared to the matching companies in the year before activism. A target being a small-cap allows activist hedge funds to acquire a meaningful stake, suggest measures, assert pressure, and implement their proposed agenda. To pursue their stated objectives, activists tactically interact with firm's management. In some cases, the interaction occurs in a friendly way, and on various occasions, it materializes in hostile manner.

The findings of this study are partly consistent with the prior documented literature on fund activism. In short-run, the market reacts positively to the hedge fund activism around the announcement of 13D filings. The longest  $(-20, +5)$  event-window generates a mean *CARs* about 5.34%, which is in line with reported studies. A large part of the variation in cross-sectional *CARs* accrues to the activists targeting firms with an objective of restructuring the debts followed by business-related activism. Since the crisis, funds targeting firms to change the business-strategy earn more than 15% returns which are followed by funds targeting financially depressed firms.

We also test the competitive hypothesis whether abnormal short-run returns are extracted at the cost of long-term value destruction. The long-term accounting performance of the targets, after one year of activism, suggests mixed results. Target firms substantially find an increase in profitability, investment, and improvement in value.

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**Table 1: Variable definitions**

<b>Variable</b>	<b>Description</b>
Market value	Total number of outstanding shares times price per share.
Net sales	Firm's annual sales in dollars.
Tobin's Q	Aggregate of long-term debt and the market value of equity divided by aggregate of long-term debt and the book value of equity.
Book-to-market ratio	Firm book value of equity/market value of equity.
Growth in sales	Annual percentage growth in sales.
Cash flows	Cash as a percentage of total assets.
Book leverage	Total debt divided by the aggregate of total debt plus the book value of total equity.
Market leverage	Total debt divided by the aggregate of total debt and market value of equity.
Cash	Aggregate of cash and cash equivalents divided by total assets.
New equity	Amount of new equity issued during the year divided by the lagged assets.
Dividend yield	Aggregate of common dividend and preferred dividend divided by the aggregate of the market value of common stock and market value of preferred stock.
Payout	Total dividend divided by the net income before extraordinary items.
Capital expenses	Capital expenses as percentage of total assets.
Research and development	Research and development as a percentage of total assets.
Return on equity	Net income divided by total equity.

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	<b>Variable</b>	<b>Description</b>
Profitability		Earnings before interest and taxes divided by net sales.
Liquidity		Cash and short-term assets divided by current liabilities.
Growth ratio		Retention rate, which is equal to 1 minus dividend declared divided by the net income
Return on equity		Net income divided by the total equity.
WACC		Weighted average cost of capital, computed as: $\frac{E}{V}R_e + \frac{D}{V}R_d(1 - T_c)$ $R_e$ Cost of equity $R_d$ Cost of debt $E$ Total common shareholders equity $D$ Total debt $V$ Total value is an aggregate of total equity and total debt.
Cost of equity		Dividend per share divided by the current market value of stock multiplied by the growth rate of dividends.
Cost of debt		Annual interest payment of total debt divided by market value.
Industry		2-digit SIC industry codes of each firm

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*Data*

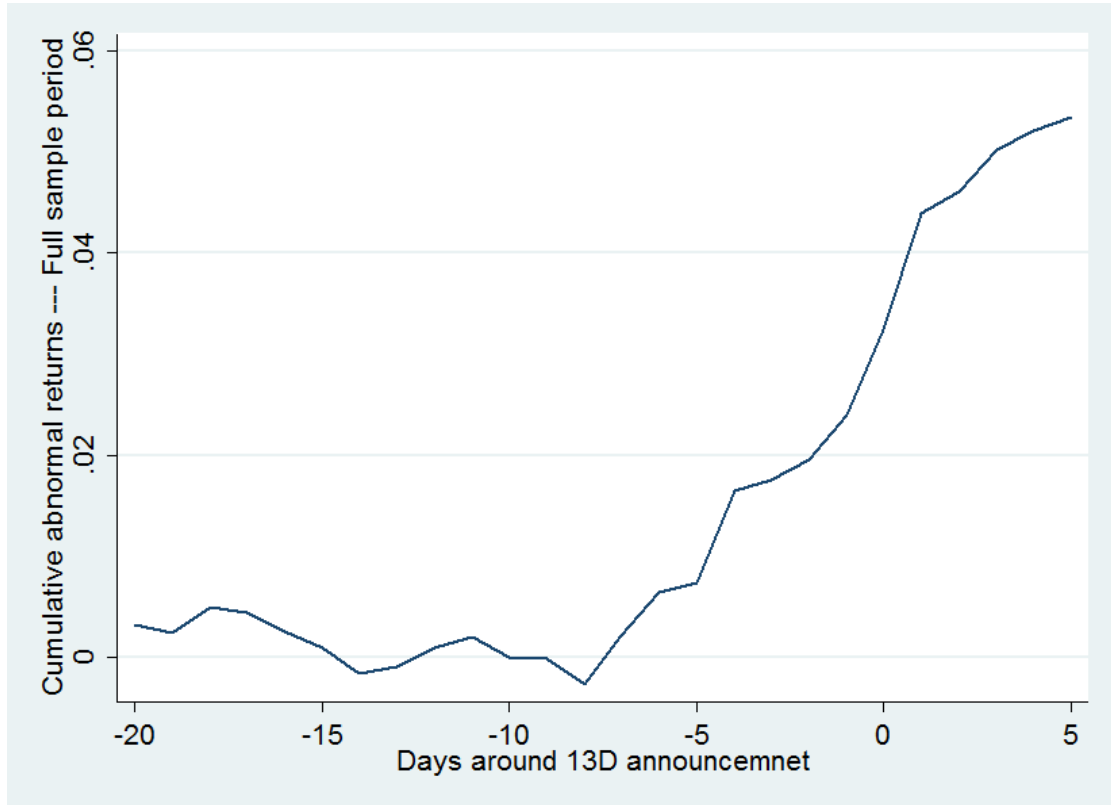
*sources:*

All accounting and financial figures are extracted from the annual reports of target firms using Datatream.



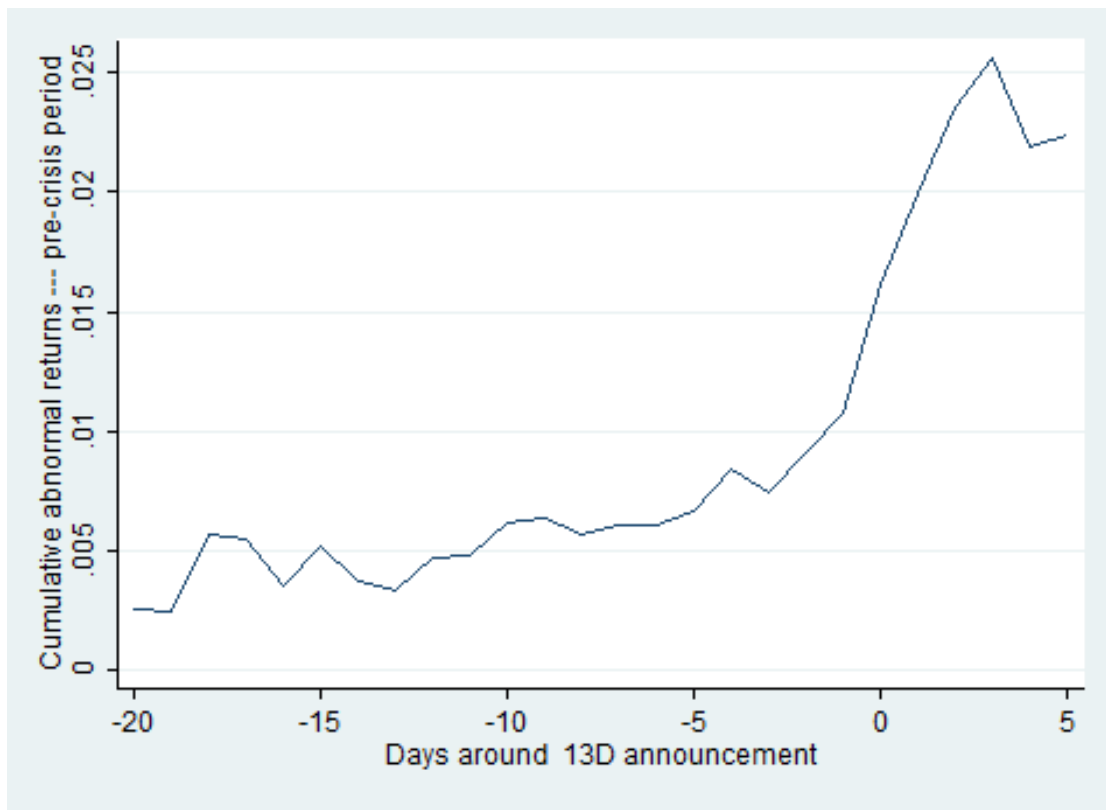
**Figure 1: CARs (-20, +5)**

Cumulative abnormal returns are plotted over the longest event window of (-20, +5) 26 days for a sample of 551 firms targeted by 112 hedge funds over the period of January 2000 to December 2013. To compute *CARs* for each target, we use [Fama and French \(1993\)](#) well-constructed six value-weighted portfolios formed on size, and book-to-market value. 0 indicates the announcement date when the activist formally reports a 13D Schedule to the Securities and Exchange Commission of the US within ten days of acquiring ownership in the firm. We consider 20 days prior to the event date and extend to 5 days after the announcement date.



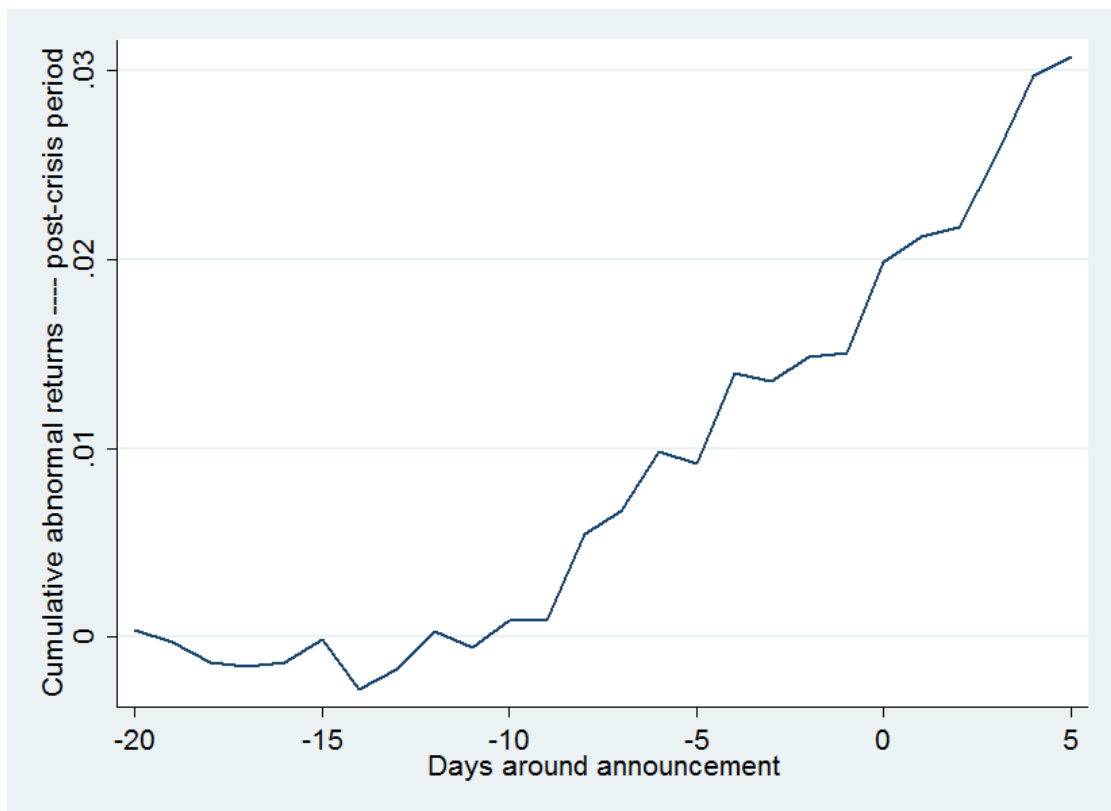
**Figure 2: Pre-crisis CARs (-20, +5)**

We decompose the sample into two subgroups: pre- and post-crisis period. In our study, we define pre-crisis period employing a dummy which takes the value one if a firm is targeted in the period from January 2000 to June 2007. Figure 2 plots CARs for the pre-crisis period. Out of total 551 firms, 334 firms or 60% of the sample falls in the pre-crisis period. To compute *CARs* for each target, we use [Fama and French \(1993\)](#) well-constructed six value-weighted portfolios formed on size, and book-to-market value.



**Figure 3: Post-crisis CARs (-20, +5)**

Figure 3 exhibits the CARs performance in the post-crisis period. In the sample, we define post-crisis period from July 2007 to December 2013. 40% of the sample, which constitutes around 220 firms fall into post-crisis period. To compute *CARs* for each target, we use [Fama and French \(1993\)](#) well-constructed six value-weighted portfolios formed on size, and book-to-market value.



**Table 2: Variable definitions**

<b>Variable</b>	<b>Description</b>
Market value	Total number of outstanding shares times price per share.
Net sales	Firm's annual sales in dollars.
Tobin's Q	Aggregate of long-term debt and the market value of equity divided by aggregate of long-term debt and the book value of equity.
Book-to-market ratio	Firm book value of equity/market value of equity.
Growth in sales	Annual percentage growth in sales.
Cash flows	Cash as a percentage of total assets.
Book leverage	Total debt divided by the aggregate of total debt plus the book value of total equity.
Market leverage	Total debt divided by the aggregate of total debt and market value of equity.
Cash	Aggregate of cash and cash equivalents divided by total assets.
New equity	Amount of new equity issued during the year divided by the lagged assets.
Dividend yield	Aggregate of common dividend and preferred dividend divided by the aggregate of the market value of common stock and market value of preferred stock.
Payout	Total dividend divided by the net income before extraordinary items.
Capital expenses	Capital expenses as percentage of total assets.
Research and development	Research and development as a percentage of total assets.
Return on equity	Net income divided by total equity.

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Variable	Description
Profitability	Earnings before interest and taxes divided by net sales.
Liquidity	Cash and short-term assets divided by current liabilities.
Growth ratio	Retention rate, which is equal to 1 minus dividend declared divided by the net income
Return on equity	Net income divided by the total equity.
WACC	Weighted average cost of capital, computed as: $\frac{E}{V}R_e + \frac{D}{V}R_d(1 - T_c)$ $R_e$ Cost of equity $R_d$ Cost of debt $E$ Total common shareholders equity $D$ Total debt $V$ Total value is an aggregate of total equity and total debt.
Cost of equity	Dividend per share divided by the current market value of stock multiplied by the growth rate of dividends.
Cost of debt	Annual interest payment of total debt divided by market value.
Industry	2-digit SIC industry codes of each firm

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*Data sources:* All accounting and financial figures are extracted from the annual reports of target firms using Datastream.

**Table 3: Number of hedge funds and their target firms**

This table summarizes in detail the total events, and number of firms targeted by activist hedge funds over the period of 2000 to 2013.

Fund / Firm pair	Number
Total fund/firm pairs	760
Individual fund/target firm pair	760
Number of individual targets	688
Number of individual funds	112
Number of hedge fund management companies	86
Number of firms targeted once	398
Number of firms targeted twice	114
Number of firms targeted thrice	27
Number of firms targeted four times	12
Number of activist hedge funds with 1 target	18
Number of activist hedge funds with 2 targets	13
Number of activist hedge funds with 3 targets	11
Number of activist hedge funds with 4 targets	15
Number of activist hedge funds with 5 targets	11
Number of activist hedge funds with 6 targets	13
Number of activist hedge funds with 7 targets	15
Number of activist hedge funds with more than 8 targets	16

**Table 4: Chronological distribution of funds**

The table represents the chronological distribution of the activist hedge funds over the period of January 2000 to December 2013.

Years	Number of Funds	Percentage of sample
2000	10	8.93%
2001	4	3.57%
2002	7	6.25%
2003	6	5.36%
2004	7	6.25%
2005	7	6.25%
2006	13	11.61%
2007	10	8.93%
2008	9	8.04%
2009	9	8.04%
2010	17	15.18%
2011	6	5.36%
2012	2	1.79%
2013	5	4.46%
<b>Total</b>	<b>112</b>	<b>100.00%</b>

**Table 5: Chronological distribution of target and matching firms**

The following table represents the chronological distribution of firms drawn from Schedule 13D Files, and Schedule 13G Files from EDGAR search system in Securities and Exchange Commission of the US. These files are reported by a similar set of activist US hedge funds over the period of January 2000 to December 2013. A 13D Disclosure indicates the intent of an activist to influence the internal governance of target firm whereas a 13G Disclosure shows a fund has no intention to play an active role. All firms are publicly traded at *NYSE/AMEX/NASDAQ* exchanges.

Year	No. of targets	% of sample	No. of matching	% of sample
2000	23	4.24%	12	1.34%
2001	30	5.52%	28	3.12%
2002	33	6.08%	35	3.90%
2003	28	5.16%	78	8.69%
2004	38	7.00%	106	11.80%
2005	68	12.52%	76	8.46%
2006	67	12.34%	148	16.48%
2007	77	14.18%	122	13.59%
2008	55	10.13%	83	9.24%
2009	23	4.24%	55	6.12%
2010	48	8.84%	87	9.69%
2011	32	5.89%	42	4.68%
2012	10	1.84%	9	1.00%
2013	11	2.03%	17	1.89%
<b>Total</b>	<b>543</b>	<b>100%</b>	<b>898</b>	<b>100%</b>



**Table 6: Percentage of ownership held by fund and firm**

The table represents the summary statistics of the information gathered from Schedule 13D Filing using several items, in particular, Item 5 known as "Interest in the Securities of the Issuer." This statistics provides averages about 760 events filed by 112 activist hedge funds over the period of January 2000 to December 2013.

Initial Filing	Mean	Median	Sd.	Min	Max	Obs.
Shares held by hedge fund (\$mil.)	46.1	2,600,329	626	147	12200	733
Total outstanding shares by the target	410	28	7930	363	210000	717
Percentage of ownership held by fund	13.13%	7.75%	15.87%	5.71%	100.00%	717
Cost(incl./excl.commission)(\$mil.)	77.7	16.1	222	7794.2	2310	433

**Table 7: Categories of activism**

This table summarizes the stated objectives and categorizes them into well-defined types of activism for the 760 events reported over the period of January 2000 to December 2013. The types of activism are classified partly following the specifications of Brav et al. (2008). Each type of activism is a dummy which takes value 1 if a specific objective falls in a particular category. The categories are non-mutually exclusive. Panel A summarizes types for the entire set of events. Panel B presents the summary of activism types for the pre-crisis period which begins from January 2000 to until June 2007. For one-third observations which fall in the post-crisis period between July 2007 to December 2013, panel C illustrates the information on types of activism.

*Panel A: Types of activism for entire sample period*

No.	Category	Stated Objective	Number of Events	% of Total
1	CAT1	General Undervaluation	601	79.3%
2	CAT2	Capital Structure	51	6.7%
3	CAT3	Business Strategy	119	15.7%
4	CAT4	Sale of Target Firm	41	5.4%
5	CAT5	Governance	85	11.2%
6	CAT6	Bankruptcy/ Chapter 11	10	1.3%
7	CAT7	Arbitrage	2	0.3%

*Panel B: Types of activism before crisis Jan 2000 - June 2007*

No.	Category	Stated Objective	Number of Events	% of Total
1	CAT1	General Undervaluation	381	68.16%
2	CAT2	Capital Structure	32	5.72%
3	CAT3	Business Strategy	68	12.16%
4	CAT4	Sale of Target Firm	23	4.11%
5	CAT5	Governance	52	9.30%
6	CAT6	Bankruptcy/ Chapter 11	3	0.54%
7	CAT67	Arbitrage	2	0.3%

*Panel C: Types of activism during and after crisis July 2007 - December 2013*

No.	Category	Stated Objective	Number of Events	% of Total
1	CAT1	General undervaluation	221	63.14%
2	CAT2	Capital Structure	20	5.71%
3	CAT3	Business Strategy	51	14.57%
4	CAT4	Sale of Target Company	18	5.14%
5	CAT5	Governance	33	9.43%
6	CAT6	Bankruptcy/ Chapter 11	7	2.00%

**Table 8: Fund techniques to influence the target**

The following table summarizes the qualitative information about an activist fund on how it plans to carry out agenda of influencing the target firm. Activist describes its reason of targeting firm in Item 4 known as "Purpose of Transaction," along with precise plan of action to implement the course of agenda in target firm. These suggested measures could be of multiple-tasking in nature simultaneously. We collect this information from 760 Schedule 13D reported to SEC and filed by 112 activist hedge funds over the period of January 2000 to December 2013.

<b>No</b>	<b>Tactics</b>	<b>Number of Events</b>	<b>Percentage of Events</b>
1	Meeting with the management on preliminary basis in order to get involve with business activities / negotiation	408	53.62%
2	Seeking board seat for better representation of shareholders interest and to maximize the value through large stake	93	12.25%
3	No more board representation / withdrawal of board seat	17	2.24%
4	Negotiation over limiting poison pills	7	0.92%
5	Shareholder proposal for business structure changes	65	8.56%
6	Negotiation with the larger shareholders in order to change managerial or corporate policy changes	41	5.40%
7	compel to restructure/working with other shareholders	69	9.09%
8	Solicitation/ proxy contest for board replacement or other managerial changes / preventing from acquiring or merging	31	4.08%
9	Legal Suing /sues in the bankruptcy court to fulfill the legal requirements	17	2.24%
10	Acquiring of the total firm/ complete buyout / merging with other firm	12	1.58%
<b>Total</b>		<b>760</b>	<b>100%</b>

**Table 9: Target characteristics in year before activism**

This table reports the characteristics of target firms for the year before activism and compares it with a matching sample based on size/book-to-market/2-digit SIC industry. The sample consists of 551 firms targeted by 112 hedge funds over the period of 2000 to 2013. Market Value is firm stock price times number of shares outstanding and measured in dollars. Sales represent firm annual sales in dollars. Tobin's  $Q$  is defined as (long-term debt + the market value of equity / long term debt + the book value of equity). The book-to-market ratio is expressed as the book value of equity / market value of equity. Sales Growth is annual percentage growth in sales. Book Leverage is defined as debt / (debt + book value of equity), Leverage is measured as total debts / total equity, Market Leverage is defined as debt / (debt + market value of equity). Cash as a percentage of assets is defined (cash + cash equivalents) / assets. Dividend Yield is defined as (common dividend + preferred dividend) / (market value of common stock + market value of preferred stock). The payout is defined as total dividend / net income before extraordinary items. Capital Expenses and Research and Development are measured as a percentage of assets. Profitability is operating profit margin and measured as EBIT / Net sales. The entire set of data is extracted from Thomson Reuters DataStream. We report the mean, median, and standard deviation for both target and nontarget samples. Column VII exhibits the difference in medians between the target and matching firm, and column VIII reports the p-value to demonstrate the level of significance in medians. All variables are winsorized at 1%.

Characteristics	Target firms			Matching firms			Median comparison <sup>1</sup>	
	Mean	Median	Sd.	Mean	Median	Sd.	Difference	p-val
Market Value (\$mil.)	987.86	257.78	2,257.88	936.22	270.33	2,066.06	-12.55	0.2003
Sales (\$mil.)	869.22	279.20	1,568.37	613.68	92.36	1,268.47	186.84	0.0001
Tobin's Q	2.56	1.55	4.01	2.13	0.77	5.62	0.78	0.0000
Book-to-market	-1.10	0.45	21.67	-1.37	0.43	25.85	0.02	0.0385
Growth	1.11	1.04	0.67	1.10	1.02	1.24	0.02	0.0454
ROA	-0.04	0.03	0.43	-0.18	-0.01	0.50	0.04	0.0000
Book Leverage	0.46	0.29	1.03	2.13	0.77	5.62	-0.48	0.0000
Leverage	0.83	0.27	4.86	0.41	0.16	2.52	0.11	0.0942
Market Leverage	0.26	0.19	0.27	0.18	0.06	0.24	0.13	0.0022
Cash	0.15	0.08	0.19	0.30	0.21	0.29	-0.13	0.0000
Dividend Yield	0.45	0.00	1.35	0.02	0.00	0.08	0.00	0.0041
Payout	0.00	0.00	0.59	0.17	0.00	2.01	0.00	0.4575
Capital Exp.	0.13	0.01	0.23	0.12	0.01	0.25	0.00	0.6390
R& D	0.10	0.02	0.23	0.12	0.01	0.25	0.01	0.0403
Profit	-2.62	0.04	17.04	-6.32	0.01	32.17	0.03	0.0792
Assets (\$mil.)	1,426.21	356.61	4,021.32	919.04	120.43	2,670.10	236.18	0.0000

<sup>1</sup> Wilcoxon signed rank test for differences in medians between the target and the matched firms.

**Table 10: Logit regression – Likelihood of fund activism**

The table reports the effects of covariates on the probability of being targeted by a hedge fund in the year before activism. The dependent variable is a dummy which takes a value 1 if a firm had been a target in the previous year. All independent variables are lagged by one year. Column I reports the coefficients and column II reports marginal probabilities. All data is extracted from Datastream. We winsorize all variables at 1%. \*, \*\*, \*\*\* Indicate the level of significance at 10%, 5%, and 1%.

Characterisitcs	Coefficients	Marginal Probabilities
Market Capitalization	-2.962** -1.439	-0.414* 0.232
Total Sales	-0.109 (0.151)	-0.015 0.0206
Growth	-0.325 (0.199)	-0.045* 0.027
Return on Assets	-0.679* (0.397)	-0.095* 0.057
Tobins Q	-0.540** (0.217)	-0.075*** 0.023
Book to Market value	0.169 (0.108)	0.024 0.016
Book Leverage	0.575*** (0.221)	0.080*** 0.024
Cash	1.769* -1,064	0.247 0.154
Dividend Yield	-0.795 (0.727)	-0.111 0.089
Research Development	-0.000 (0.000)	-1.51e-07 0.000
Capital Expenditures	-6.026* -3,157	-0.842 0.531
Constant	1.182** (0.572)	- -
Observations	88	
Pseudo R-squared	0.211	

**Table 11: Target characteristics in the year before activism - Crisis period 2007 -2013**

This table presents the characteristics of firms targeted during 2007 to 2013 in the year prior to activism. We decompose our full sample (2000–2013) into two parts; before and after the crisis period. For crisis period, we include the years from 2007 to 2013. Target firms’ characteristics are compared with a matching sample using a benchmark of size, book-to-market value, and 2–digit SIC codes. Table 2 in Appendix provides detailed definition about the variables. The data on accounting measures is extracted from using Thomson Reuters DataStream. We report summary statistics including mean, median, and standard deviation for both target and nontarget samples. Column VII exhibits the difference in medians between the target and matching firm, and column VIII reports the Wilcoxon signed-rank test p-value to demonstrate the level of statistical significance in medians. All variables are winsorized at 1%.

Characteristics	Target firms			Matching firms			Median comparison <sup>1</sup>	
	Mean	Median	Sd	Mean	Median	Sd	Difference	p-val
Market Value (\$mil.)	961.75	257.78	2527.90	1068.63	261.49	2420.86	-3.71	0.0237
Sales (\$mil.)	862.22	260.02	1694.81	830.87	97.13	1607.09	162.89	0.0210
Tobin’s Q	2.15	1.48	2.00	1.78	0.63	4.23	0.85	0.0046
Book-to-market	0.69	0.54	0.79	0.57	0.59	1.54	-0.05	0.3878
Growth	1.17	1.05	0.89	1.17	1.01	1.42	0.04	0.1578
ROA	-0.003	0.03	0.19	-0.15	-0.00	0.62	0.03	0.0034
Book Leverage	0.54	0.39	0.69	1.78	0.63	4.23	-0.24	0.3709
Leverage	1.37	0.52	7.76	0.22	0.16	1.91	0.36	0.2364
Market Leverage	0.31	0.26	0.23	0.22	0.07	0.26	0.19	0.0635
Cash (% Assets)	0.14	0.09	0.14	0.29	0.16	0.29	-0.07	0.0157
Dividend Yield	2.33	1.73	1.98	0.02	0.00	0.12	1.73	0.0077
Payout	0.05	0.06	0.69	-0.01	0.00	0.47	0.06	0.6245
R&D	0.11	0.08	0.12	0.12	0.00	0.30	0.08	0.9443
Profit	-0.69	0.03	2.71	-0.07	0.03	0.37	0.00	0.2636
Assets (\$mil.)	1670.56	380.50	5242.40	1364.16	162.03	3203.39	218.47	0.0108

<sup>1</sup> Wilcoxon signed rank test for differences in medians between the target and the matched firms.

**Table 12: Firm characteristics during crisis period 2007 - 2013 using propensity score matching**

This table reports the results gained using propensity score matching approach. For a set of 263 target firms, we match them with 545 nontarget firms using propensity score during 2007 to 2013. In the model, we include firm characteristics, industry, and year. All variables are well-defined in Appendix table ???. \*\*\*, \*\*, \* indicate 1%, 5%, and 10% level of statistical significance.

Variables	Sample	Treated	Control	Difference	S.E.	T-test
<i>LMV</i>	Unmatched	4.898	6.588	-1.689	0.304	-5.54
	<i>ATT</i>	5.283	5.62	-0.342	0.476	-0.72
<i>LSales</i>	Unmatched	18.63	20.232	-1.599	0.347	-4.60
	<i>ATT</i>	18.811	19.57	-0.762	0.556	-1.37
Growth	Unmatched	2.123	1.275	0.848	0.433	1.96
	<i>ATT</i>	1.145	1.421	-0.275	0.231	-1.19
Profit	Unmatched	-0.964	-0.159	-.804	0.288	-2.79
	<i>ATT</i>	-0.052	-0.633	0.580	0.414	1.40
ROA	Unmatched	-0.228	0.0155	-0.244	0.074	-3.26
	<i>ATT</i>	0.008	-0.106	0.114	0.087	1.32
Tobin's Q	Unmatched	2.22	2.811	-.587	0.426	-1.38
	<i>ATT</i>	2.476	2.302	.173	0.891	0.19
Book/Market	Unmatched	0.342	0.576	-0.233	0.189	-1.23
	<i>ATT</i>	0.530	0.693	-0.163	0.164	-0.99
Book Leverage	Unmatched	0.503	0.328	0.175	0.085	2.13
	<i>ATT</i>	0.274	0.390	-0.116	0.113	-1.03
Market Leverage	Unmatched	0.268	0.193	0.074	0.045	1.63
	<i>ATT</i>	0.148	0.218	-0.070	0.068	-1.02
Leverage	Unmatched	2.700	2.509	0.191	0.347	0.55
	<i>ATT</i>	3.252	3.330	-0.078	0.800	-0.10
Dividend Yield	Unmatched	0.282	0.260	0.022	0.149	0.15
	<i>ATT</i>	0.201	0.00	0.201	0.121	1.65
R&D	Unmatched	0.194	0.072	0.122	0.048	2.53
	<i>ATT</i>	0.103	0.116	-0.0131	0.051	-0.26
CapEx	Unmatched	4.938	5.692	-0.754	1.406	-0.54
	<i>ATT</i>	5.371	5.36	0.0111	2.828	0.00
<i>LAssets</i>	Unmatched	19.037	20.387	-1.350	0.3134	-4.31
	<i>ATT</i>	19.046	19.749	-0.702	0.487	-1.44

**Table 13: CARs for multiple event windows and statistical significance**

The table reports cumulative abnormal returns for multiple event-windows and their statistical significance for a sample of 551 firms targeted over the period of January 2000 to December 2013. The longest event window spans over  $(-20, +5)$  or 26 days. The event date is the day, when an activist officially announces its holding in target firm upon crossing 5% or more ownership stake. The price data to compute daily returns is extracted by using Thomson Reuters Datastream. \*\*\*, \*\*, \* Indicates 1%, 5%, and 10% level of significance.

Event Window	CARs
$(-20, +5)$	5.34% ***
$(-10, +5)$	5.14%***
$(-10, +10)$	5.43%***
$(0, +15)$	2.80%***



**Table 14: Cross-section of *CARs* and types of activism**

The following table reports the OLS regression results. The dependent variable is cumulative abnormal returns computed at multiple event-windows around the announcement dates in the short-run. We regress *CARs* obtained from various event-windows against well- defined types of activism and estimates are illustrated in four models. All regression control for the size of firm, industry and year fixed effects. Firm size (logarithm of market capitalization), and long-term debt (ratio of the natural logarithm of long-term debt to the sum of the natural logarithm of total debt and market value of equity) are deviated from median value. The activism categories are general undervaluation, capital structure, business strategy, the sale of the target firm, and corporate governance. All categories are non-mutually exclusive. The types of activism are dummies; General Undervaluation is set to 1 if fund simply states its objective in its transaction purpose to value maximize without any confrontation or future strategic plan, 0 otherwise; Capital Structure is equal to 1, if fund targets the company with clear stated goal of changing in capital structure in its purpose of transaction, 0 otherwise; Business Strategy is set to 1, if fund explicitly describes it objective as to make changes in targets business direction, 0 otherwise; Sale of Target is set to 1, if fund mentions its goal to sell partially or fully its target, 0 otherwise; Corporate Governance is equal to 1, if fund describes its objective to involve in its target governance matters, 0 otherwise. The cumulative abnormal returns are regressed into four separate models with multiple event windows of (-20,+5), (-10,+10), (-10,+5), and (0, +15). The standard errors are adjusted for heteroskedasticity. \*, \*\*, and \*\*\* indicate 10%, 5%, and 1% level of statistical significance.

<i>Independent Variables</i>	<i>Dependent Variable</i>							
	<i>Cumulative Abnormal Returns on Different Event-Windows</i>							
	CAR(-20,+5)		CAR(-10,+5)		CAR(-10,+10)		CAR(0,+15)	
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
<i>LMV</i>	-0.026***	0.008	-0.017***	0.006	-0.017**	0.007	-0.010*	0.005
<i>LTD</i>	0.004	0.003	0.003	0.002	0.002	0.002	-0.002	0.002
General Undervaluation	0.028*	0.015	0.039***	0.011	0.042***	0.012	0.019*	0.010
Capital Structure	0.122**	0.050	0.095**	0.047	0.077	0.050	-0.028	0.065
Business Strategy	0.092**	0.038	0.075**	0.034	0.079**	0.039	0.033	0.028
Sale of target	0.044	0.035	0.015	0.025	0.031	0.027	0.046**	0.019
Governance	0.019	0.048	0.011	0.028	0.008	0.041	0.004	0.049
Year		Y		Y		Y		Y
Industry		Y		Y		Y		Y
Observations		355		355		355		355
R2		0.090		0.108		0.082		0.027
Adjusted R2		0.076		0.094		0.068		0.013

**Table 15: Cross-section of CARs and types of activism – crisis effect**

This table reports the OLS regression results for the cross-section of *CARs* as dependent variable against the well-defined categories of activism for various event windows. Following the specification of [Maier et al. \(2011\)](#), the crisis dummy is set to 1 if the observation falls in the period from July 2007 to December 2013. We incorporate crisis dummy. All regression control for the size of firm, industry and year fixed effects. Firm size (logarithm of market capitalization), and long-term debt (ratio of the natural logarithm of long-term debt to the sum of natural logarithm of total debt and market value of equity) deviate from the median value. The activism categories are general undervaluation, capital structure, business strategy, the sale of the target firm, corporate governance, and Chapter 11. All categories are non-mutually exclusive. The types of activism are dummies which take value 1 if an activist explicitly states its objective to intervene in a firm with pre-specified purpose. The cumulative abnormal returns are regressed into four separate models with multiple event windows of (-20,+5), (-10,+10), (-10,+5), and (0, +15). The standard errors are adjusted for heteroskedasticity and reported in parentheses for each coefficient. \*, \*\*, and \*\*\* indicate 10%, 5%, and 1% level of statistical significance.

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<i>VARIABLES</i>	<i>Dependent Variable</i>			
	<i>Cumulative Abnormal Returns on Different Event-Windows</i>			
	<i>CARs</i> (-20, +5)	<i>CARs</i> (-10, +5)	<i>CARs</i> (-10,+10)	<i>CARs</i> (0,+15)
Crisis	0.102*** (0.030)	0.119*** (0.023)	0.124*** (0.025)	0.139*** (0.029)
<i>MV</i>	-0.013** (0.006)	-0.011* (0.006)	-0.013* (0.006)	-0.015** (0.006)
<i>LEV</i>	0.141*** (0.051)	0.040 (0.040)	0.049 (0.039)	0.083 (0.051)
General Undervaluation	-0.052 (0.044)	-0.004 (0.040)	-0.043 (0.041)	-0.045 (0.045)
Capital Structure	0.023 (0.061)	-0.019 (0.061)	-0.019 (0.063)	0.004 (0.067)
Business Strategy	0.033 (0.036)	0.048 (0.034)	0.050 (0.037)	0.013 (0.039)
Target Sale	0.001 (0.065)	0.047 (0.058)	0.041 (0.053)	0.036 (0.071)
Governance	-0.037 (0.045)	-0.017 (0.042)	-0.029 (0.047)	-0.034 (0.046)
Chapter 11	-0.043 (0.075)	-0.062 (0.064)	-0.079 (0.064)	-0.150** (0.071)
Year	Y	Y	Y	Y
Industry	Y	Y	Y	Y
Observations	355	355	355	355
Adjusted R-squared	0.095	0.172	0.165	0.104

**Table 16: Cross-section of *CARs* and activism types – Crisis interactive terms**

This table reports the OLS regression results for the cross-section of *CARs* as dependent variable against the well-defined categories of activism for various event windows. Following the specification of [Maier et al. \(2011\)](#) study, the crisis dummy is set to 1 if the observation falls in the period from July 2007 to December 2013. To assess the crisis effect, we create crisis interaction dummies for each category. All regression control for the size of firm, industry and year fixed effects. MV (logarithm of market capitalization), and LEV (ratio of the natural logarithm of long-term debt to the sum of the natural logarithm of total debt and market value of equity) have deviated from mean value. The activism categories are General Undervaluation, Capital Structure, Business Strategy, Target Sale, Corporate Governance, and Chapter 11. All categories are non-mutually exclusive. The types of activism are dummies which take value 1 if an activist explicitly states its objective to intervene in a firm with pre-specified purpose. The cumulative abnormal returns are regressed into four separate models with multiple event windows of (-20,+5), (-10,+10), (-10,+5), and (0, +15). The standard errors are adjusted for heteroskedasticity and reported in parentheses for each coefficient. \*, \*\*, and \*\*\* indicate 10%, 5%, and 1% level of statistical significance.

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<i>Variables</i>	<i>Dependent Variable</i>			
	<i>Cumulative Abnormal Returns on Different Event-Windows</i>			
	<i>CARs</i> (-20, +5)	<i>CARs</i> (-10, +5)	<i>CARs</i> (-10, +10)	<i>CARs</i> (0, +15)
<i>MV</i>	-0.012* (0.006)	-0.011* (0.006)	-0.011* (0.006)	-0.014** (0.007)
<i>LEV</i>	0.131*** (0.048)	0.041 (0.039)	0.041 (0.039)	0.085 (0.051)
General Value* Crisis	0.043 (0.031)	0.081*** (0.025)	0.081*** (0.025)	0.078** (0.032)
Capital Structure* Crisis	0.122 (0.097)	0.001 (0.089)	0.001 (0.089)	0.132 (0.105)
Business Strategy* Crisis	0.134** (0.059)	0.137** (0.061)	0.137** (0.061)	0.124* (0.067)
Target Sale* Crisis	0.070 (0.066)	0.092 (0.057)	0.092 (0.057)	0.131* (0.071)
Governance* Crisis	0.025 (0.055)	0.050 (0.054)	0.050 (0.054)	0.042 (0.062)
Chapter 11* Crisis	0.097* (0.052)	0.053 (0.042)	0.053 (0.042)	0.019 (0.049)
Year	Y	Y	Y	Y
Industry	Y	Y	Y	Y
Observations	355	355	355	355
Adjusted R-squared	0.091	0.170	0.170	0.092

**Table 17: Cross-section of *CARs* and activism types with crisis interactive terms using full model specification**

We regress *CARs* obtained from multiple event-windows against types of activism with crisis interactive terms in three separate models. Following the specification of Maier et al. (2011), the crisis dummy is set to 1 if a firm is targeted during the period from July 2007 to December 2013. In the model I, column (1), we regress *CARs* for 26 days using full specifications including crisis, industry and year fixed effects. For column (2), we do not include crisis since it is highly correlated with types of activism, and year fixed effects. In column (3), we do not include crisis dummy, industry, and year fixed effects. We exercise similar model specifications for *CARs* for (-10, +5), and (-10, +10) event-windows. All regressions control for size and leverage which are not reported for the sake of space. The standard errors are adjusted for heteroskedasticity and reported in parentheses for each coefficient. \*, \*\*, and \*\*\* indicate 10%, 5%, and 1% level of statistical significance.

<i>Independent Variables</i>	<i>CARs</i> (-20, +5)			<i>CARs</i> (-10, +5)			<i>CARs</i> (-10, +10)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gen. Undervaluation	-0.032 (0.052)	-0.090** (0.045)	-0.011 (0.032)	-0.015 (0.045)	-0.062 (0.041)	0.019 (0.029)	-0.027 (0.053)	-0.107** (0.049)	-0.007 (0.035)
Capital Structure	0.044 (0.062)	0.003 (0.069)	0.030 (0.065)	0.015 (0.078)	-0.006 (0.077)	0.027 (0.074)	0.016 (0.082)	-0.034 (0.084)	0.004 (0.079)
Business Strategy	-0.013 (0.048)	-0.045 (0.044)	0.000 (0.042)	0.005 (0.037)	-0.030 (0.035)	0.016 (0.035)	-0.016 (0.049)	-0.064 (0.045)	-0.010 (0.044)
Target Sale	0.004 (0.063)	-0.024 (0.078)	0.001 (0.069)	0.037 (0.070)	0.019 (0.075)	0.036 (0.062)	0.026 (0.066)	-0.012 (0.087)	0.022 (0.074)
Governance	-0.043 (0.054)	-0.053 (0.062)	-0.010 (0.061)	-0.051 (0.046)	-0.061 (0.042)	-0.019 (0.041)	-0.042 (0.060)	-0.060 (0.066)	-0.013 (0.064)
Chapter 11	-0.027 (0.093)	0.016 (0.071)	0.013 (0.046)	-0.054 (0.091)	-0.000 (0.062)	0.032 (0.047)	-0.144 (0.096)	-0.080 (0.070)	-0.057 (0.050)
Crisis	0.114 (0.114)	- (-)	- (-)	0.020 (0.100)	- (-)	- (-)	0.145 (0.125)	- (-)	- (-)
Gen. Value* Crisis	0.035 (0.083)	0.061* (0.034)	0.061* (0.034)	0.022 (0.078)	0.092*** (0.027)	0.092*** (0.026)	0.035 (0.089)	0.097*** (0.035)	0.094*** (0.035)
Capital Structure* Crisis	0.005 (0.129)	0.070 (0.116)	0.068 (0.107)	0.068 (0.126)	0.026 (0.114)	0.037 (0.103)	0.028 (0.141)	0.107 (0.128)	0.106 (0.121)
Bus. Strategy* Crisis	0.079 (0.074)	0.155** (0.071)	0.126* (0.072)	0.090 (0.071)	0.151** (0.068)	0.123* (0.071)	0.058 (0.081)	0.159** (0.077)	0.128 (0.079)
Target Sale* Crisis	0.021 (0.111)	0.045 (0.091)	0.064 (0.090)	0.002 (0.103)	0.038 (0.084)	0.063 (0.080)	0.005 (0.122)	0.082 (0.101)	0.101 (0.095)
Governance* Crisis	0.019 (0.084)	0.038 (0.084)	0.027 (0.081)	0.069 (0.084)	0.084 (0.068)	0.073 (0.071)	0.022 (0.094)	0.054 (0.089)	0.050 (0.087)
Default* Crisis	-	-	-	-	-	-	-	-	-
Industry	Y	Y	N	Y	Y	N	Y	Y	N
Year	Y	N	N	Y	N	N	Y	N	N
Observations	355	355	355	355	355	355	355	355	355
Adjusted R-squared	0.184	0.089	0.064	0.224	0.169	0.119	0.191	0.092	0.065

**Table 18: Long-term performance in target firms – Time series analysis**

We report the results obtained from using propensity score matching approach in time-series setting. Target firms are matched with industry peers based on firm characteristics, 2-digit SIC codes in a similar year using propensity score. The dependent variable is the net difference between the firm characteristic in the year after activism minus year before activism. The independent variable is a dummy taking value 1 if a firm is targeted in the year before activism, 0 otherwise. The coefficient on *Activism Dummy* is interpreted as the average effect of activism after one year. For each regression, we use a vector of control variables including industry, and year fixed effects. Firm characteristics are well-defined in Appendix table 2. The standard errors are adjusted for heteroskedasticity and reported in parentheses for each coefficient. \*, \*\*, and \*\*\* indicate 10%, 5%, and 1% level of statistical significance.

<i>Independent Variable</i>	<i>Dependent Variable</i>										
	<i>Change in firm characteristic one year after activism</i>										
	<i>Size</i>		<i>Valuation</i>		<i>Operational Efficiency</i>		<i>Distribution</i>		<i>Investment</i>		<i>Profitability</i>
	MV	Sales	Q	BM	Growth	Cash	DY	Payout	R&D	CapEx	Profit Margin
<i>ATET</i>											
Activism Dummy	-685.6 (741.0)	52.27 (568.0)	-2.139 (1.460)	-0.876 (0.625)	-0.287 (0.393)	-0.227*** (0.0804)	-0.484 (0.383)	-2.552 (4.653)	-0.0765 (0.0847)	1.727*** (0.505)	10.33* (5.692)
# Observations	121	122	118	121	115	51	188	102	97	110	113

**Table 19: Long-term performance of target firms after activism – Cross-sectional analysis**

The following table presents one-year performance in target firms using propensity score approach in the cross-sectional setting. Each target firm is matched with a nontarget firm using propensity score. The dependent variable is a change in the firm characteristic in excess of matching firm in one year after the activism. The independent variable is *Activism Dummy* which takes value 1 if a firm has been targeted in the year before activism. To control for fixed effects, we include firm size both in linear and quadratic form, industry, and year dummies. We winsorize size variable at standard 1%. The standard errors are adjusted for heteroskedasticity and reported in parentheses for each coefficient. \*, \*\*, and \*\*\* indicate 10%, 5%, and 1% level of statistical significance.

		<i>Dependent Variable</i>														
		<i>Change in firm characteristic after one year compared to matching firm</i>														
		Size		Valuation		Profitability		Leverage		Distribution		Investment				
<i>Ind. Variable</i>		MV	Sales	Assets	Q	BM	Growth	ROA	Profit	LEV	ML	Cash	Divid. Yield	Payout	CapEx	R&D
<u><i>ATET</i></u>																
Activism Dummy		1,739.880*	79.750	-757.301	-3.958	2.972*	-1.119	53.456**	12.686	-2.439	-0.385*	-0.418	-0.900	-1.812	1.792	0.010
		(1,041.461)	(293.164)	(466.532)	(4.113)	(1.615)	(0.949)	(21.125)	(11.605)	(1.777)	(0.230)	(0.468)	(0.628)	(7.109)	(17.662)	(0.136)
# Observations		77	121	116	102	91	61	88	78	75	33	117	83	91	61	74

**Table 20: Characteristics of targets in first year post-activism — Time series analysis**

The table reports the characteristics of target firms for the year after activism and compares it with a matching sample based on size/book-to-market/2-digit SIC industry. The sample consists of 551 firms targeted by 112 hedge funds over the period of 2000 to 2013. The Market Value is a firm's stock price times number of shares outstanding and measured in dollars. Sales represent a firm's annual sales in dollars. Tobin's  $Q$  is defined as  $(\text{long-term debt} + \text{the market value of equity}) / (\text{long term debt} + \text{the book value of equity})$ . The Book-to-Market ratio is expressed as the book value of equity/market value of equity. Sales Growth is the annual percentage growth in sales. Book Leverage is defined as  $\text{debt} / (\text{debt} + \text{book value of equity})$ , Leverage is measured total debts / total equity, Market Leverage is defined as  $\text{debt} / (\text{debt} + \text{market value of equity})$ , Cash as a percentage of assets is defined  $(\text{cash} + \text{cash equivalents}) / \text{assets}$ , Dividend Yield is defined as  $(\text{common dividend} + \text{preferred dividend}) / (\text{market value of common stock} + \text{market value of preferred stock})$ , Payout is defined as  $\text{total dividend} / \text{net income before extraordinary items}$ , Capital Expenses are measured as a percentage of assets, Research and Development is measured as a percentage of assets, Profitability is operating profit margin and measured as  $\text{EBIT} / \text{Net sales}$ . The entire set of data is derived from Thomson Reuters DataStream. We report the mean, median, and standard deviation for both target and nontarget samples. Column VII exhibits the difference in medians between the target and matched firm, and column VIII reports the p-value to demonstrate the level of significance in medians. All variables are winsorized at 1%.

Characteristics	Target firms			Matching firms			Median comparison <sup>1</sup>	
	Mean	Median	Sd.	Mean	Median	Sd.	Difference	p-val
Market Value (\$mil.)	982.66	257.78	2,332.29	828.22	194.16	2,032.86	63.62	0.0675
Sales (\$mil.)	880.09	273.44	1,672.67	550.80	66.35	1,172.26	207.09	0.0000
Tobin's $Q$	2.90	1.48	6.28	3.15	1.57	8.42	-0.090	0.4687
Book-to-market	-2.74	0.48	41.01	0.18	0.47	5.63	0.01	0.0000
Growth	1.10	1.02	0.81	1.15	1.07	1.06	-0.05	0.3178
ROA	-0.10	0.03	0.76	-20.42	0.00	74.41	0.03	0.0037
Book Leverage	0.58	0.31	1.77	1.58	0.91	3.74	-0.6	0.0000
Leverage	0.32	0.24	0.41	0.33	0.19	0.71	0.05	0.1913
Market Leverage	0.27	0.21	0.27	0.19	0.03	0.25	0.18	0.0005
Cash (% Assets)	0.14	0.07	0.17	0.30	0.18	0.27	-0.11	0.0000
Dividend Yield	0.46	0.00	1.35	0.01	0.00	0.06	0.00	0.0143
Payout	6.09	0.00	17.19	3.51	0.00	13.55	0.00	0.2740
Capital Exp.	4.14	1.90	6.52	42.86	2.12	99.27	-0.22	0.1573
R&D	0.10	0.01	0.24	0.13	0.01	0.27	0.00	0.0916
Profit	-1.90	0.04	12.07	0.86	1.00	1.93	-0.96	0.0000
Assets (\$mil.)	1,466.47	297.97	4,209.40	906.89	114.48	2,774.57	183.49	0.0001
Liquidity	8.83	2.06	60.39	3.39	2.03	4.63	0.030	0.8697

<sup>1</sup> Wilcoxon signed rank test for differences in medians between the target and the matched firms.

**Table 21: Changes in characteristics in year before and after activism — Cross-sectional analysis**

This table presents the difference in medians of targets and nontargets in year before and after activism. The targets are matched with peers based on size/book-to-market/2-digit SIC industry. The sample consists of 551 firms targeted by 112 hedge funds over the period of 2000 to 2013. The entire set of data is retrieved from using Thomson Reuters Datastream. We report the mean, median, and standard deviation for both target and nontarget samples. Column I and II report the differences in means and medians for targets, column III and IV presents differences in means and medians for nontarget firms. Column V exhibits the difference in change in medians and VI reports the Wilcoxon signrank test p-values to demonstrate level of significance in medians. All variables are winsorized at 1%.

Characteristics	Target firms		Matching firms		Median comparison <sup>1</sup>	
	(After-Before Activism) ΔMean	(After-Before Activism) ΔMedian	(After-Before Activism) Δ Mean	(After-Before Activism) ΔMedian	Δ Difference	Wilcoxon signrank test p-val
ΔMarket Value (mil.)	-5.20	0.00	108.00	76.17	-76.17	0.2565
ΔSales (mil.)	10.87	-5.76	62.88	26.01	-31.77	0.6875
ΔTobin's Q	0.34	-0.070	-1.02	-0.80	0.73	0.0282
ΔBook-to-market	-1.64	0.03	-1.55	-0.04	0.07	0.0085
ΔGrowth	-0.01	-0.02	-5E+14	-0.05	0.03	0.0190
ΔROA	-0.06	0.00	20.24	-0.01	0.01	0.0510
ΔBook Leverage	0.12	0.02	0.55	-0.14	0.16	0.3148
ΔLeverage	-0.51	-0.03	0.08	-0.03	0.00	0.2112
ΔMarket Leverage	0.01	0.02	-0.01	0.03	-0.01	0.7394
ΔCash (% Assets)	-0.01	-0.01	0.00	0.03	-0.04	0.7275
ΔDividend Yield	0.01	0.00	0.01	0.00	0.00	0.8139
ΔPayout	6.09	0.00	-3.34	0.00	0.00	0.7749
ΔCapital Exp.	4.01	1.89	-42.74	-2.11	4.00	0.0108
ΔR&D	0.00	-0.01	-0.01	0.00	-0.01	0.8347
ΔProfit	0.72	0.00	-7.18	-0.99	0.99	0.0000
ΔAssets (mil.)	40.26	-58.64	12.15	5.95	-64.59	0.9341

<sup>1</sup> Wilcoxon signed rank test for differences in medians between the target and the matched firms.



**Table 22: Impact of crisis on target firms performance – time series analysis**

The table reports the difference in medians between two sub-groups in target firms before and after the crisis period. For pre- crisis period, we include all firms targeted during 2000 to 2006. For post-crisis period, we include firms targeted within 2007 to 2013. The data on accounting measures is retrieved from using Thomson Reuters Datastream. We report the mean, median, and standard deviation for both subsamples. Column I to III report the mean, median, and standard deviation for target firms before crisis period, and from column IV to VI mean, median, and standard deviation for target firms during and after crisis period are presented. Column VII exhibits the difference in medians and VIII reports the Wilcoxon signedrank test p-values to demonstrate level of significance in medians. All variables are winsorized at 1%. Firm characteristics are well-defined in Appendix table ??.

Characteristics	Post-crisis target firms			Pre-crisis target firms			Median comparison <sup>1</sup>	
	Mean	Median	Sd.	Mean	Median	Sd.	Difference	p-val
Market Value (\$mil.)	5.77	5.61	2.12	5.27	5.28	1.83	0.33	0.0877
Sales (\$mil.)	5.81	5.91	2.38	5.55	5.70	1.87	0.21	0.0861
Tobin's Q	1.88	1.51	2.08	1.72	1.41	1.17	0.1	0.7609
Book-to-Market	0.58	0.52	1.54	0.53	0.51	1.05	0.01	0.4527
Growth	1.15	1.05	0.62	1.12	1.04	0.44	0.01	0.8995
ROA	-0.22	0.01	1.04	-0.00	0.05	0.20	-0.04	0.0092
Book Leverage	0.54	0.37	1.03	0.47	0.39	0.54	-0.02	0.7567
Leverage	2.74	1.97	2.34	0.31	0.28	0.27	1.69	0.0000
Market Leverage	0.31	0.21	0.30	0.34	0.27	0.30	-0.06	0.2653
Cash (% Assets)	0.68	0.08	2.05	0.70	0.01	2.53	0.07	0.1123
Dividend Yield	0.30	0.00	0.87	0.54	0.00	1.32	0.00	0.0260
Capital Exp.	5.95	2.43	11.72	0.05	0.03	0.07	2.4	0.0000
R&D	0.15	0.02	0.38	0.04	0.00	0.11	0.02	0.0020
Profit	-0.50	0.03	1.80	-0.11	0.05	1.16	-0.02	0.0059
Assets (\$mil.)	6.23	6.34	2.17	5.92	5.93	1.52	0.41	0.0297

<sup>1</sup> Wilcoxon signed rank test for differences in medians between the target and the matched firms.

**Table 23: Impact of crisis on target firms performance — Cross-sectional analysis**

The table reports the difference in medians between two sub-groups in target firms before and after the crisis period in excess of matching sample firms. We compare target firms with matching sample firms based size/book-to-market value/ 2-digit *SIC* industry codes. For pre-crisis period, we include all firms targeted during 2000 to 2006. For post-crisis period, we include firms targeted within 2007 to 2013. The data on accounting measures is retrieved from using Thomson Reuters Datastream. We report difference in means, medians, and standard deviations for both subsamples. Column I to III report the difference in means, medians, and standard deviations for target firms for the period ((2007–13) - (2000–06)) and from column IV to VI difference in means, medians, and standard deviations for nontarget firms for the period during ((2007–13) - (2000–06)). Column VII exhibits the difference in medians and VIII reports the Wilcoxon signedrank test p-values to demonstrate level of significance in medians. All variables are winsorized at 1%. Firm characteristics are well-defined in Appendix table ??.

Characteristics	Target firms			Matching firms			Median comparison <sup>1</sup>	
	$\Delta$ Mean	$\Delta$ Median	$\Delta$ Sd	$\Delta$ Mean	$\Delta$ Median	$\Delta$ Sd	$\Delta$ Difference	Wilcoxon signrank test p-val
$\Delta$ Market Value (mil.)	1.26	1.64	2.89	0.29	0.24	2.43	1.40	0.0164
$\Delta$ Sales (mil.)	1.17	1.21	3.51	1.20	0.81	3.20	0.40	0.8490
$\Delta$ Tobin's Q	0.36	0.29	2.70	-1.12	-0.37	2.97	0.66	0.0023
$\Delta$ Book-to-market	0.56	0.50	1.55	0.51	0.51	1.04	-0.01	0.4679
$\Delta$ Growth	-0.21	-0.05	1.72	-0.11	0.01	1.21	-0.06	0.9916
$\Delta$ ROA	-0.22	-0.01	1.13	-0.03	0.04	0.22	-0.05	0.0860
$\Delta$ Book Leverage	0.52	0.36	1.04	-0.69	0.00	1.89	0.36	0.0000
$\Delta$ Leverage	2.29	1.60	2.49	0.06	0.07	0.41	1.53	0.0000
$\Delta$ Market Leverage	0.10	0.10	0.40	0.17	0.13	0.39	-0.03	0.2419
$\Delta$ Cash (% Assets)	0.43	-0.11	2.56	0.02	-0.11	1.08	0.00	0.4997
$\Delta$ Dividend Yield	0.36	0.00	0.95	0.50	0.00	1.26	0.00	0.1898
$\Delta$ Capital Exp.	4.10	2.37	5.07	-0.03	-0.00	0.14	2.37	0.0000
$\Delta$ R&D	0.02	0.00	0.54	-0.05	0.00	0.22	0.00	0.3841
$\Delta$ Profit	-1.75	-1.10	2.33	-1.32	-0.98	1.86	-0.12	0.8367
$\Delta$ Assets (mil.)	1.16	1.32	2.86	1.14	1.00	2.41	0.32	0.4459

<sup>1</sup> Wilcoxon signed rank test for differences in medians between the target and the matched firms.

**Table 24: Performance of target firms before and after the crisis – Time series analysis**

We regress change in characteristics in firms targeted during 2006 and 2007 after two years of activism (i.e., in years 2008 and 2009) against a set of dummies and vector of control specifications. In vector of dummies we include '*Fund Presence in Year<sub>t</sub>* – is dummy which is equal to 1 if an activist exists in target firm in first year of activism. *Fund Presence in Year<sub>t+1</sub>* – is dummy which takes value 1 if activist fund exists in target firm in second year of activism. *Activist Hedge Fund* – is dummy which is equal to 1 if another activist fund (fund out of sample) targets the firm during 2006 and 2007. In vector of control variables, we include firm size which is measured as natural logarithm of market capitalization. Firm age is measured using Compustat definition; firm year minus year of first stock price and incorporated into the model in natural logarithm form. *Q* and Book/Market value indicate firm valuation, *ROA* and Profit Margin show firm profitability, debt capacity is represented by Book Leverage, firm distribution policy is illustrated by Dividend Yield, and investment in target firm is measured by means of Research and Development, and Capital Expenditure. All regressions control for industry and year fixed effects. The standard errors are adjusted for heteroskedasticity and reported in parentheses for each coefficient. \*\*\*, \*\*, \* indicates the 1%, 5%, and 10% level of statistical significance.

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	<i>Valuation</i>		<i>Profitability</i>		<i>Debt</i>	<i>Distribution</i>	<i>Investment</i>	
<i>Variables</i>	Q	Book/Market	ROA	Profit Margin	Book Leverage	Divid. Yield	R&D	Capital Exp.
Fund Presence in Year <sub>t</sub>	-1.332 (1.431)	1.430 (1.761)	0.711** (0.305)	1.636* (0.865)	0.108 (0.414)	0.264 (0.334)	0.463* (0.227)	0.052 (0.050)
Fund Presence in Year <sub>t+1</sub>	1.086 (0.845)	-0.006 (0.629)	-0.171 (0.178)	-0.215 (0.183)	-0.174 (0.271)	-0.468** (0.178)	-0.338* (0.192)	-0.005 (0.021)
Activist Hedge Fund	-0.571 (0.668)	-1.131 (0.904)	0.120 (0.194)	0.262 (0.282)	0.176 (0.310)	0.070 (0.132)	0.222 (0.199)	-0.017 (0.020)
MV	-0.319 (0.313)	-0.248 (0.477)	-0.091 (0.081)	-0.246 (0.209)	0.167 (0.126)	0.021 (0.075)	-0.044 (0.096)	-0.001 (0.010)
Firm Age	1.546 (1.083)	-1.695 (1.371)	-0.253 (0.201)	-0.784 (0.624)	0.119 (0.266)	-0.534*** (0.184)	-0.096 (0.194)	0.004 (0.025)
Constant	-6.012 (3.495)	5.389* (2.920)	-0.022 (0.463)	0.481 (1.079)	0.240 (0.553)	1.772*** (0.426)	-0.054 (0.572)	-0.105 (0.073)
Industry	Y	Y	Y	Y	Y	Y	Y	Y
Year	Y	Y	Y	Y	Y	Y	Y	Y
Observations	26	30	30	29	30	30	26	30
Adjusted R-squared	0.098	0.355	-0.069	0.168	-0.128	0.525	-0.125	0.184

**Table 25: Performance of target firms before and after the crisis – Cross-sectional analysis**

The table reports the estimates for net change in characteristics in firms targeted in 2006 and 2007 after two years of fund activism (i.e., in years 2008 and 2009) against a set of dummies and vector of control specifications. In vector of dummies we include '*Fund Presence in Year<sub>t</sub>*' – which is equal to 1 if an activist exists in target firm in first year of activism. *Fund Presence in Year<sub>t+1</sub>* – is dummy which takes value 1 if activist fund exists in target firm in second year of activism. *Activist Hedge Fund*– is dummy which is equal to 1 if another activist fund (fund out of sample) targets the firm during 2006 and 2007. In vector of control variables, we include firm size which is measured as natural logarithm of market capitalization. Firm age is measured using Compustat definition which is firm year minus year of first stock price and incorporated into the model in natural logarithm form. We regress two separate models for each firm characteristic; first with industry and year fixed effects, second, without industry and year effects. Variables with subscript *ind* indicates the results without industry and year dummies in regression. *Q* and Book/Market value indicate firm valuation, *ROA* and Profit Margin show firm profitability, debt capacity is represented by Book Leverage, firm distribution policy is illustrated by Dividend Yield, and investment in target firm is measured by means of Research and Development, and Capital Expenditure. The standard errors are adjusted for heteroskedasticity and reported in parentheses for each coefficient. \*\*\*, \*\*, \* indicates the 1%, 5%, and 10% level of statistical significance.

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<i>Independent Variables</i>	<i>Profitability</i>				<i>Valuation</i>				<i>Debt</i>		<i>Investment</i>			
	ROA	ROA <sub>ind</sub>	Profit	Profit <sub>ind</sub>	Q	Q <sub>ind</sub>	BM	BM <sub>ind</sub>	BL	BL <sub>ind</sub>	RD	RD <sub>ind</sub>	CapEx	CapEx <sub>ind</sub>
Fund Presence in Year <sub>t</sub>	0.36 (2.23)	-0.21 (1.12)	4.39* (2.12)	-0.59 (1.71)	0.67 (0.77)	0.23 (0.38)	0.97 (1.01)	0.85 (0.55)	-0.88 (1.03)	-0.81 (0.67)	0.88* (0.45)	0.38 (0.28)	0.11 (0.09)	0.21* (0.10)
Fund Presence in Year <sub>t+1</sub>	-0.84 (1.41)	-0.72 (0.93)	-0.79 (1.43)	0.28 (1.11)	0.18 (0.37)	0.48 (0.47)	0.48 (0.41)	0.53 (0.33)	-0.70 (0.52)	-0.44 (0.41)	-0.45 (0.28)	-0.35 (0.34)	-0.03 (0.05)	-0.03 (0.04)
Activist Hedge Fund	-0.37 (1.10)	-0.01 (0.89)	0.57 (1.44)	-0.98 (1.50)	-0.03 (0.61)	-0.13 (0.35)	-0.39 (0.37)	-0.47 (0.30)	-0.21 (0.73)	-0.31 (0.42)	0.69 (0.58)	0.29 (0.39)	-0.06 (0.05)	-0.03 (0.03)
MV	-0.78 (0.91)	-0.43 (0.51)	-1.67 (1.04)	-0.71 (0.61)	-0.38 (0.57)	-0.24 (0.32)	0.16 (0.24)	0.14 (0.19)	-0.31 (0.31)	-0.36 (0.21)	0.05 (0.31)	0.08 (0.16)	0.01 (0.02)	-0.00 (0.02)
Firm Age	0.84 (1.35)	0.87 (0.98)	-2.67* (1.48)	-0.43 (1.03)	0.12 (0.42)	0.29 (0.46)	0.02 (0.65)	0.18 (0.48)	-0.56 (0.59)	-0.35 (0.42)	-0.42 (0.28)	-0.12 (0.27)	0.08 (0.05)	0.04 (0.04)
Constant	-4.13 (3.84)	-2.52 (2.58)	2.89 (4.70)	0.81 (2.90)	-2.04 (2.85)	-0.93 (1.15)	0.22 (1.58)	-0.28 (1.28)	1.80 (1.55)	1.81 (1.15)	1.28 (1.78)	0.03 (0.69)	-0.37** (0.15)	-0.29** (0.13)
Industry	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Year	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
# Observations	25	25	30	30	30	30	29	29	30	30	26	26	30	30
Adjusted R-squared	-0.30	-0.05	0.11	-0.01	-0.19	-0.01	-0.09	0.10	0.14	0.10	-0.17	-0.03	0.19	0.18

**Table 26: Abnormal returns and types of activism – Impact of large holding in firm**

The table reports the coefficients for types of activism by regressing *CARs* obtained from multiple event-windows. We present type of activism using dummy which takes value one if an activist fund explicitly describes its purpose of the transaction in Schedule 13D filing. Variable 13F is a dummy which is equal to 1 if a fund holds more than \$1 million in target firm before filing Schedule 13D to the SEC of the US. The variable pre-activism return presents the six-months daily average returns' performance prior to Schedule 13D filing. The standard errors are adjusted for heteroskedasticity and reported in parentheses for each coefficient. \*, \*\*, \*\*\* illustrate 10%, 5%, and 1% level of statistical significance.

<i>Independent Variables</i>	<i>Dependent Variables</i>		
	Cumulative abnormal returns on different event-windows		
	CARs (-20, +5)	CARs (-10, +5)	CARs (0, +15)
LMV	0.004 (0.009)	0.000 (0.006)	-0.003 (0.006)
LTD	0.156*** (0.052)	0.038 (0.037)	-0.009 (0.037)
Pre-activism Return	4.594 (4.765)	-0.910 (3.412)	-5.348* (3.412)
13F	0.003 (0.032)	-0.002 (0.023)	-0.021 (0.023)
General Undervaluation	0.072* (0.054)	0.049** (0.038)	0.046* (0.036)
Capital Structure	0.041** (0.076)	0.002** (0.054)	0.053* (0.049)
Business Strategy	0.026** (0.047)	0.023** (0.034)	0.024** (0.032)
Target Sale	-0.027 (0.077)	0.033 (0.055)	0.005 (0.051)
Governance	-0.043 (0.057)	-0.058 (0.041)	-0.058 (0.027)
Chapter 11	-0.056 (0.287)	-0.128 (0.206)	0.352** (0.177)
Industry	Y	Y	Y
Year	Y	Y	Y
Observations	324	324	297
Adjusted R-squared	0.170	0.237	0.100

**Table 27: Size and leverage effect on cross-section of abnormal returns during crisis period**

We regress multiple event-windows against a set of activism types with crisis interaction terms. Types of activism and crisis are presented by means of a dummy. Crisis period covers from July 2007 to December 2013. We do not report vector of control variables which includes size, leverage, average 6-months daily pre-activism returns, Schedule 13F, industry and year fixed effects for the sake of space. Firm size and leverage are in natural logarithmic form and demeaned. The standard errors are adjusted for heteroskedasticity and reported in parentheses for each coefficient. \*\*\*, \*\*, \* demonstrate 1%, 5%, and 10% level of statistical significance.

<i>Independent Variables</i>	<i>Dependent Variable</i>		
	<i>CARs(-20, +5)</i>	<i>CARs(-10, +5)</i>	<i>CARs(-10, +10)</i>
Crisis	0.189 (0.154)	0.128 (0.117)	0.128 (0.117)
General Undervaluation	-0.026 (0.070)	-0.005 (0.058)	-0.005 (0.058)
Capital Structure	0.044 (0.090)	-0.002 (0.109)	-0.002 (0.109)
Business Strategy	-0.014 (0.069)	0.006 (0.048)	0.006 (0.048)
Target Sale	-0.022 (0.085)	0.046 (0.085)	0.046 (0.085)
Governance	-0.056 (0.083)	-0.064 (0.061)	-0.064 (0.061)
Chapter 11	-	-	-
General Value* Crisis	-0.094 (0.116)	-0.102 (0.094)	-0.102 (0.094)
Capital Structure* Crisis	0.011 (0.133)	0.003 (0.127)	0.003 (0.127)
Business Strategy* Crisis	0.148 (0.105)	0.077 (0.082)	0.077 (0.082)
Target Sale* Crisis	0.026 (0.148)	-0.099 (0.124)	-0.099 (0.124)
Governance* Crisis	0.004 (0.128)	-0.019 (0.092)	-0.019 (0.092)
Default* Crisis	-	-	-
General Value* Crisis* MV	-0.027 (0.019)	-0.024 (0.016)	-0.024 (0.016)
Business Strategy* Crisis* MV	0.003 (0.024)	0.010 (0.020)	0.010 (0.020)
Target Sale* Crisis* MV	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Governance* Crisis* MV	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)
Default* Crisis* MV	-0.000 (0.000)	-0.000* (0.000)	-0.000* (0.000)
Capital Structure* Crisis* Lev	0.824*** (0.296)	0.437** (0.215)	0.437** (0.215)
Default * Crisis * Lev <sub>g</sub>	-	-	-
Observations	324	324	324
Adjusted R-squared	0.119	0.185	0.185