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### Hedge Fund Activism and Short Term Price Impacts: From the Perspective of Hedge Funds

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Winston Cheung  
Senior Seminar

## **Hedge fund activism and short term price impacts: from the perspective of hedge funds**

### *Introduction*

Hedge fund activism has been attracting more attention nowadays. On the 14<sup>th</sup> of March, 2016, two democratic senators introduced a bill “that would take aim at activist hedge funds and their ability to act together in “wolf packs” to overtake public companies” (Moyer, 2016). On 4<sup>th</sup> of April, 2016, the U.S. sues ValueAct, which is an activist hedge fund, by saying that “[it] violated Antitrust Law” (Picker, 2016). These are just few of the evidence showing that hedge fund activism is attracting more attention in both the financial and political realm nowadays. Hedge fund activism, defined as hedge funds using their large unregulated pool of capital to take on substantial stakes, usually over 5%, on publicly traded companies, while implementing changes to the way the target firms in hope of making the target firms more valuable in many ways. The existing literature reviews that there is a large bodies of studies that is devoted to finding or disproving the long-term benefits that activist hedge funds bring to the target firms. The proponents of hedge fund activism argue that hedge funds are good catalysts that bring changes to the target firms that are both beneficial to the short run and the long run. However, the opponents of hedge fund activism rebut by saying that the econometric analysis that proponents performed in order to show the long term benefits is fundamentally flawed and that the econometric analysis does not provide meaningful information about the benefits that such activities bring in the long run. Whether hedge fund activism does create value in the long run is still an on-going debate.

Given the context of hedge fund activism, this paper aims to investigate the short-term price impacts that hedge funds induce on target firms, and subsequently examine what are the determinants that drive the short-term price impacts, assuming there is positive price shock. The latter part of the study is considered to be novel to this study as many existing literature are not concerned with what drives the price shocks, or the cumulative abnormal returns.

### *Literature Review*

The following is an extensive literature review on the existing literature by many scholars on the topic of hedge fund activism. But before diving into the crux of this literature review, which is to understand the ongoing debate for and against hedge fund activism, it is imperative to first understand what hedge funds really are, and how they are different from other financial intermediaries. Hedge funds are often misunderstood in many ways and taken as just another alternative investment vehicles for investors to diversify their own portfolios. It is thereby important to first address the differences hedge funds and other financial intermediaries have.

*I. What are hedge funds? How are they different from other financial intermediaries?*

Hedge fund is a type of pooled funds investment vehicle that uses unconventional strategies like derivatives and leverage to achieve active return, usually referred to as alpha,<sup>1</sup> for investors. Over the past two decades, hedge fund remains to be one of the fastest growing alternative investment vehicles in the global financial arena. In 1990, hedge funds had around 39 billion in assets (Getmansky, Lee, Lo, 2015). Despite all the financial crises that took place in the course of the two decades, the hedge fund asset class ballooned to around \$2.5 trillion (Getmansky, Lee, Lo, 2015).

Unlike other traditional investments, alternative investment vehicles like hedge funds remain to be somewhat unregulated in the financial market, which gives hedge fund managers more flexibility in terms of the means to invest to achieve active return. While “unregulated” may be a popular word to describe hedge funds, Connor and Woo (2004, p. 8) describe it as hedge funds structuring themselves in a way to “[take] advantage of exemptions in regulations.”

Hedge funds are different. Even though there is a significant increase in hedge fund activities in the global financial market for the past two decades or so, there remains to be no universal definition of what a hedge fund really is. This certainly underscores the non-transparent nature of hedge funds which will be discussed further later on in this section. A Securities and Exchange Commission (SEC) roundtable took place in 2003 and there were fourteen possible definitions of what a hedge fund is (Vaughan, 2003). Summarizing all the comments from the roundtable, Brav, Jiang, and Thomas concluded that there are four defining characteristics of a hedge fund. The four characteristics are as follow:

*“ (1) they are pooled, privately organized investment vehicles; (2) they are administered by professional investment managers with performance-based compensation and significant investments in the fund; (3) they are not widely available to the public; and (4) they operate outside of securities regulation and registration requirements. More specifically, hedge funds avoid the Investment Company Act of 1940 by having a relatively small number of sophisticated investors” (Brav, Jiang, & Thomas, 2008, p. 1735).*

Other financial intermediaries like mutual funds and pension funds are bounded by relatively more strict regulations that were enacted under the Investment Company Act of 1940 (Hedge Fund Law Blog). However, hedge funds do not fall into the Investment Company Act’s definition of an investment company, which means they are able to make certain investment decisions that are otherwise considered risky or *non-prudent* from a traditional investment standpoint. To better illustrate this point, I should provide few of the many examples of how hedge funds are different from other financial intermediaries like mutual funds. First, as hedge funds are not subject to the Employee Retirement Income Security Act (ERISA) regulations, they are able to hold highly concentrated positions in companies (Brav, Jiang & Thomas, 2008). While portfolio diversification is one of the priorities for mutual funds due to tax laws, hedge funds can operate on high concentration risk in their portfolio to achieve their investment

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<sup>1</sup> Alpha is a commonly used measure to gauge an investment’s performance on a risk-adjusted basis. It is the excess returns of the investment in relation to the underlying benchmark. It is often times a better way to gauge the so-called *excess* returns of an investment

objectives. Second, hedge funds are not constrained by the same liquidity requirements that mutual funds have (Clifford, 2008).

Mutual funds are legally required to have sufficient amount of liquidity in their portfolio in the event of redemption requests from the fund's shareholders (Clifford, 2008; Brav, Jiang & Thomas, 2008). Hedge fund managers, on the other hand, are able to exercise their right to lock-up investors' investment capital "for a period of 2 years or longer" and that hedge fund managers require their investors to inform them well ahead of time if they are going to withdraw their capital from the hedge fund (Brav, Jiang & Thomas, 2008).

The Investment Company Act of 1940 also limits pension and mutual funds managers to reward themselves with "direct performance-based compensation when compared to that of hedge fund managers" (Clifford, 2008, p. 325). On the other hand, hedge fund managers are able to reward themselves with the risk they take by direct performance-based compensation or incentive fee, as many would call it. Typical hedge funds follow the 2-20 rule. They charge their investors 2% as a management fee and 20% on the hedge funds' annualized excess returns (Clifford, 2008). The direct performance-based fee incentivizes hedge fund managers in a way that is very different than that of mutual or pension fund managers (Brav, Jiang & Thomas, 2008). Brav, Jiang, and Thomas (2008) also point out one fundamental difference that sets hedge funds apart from other investment vehicles is that "hedge funds do not sell products to the firms whose shares they hold." This results hedge funds to avoid any sort of conflicts of interest because the investments that hedge funds make are purely for the gains of the managers and the hedge fund itself.

It is also important to distinguish hedge funds from other of similar traits financial intermediaries like private equity and venture capitals. While private equity and venture capitals have fundamental differences in their purposes they serve, private equity and venture capitals focus on the private capital market while hedge funds focus on the public equity market (Brav, Jiang & Thomas, 2008). Due to the unique structure and nature of hedge funds, many legal scholars, including Clifford, argue that "hedge funds may have better incentives to monitor a firm's management and board than previously studied financial intermediaries" (Clifford, 2008).

## *II. What is shareholder activism? What is hedge fund activism?*

Hedge funds, nowadays, can be separated into four main categories, namely equity, event-driven, relative value, and macro hedge. Activist hedge fund falls into the even-driven subcategory. In particular, a report, published by J.P. Morgan Corporate Finance Advisory, suggests that "no recent development has influenced firms' strategic and financial decision-making as profoundly as the surge in shareholder activism following the global financial crisis" (Zenner et al., 2015, p. 1). Having said that, shareholder activism is nothing new in the financial sector. In fact, the "closest ancestors to hedge fund activists" can be traced back to the 1980s when activist shareholders targeted poorly performing companies and invest in them which resulted in improvements in shareholder value and profitability (Brav, Jiang, & Thomas, 2008).

There has been a steady surge of shareholder activism for the past decade. The surge is even more pronounced ever since the global financial crisis in 2008. The J.P. Morgan report

shows that there were less than \$12 billion of assets under management (AUM) in the activist asset class. It has now grown into an asset class with more than \$112 billion in assets (Zenner et al., 2015). Further, the authors of the J.P. Morgan report identify few of the main drivers of the growth in this activist asset class. They include, but not limited to, the low interest rate environment, lazy balance sheets and low returns in the fixed-income markets (Zenner et al., 2015). The aftermath of the global financial crisis has perhaps resulted in investors seeking for an alternative investment vehicle for higher returns, which explains the surge in this particular asset class since the crisis.

In the broader sense, activism “represents a range of activities by one or more of a publicly traded corporation’s shareholders that are intended to result in some change in the corporation” (Shareholder Activism: Who, What, When, and How?, 2015). In particular, hedge fund activism is what Cloyd (2015) refers to as the asset class that is at “the most assertive end of the spectrum” (Shareholder Activism, 2015). Hedge funds will utilize their large, unregulated pool of capital from several wealthy investors to acquire a significant stake in different companies, often referred to as target firms, in order to implement changes in those target firms in hopes of generating excess returns, or alpha as previously mentioned. The specific tactics that different activist hedge funds to implement changes vary, but the common tactics that hedge funds managers use “fall within the category of capital allocation strategy” (Shareholder Activism, 2015).

One important question remains unanswered is why target firms became target firms in the first place. Activist hedge funds generally do not target well-performing companies just because its more challenging that way to bring about a change in the company in order to result in a significant increase in the shareholder value. We can therefore say that activist hedge funds target under-performing and inefficient companies. The J.P. Morgan specifically presents five common themes of why companies get targeted by hedge funds in the first place. They are namely, underperformance, poor capital allocation and lack of corporate clarity, corporate control, and governance (Zenner et al., 2015). Typical target firms do embody some, or all, of the traits mentioned above. The key takeaway is that activist hedge funds target firms with poor performance with very “lazy” balance sheets, meaning they have “excess cash, unused debt capacity, and non-core assets” (Zenner, Gosebruch, Berkovitz, 2010, p. 4).

### *III. How do hedge funds actively engage in a target firm?*

Depending on the context of the literature and the purpose of different empirical studies, the exact definition of hedge fund activism may vary. For the purpose of this literature review, a hedge fund is considered to be active whenever the hedge fund has accumulated, in total, more than 5% of the target firm. The threshold of 5% is more than just a random number. In fact, it is required by law by the Securities and Exchange Commission (SEC) that whenever “a person or group of persons acquires beneficial ownership of more than 5% of a voting class of a company’s equity securities,” that person or group of persons are required to file the Schedule 13D with the SEC within the ten days after the hedge funds have reached that 5% threshold (SEC). Beneficial ownership is an important jargon for the definition of activism because it means that the person or group of persons “has the power to vote or influence the transaction decisions regarding a specific security” (Investopedia, 2016). Also, Schedule 13D is unique in a

way because the filing of a 13D means that the hedge fund(s) has the intention to actively engage in the target firm in different ways. The purpose of the transaction is explicitly laid out under the Item 4, which is the Purpose of Transaction, in the Schedule 13D. I have retrieved a schedule 13D filed by Atlantic Investment Management, Inc. from the SEC EDGAR<sup>2</sup> database to illustrate the unique nature of the 13D. Atlantic Investment Management, Inc., has accumulated 5.1% of the company Oil States International, Inc. as of the 1<sup>st</sup> of December, 2014. Under the Item 4, it states that Atlantic Investment Management, Inc., aims to “[pursue] an investment objective that seeks capital appreciation” (SEC 13D, CUSIP Number: 678026105).

While the Schedule 13D is considered to be the definitive evidence of hedge fund activism across all literature, since hedge funds are very non-transparent and secretive of what they actually do, Schedule 13G does reveal a subset of activism data. Very similar to Schedule 13D, an investor or a group of investors are legally required to file the Schedule 13G whenever they have accumulate more than 5% of the company. However, one important caveat that pertains to the Schedule 13G is that it does not indicate that the investor(s) is trying to actively engage in a target firm. Instead, it means the opposite. Schedule 13G indicates that the investor(s) does not have the intention to exert any kind of control or influence in the company at all. The accumulation of 5% or more simply serves as an investment purpose, which is oftentimes considered as passive investment rather than active (Clifford, 2008, 326).

#### *IV. Proponents and Opponents of Hedge Fund activism*

For such secretive, and seemingly non risk-averse financial intermediary to actively engage in many companies and implement changes is something that has been attracting more attention and scrutiny nowadays. Not only are people more conscious of the risk the financial market is bearing ever since the global financial crisis in 2008, there is also huge policy implications as to how policymakers will try to monitor and exert more control on these highly non-transparent and unregulated financial activities. For the following section in this literature review, I will be presenting the two prevailing arguments, both for and against, pertaining to hedge fund activism.

##### *IV(A). Proponents of Hedge Fund Activism*

One of the most recognized and extensive empirical studies in the field regarding hedge fund activism is the paper “The Long-Term Effects of Hedge Fund Activism,” which is written by Lucian A. Bebchuk, Alon Brav, and Wei Jiang. They are amongst the more active scholars out there who feel very strongly about the positive long-term effects that hedge fund activism brings to shareholders. In this study, they conduct a systematic empirical investigation on the claim that activist hedge funds are “myopic-activist,” meaning activist hedge funds are very near-sighted.

At this juncture, a brief overview of the other side of the argument, which is against hedge fund activism, seems to be in order. The claim that activist hedge funds are myopic agents are based on the premise that the activist interventions by hedge funds have a value-decreasing

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<sup>2</sup> SEC EDGAR stands for SEC Electronic Data Gathering, Analysis, and Retrieval. It is a massive database under the SEC for the public to retrieve more than 20 million filings across the U.S.

instead of value-increasing effect to the target firms in the long-term even though target firms experience positive increase in market valuations in the short term (Bebchuk, Brav, & Jiang, 2015). In line with this myopic-activist claim, William George, a Harvard Business School professor and a director at Goldman Sachs asserts that “activists cloak their demands in the language of long-term actions, their real goal is a short-term bump in the stock price. They lobby publicly for significant structural changes, hoping to drive up the share price and book quick profits. Then they bail out, leaving corporate management to clean up the mess” (“Activists Seek Short-Term Gain,” 2013).

Given the brief overview of the opposing view of hedge fund activism, Bebchuk, Brav, and Jiang conduct analysis using a dataset, which comprises of 2,040 Schedule 13D filings between 1994 to 2007. The key focus of this study, like many others, is whether the interventions will lead to change in the target firms’ operating performance. The two metrics that the authors use to gauge the change in operating performance are return on assets (ROA) and Tobin’s Q, or simply the Q Ratio. Their key findings from the 2,040 activist interventions are as follow. First, they find no evidence that short-term gains come at the expense of “subsequent long-term declines in operating performance” (Bebchuk, Brav, & Jiang, 2015, p. 1117). In fact, each year after the intervention, up to five years, the operating performance of target firms experienced improvements, which are statistically significant. Bebchuk, Brav, and Jiang further their investigation by addressing critics’ stock-picking argument. Simply put, the stock-picking argument follows the logic that hedge funds are not actually improving the operating performance of target firms but merely choosing targets that are expected to improve with or without the intervention (Bebchuk, Brav, & Jiang, 2015). Bebchuk, Brav, and Jiang address this argument by stating that this investigation is not to find the causal link between hedge fund activism and positive long-term effects on target firms but that it is to empirically test whether short-term gains are followed by long-term operating performance declines is at all substantial.

The findings in the Bebchuk, Brav, and Jiang’s piece are in many ways consistent with other literature as well. Another empirical study, “The Real Effects of Hedge Fund Activism: Productivity Asset Allocation, and Industry Concentration,” written by Alon Brav, Wei Jiang, and Hyunseob Kim, investigates yet and again the long-term effects of hedge fund activism. However, this study is different in a way that the authors investigate the long-term effects by focusing on the productivity of target firms using plant-level information. Instead of using firm-level information to gauge the effects of activism, which is what the authors of the previous study did, using data from manufacturing plants owned by target firms will help eliminate the effects of survivorship bias<sup>3</sup>. The findings from this empirical study is generally consistent with the one conducted by Bebchuk, Brav, and Jiang in the sense that there is long-term improvements in operating performance in target firms several years after the intervention (Brav, Jiang, & Kim, 2013). The authors of this study also investigate the effects of product market concentration on activism, which has not been done in the previous study. By using the Herfindahl-Hirschman Index (HHI) to gauge the market product concentration of different industries, the authors find that the improvement of total factor productivity (TFP) in the

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<sup>3</sup> A lot of the commonly used databases, like Compustat, do not include data of target firms when other competitors either acquire them or they are simply not in business. This has been a big confounding factor to many other studies as the true post-intervention operating performance of target firms cannot be studied thoroughly, contributing to the survivorship bias.

manufacturing plants, owned by target firms, is more significant in the less concentrated industries (Brav, Jiang, & Kim, 2013). This is due to the fact that highly concentrated industries face relatively inelastic demand curves which result in less gains from the increase in the productivity of the manufacturing plants (Brav, Jiang, and Kim, 2013, p. 14). Overall, the results show very positive effects of hedge fund activism and that it “facilitates improvements in terms of both production efficiency of assets-in-place and capital reallocation” (Brav, Jiang, & Kim, 2013, p. 27).

The empirical study done by Christopher P. Clifford, “Value creation or destruction? Hedge funds as shareholder activists?,” follows the similar route similar to the Bebchuk, Brav, and Jiang’s empirical study, which is to examine the long-term effects of hedge fund activism on target firms. However, there are few fundamental differences in this study that is worth noting. As the previous studies focus on analyzing the effects using the Schedule 13D as the dataset, Clifford also includes a control group that comprises of the Schedule 13G. The inclusion of a control group of Schedule 13G is to help “isolate the effects of shareholder activism, insofar as selection ability is the same across filing types” (Clifford, 2008, p. 324). There are several key findings I wish to highlight. First, Clifford finds that there is a high level of specialization in a specific industry when hedge funds decide to actively engage in target firms. Clifford finds that there is approximately 21% of the hedge funds in his sample focus in only one industry (Clifford, 2008, p. 327). This implies that the choice of target firms is highly dependent on the expertise of the hedge fund managers. Second, Clifford finds no substantial evidence to back the argument that activist hedge funds “raid” target firms cash (Clifford, 2008). With the 13G as the control group, Clifford’s findings are particularly meaningful when he looks at the short-term price impacts comparing the “active blockholders,” 13D, and the “passive blockholders,” 13G. He reveals that the market does favor the filing of 13D more than it is for 13G; there is more significant excess returns when a hedge fund files for 13D compared to 13G (Clifford, 2008).

#### *IV(B). Opponents of Hedge Fund Activism*

One of the biggest opponents of hedge fund activism is perhaps the renowned American lawyer, and one of the founding partners of the law firm of Wachtell, Lipton, Rosen & Katz, named Martin Lipton. There are many instances where Lipton openly criticizes the irresponsible actions that activist hedge funds take on American firms. Amongst those criticisms, the blog post on the Harvard Law School Forum, named “Important Questions about Activist Hedge Funds,” is perhaps the most well-known criticism in the field that discredits the long term effects that activist hedge funds bring to target firms. Lipton writes, “In what can only be considered a form of extortion, activist hedge funds are prettying on American corporations to create short-term increases in the market price of their stock at the expense of long-term value” (Important Questions about Activist Hedge Funds, 2013). There are many questions that Lipton raised in the blog that challenge the very fundamental premise and motive of hedge fund activism. One of the questions is whether the so-called value creation that many scholars claim to be “statistically significant” in their studies to be true, or merely value that got appropriate from other stakeholders like employees or other investors of longer investment horizon like bondholders (Important Questions about Activist Hedge Funds, 2013). Although Mr. Lipton did not provide many regression analysis or data to support his argument, the concerns he raised in the blog is



somewhat sobering; a lot of the empirical studies are too focused on the returns on stockholders and that negates a lot of the spillover effects that hedge fund activism has on other stakeholders, like employees. Lipton criticism does not stop there. In another blog post on the Harvard Law School Forum, Lipton directs his argument to Professor Bebchuk that, “he must first put forth a persuasive theory as to why the judgments as to corporate strategy and operations of short-term-focused professional money managers should take precedence over the judgments of directors and executives charged with maximizing the long-term success of business enterprises” (Bite the Apple; Poison the Apple, 2013). Even though Mr. Lipton’s argument is not as substantial in the sense that it is not filled with econometric analysis and statistics, he raises important questions that never got answered in previous studies. The revolving theme in many of Lipton’s argument is that investors need to look at the bigger picture, but not just the excess returns and slight improvement in the operating performance of the target firms.

There are also handful of studies that focus on how activist hedge funds are not value creator in the long run. A report called “Activist hedge funds “creators of lasting wealth? What do the empirical studies really say?,” written by Yvan Allaire and François Dauphin, openly critiques on the study done by Bebchuk, Brav, and Jiang. While Bebchuk, Brav, and Jiang conclude that there are lasting wealth creation effects from their empirical findings, Allaire and Dauphin argue otherwise. One of the problems that Allaire and Dauphin point out in their report is that econometric analysis can never “capture the nuances of every situation” (Allaire and Dauphin, 2014, p. 6). Although Bebchuk, Brav, and Jiang does address the question of causality in their study, Allaire and Dauphin critiques that the improvements in operating performance cannot be attributed to the interventions. In addition, Allaire and Dauphin point out that the hedge funds were only engaged in their target firms for less than nine months, but to analyze the operating performance in five years post-intervention is in no way meaningful. On the appearance, this seems to be a good point that Allaire and Dauphin make; however, I personally do not agree with this point they are trying to establish. The premise of hedge fund activism is that hedge funds engage in target firms, implement changes and subsequently exit the investment with the hopes of those changes will bring long-term improvements. Just because the hedge funds are no longer active in target firms does not mean the long-term improvements cannot be attributed to the interventions by hedge funds. That being said, Allaire and Dauphin do point out some meaningful points from their assessment of the Bebchuk et al. paper. Although the results are claimed to be “statistically significant,” which merely means the results are not zero, are the results in any way significant in real life remains to be the question.

Following the report by Allaire and Dauphin, the empirical study, “The Impact of Hedge Fund Activism on the Target Firm’s Existing Bondholders,” done by April Klein and Emanuel Zur takes a closer look to the claim of activist hedge fund having significant wealth creation effects. Much of the studies discussed previously focus on the supposedly wealth creation effects on shareholders, and it is empirically proven that there is positive significant wealth creation effects on shareholders. But this study specifically focuses on bondholders and the conclusions are not consistent with what other scholars have found. Klein and Zur compile a set of comprehensive data of corporate bonds for U.S. that are targeted by activist hedge funds between 1994 to 2006. In short, they find that there was negative excess returns on bondholders when hedge funds filed for the Schedule 13D and that the negative excess returns persist after a year of the intervention. I find this study very interesting and groundbreaking in many ways.

Not only is this the first literature that discusses the bondholders, which is of huge significance to any companies' capital structure, but that it also dismisses the claim of wealth creation. The finding is consistent with the "proportionately large number of rating downgrades for the target firm's bonds, suggesting that the bond market both anticipates and reacts to the increase in default risk" (Klein and Zur, 2011, 1736). If the firms are how the other authors claimed to have significant increase in operating performance, shouldn't the bond market react positively to that? The negative impacts on bondholders not only disprove the claim of wealth creation but that it shows how long term investors like bondholders value these activities in the long run. While many studies previously have the underlying implication of hedge fund activism being a positive sum game, it is simply not consistent with what we can see with losses the bondholders bear.

### Methodology

Since this study concerns with how different aspects of a hedge fund will impact the target firms in the very short term through activism, whether it is a D or G, I have chosen to include three independent variables namely, the size of the hedge fund at that time, the size of the acquisition, and whether that acquisition is a D or G which will be captured by a dummy variable with 1 denoting a 13D filing and 0 denoting a 13G filing. As for the dependent variable, I chose to use cumulative abnormal return (CAR) as a proxy variable to gauge the short-term price impacts of the intervention. In fact, the use of CAR to gauge the short-term impacts of certain events is a common practice in the field of financial economics (add in literature). As this dataset will neither be a time series nor a panel data, each event will be treated as a separate event, resembling the framework of an event study<sup>4</sup>. The concept of CAR will be discussed more in-depth later in this paper.

I began this study by specifying the time period that I will use to collect data. Although there is an abundance of data available online from databases like SEC EDGAR and SECInfo, I chose to focus on the time period from 2010 to 2016 due to how the year of 2010 is viewed as the start of a new era or a structural break for the economy, especially in the U.S., after the global financial crisis in 2008. Therefore, incorporating the years during the crisis would not be a prudent way to conduct this study as data maybe skewed or biased in certain ways that would cloud the results. Afterwards, I proceeded by selecting the hedge funds I will be using to identify the data or events. An event is defined as when a hedge fund takes on either an active or passive stance, 13D or 13G respectively, at a target firm on a specific date. The events in this study will only include the initial filing of either the 13D or 13G by hedge funds, the subsequent amendments of the 13D or 13G, which is shown as 13D/A or 13G/A with “A” denoting Amendment, will not be included in the dataset.

At this point, it is important to make note of the way I am selecting the scope of the dataset. While it only seems logical to include every filing of 13D or 13G that was submitted to the SEC from 2010 to 2016 by hedge funds, it is a task that is too time-consuming by itself. In order to illustrate my point, I will first need to use the third party database called SECInfo<sup>5</sup> to filter the 13D and 13G filings for the 5-year period. The 13D filing alone, for the 5-year period, there are over 10,000 filings, which is very similar to 13G. The filings will then needed to go through another manual filtering process to filter out all the events that were not filed by hedge funds, but other financial intermediaries like pension funds or mutual funds. This is in fact the way that was done in many literature discussed previously. The researchers will have to identify which filers are hedge funds based on outside research and news. This is especially more difficult due to how many hedge funds do not identify themselves as hedge funds but names like investment management, or capital management etc. Due to the very time-consuming nature of this task, I have decided to randomly select activist hedge funds based on various news sources and use their names to filter out the relevant filings throughout the time period from 2010 to 2016. This is not to say that I do not acknowledge the tradeoff that comes with this particular

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<sup>4</sup> Event study is an empirical study performed to examine the effects of certain events that have led to an either positive or negative impact on the value of the security in the very short run. (Investopedia, 2016)  
<http://www.investopedia.com/terms/e/eventstudy.asp>

<sup>5</sup> SECInfo:

data sourcing method. Based on the news sources<sup>6</sup>, I have selected 9 hedge funds of different sizes, based on their AUM reported in the latest 13F filing, which I will go more in-depth later in this paper. With the selected 9 hedge funds, I started collecting data by extensively using the SECInfo database. While all the filings that are filed with the SEC are made available to the public through the SEC EDGAR database, it is not necessary the most intuitive and user-friendly database. SECInfo, on the other hand, does provide easier searches and better filters to enable users to filter through the information they are seeking for.

After collecting all the relevant information from the filings, both 13D and 13G, from 1/1/2010 to 2/16/2016, there are in total 172 events. However, the data on one of the independent variables, the size of the hedge fund, is not collected through the 13D and 13G filings. In fact, the size of the hedge fund, determined by the asset under management (AUM), is found in the 13F filings. It is a filing that is filed quarterly by any institutional fund or money managers that have over \$100 million USD worth of qualifying assets. Since it is filed quarterly, the exact figure for AUM on the filing date of either the 13D or 13G is not known. The size of the hedge fund around that filing date is approximated by taking the closest quarterly-reported AUM figure. Take the case of Palo Alto Investors LLC for an example. Palo Alto Investors LLC filed a 13G on the 16<sup>th</sup> of February, 2016. The AUM for Palo Alto Investors LLC around that time will be taken from the figure reported through the 13F reported on the 31<sup>st</sup> of December, 2015 (the fourth quarter of 2015).

As for the cumulative abnormal return (CAR), the dependent variable for this study, requires a more sophisticated process to derive it. As the name suggests, CAR is a measure of the sum of the abnormal returns, or excess returns, over a certain time period. While there are many ways to compute CAR<sup>7</sup>, I will use the simplest method, which is called the market-adjusted return model. Compared to the market model, one of the most common ways to calculate CAR, “the market-adjusted return model can be viewed as a restricted market model” (MacKinlay, 1997, p. 18). But before I can calculate the CAR for every event I have collected, 172 of them, I will need to determine the appropriate event window for the CAR. In short, the event window is the days surrounding the event, the intervention of either a 13D or 13G in this case, and by factoring the abnormal returns of both the days before and after the event, the CAR can better gauge how the market reacts to the interventions induced by hedge funds. As I am interested in the short-term price impacts of the interventions, I have chosen a 3-day event window. Let  $t=0$  be the date of the event. The date of the event is defined as the date when the hedge funds filed the 13D or 13G with the SEC. This filing date should not be confused with another date that is shown in all of the 13D or 13G filings, which is called “Date of Event Which Requires Filing of this Statement.” As we recall from the previous literature, investors have a buffer time to file either a 13D or 13G after they have acquired a 5% stake in a publicly traded company; 10 days for 13D and 45 days for 13G.

The 3-day event window can be denoted as -1, 0, +1 with -1 being the trading day before the event and +1 being the trading day after the event. It is important to note that they are trading days but not just the day before the day of intervention. If the day before a particular

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<sup>6</sup> Three news sources include, hedgetracker, activistinsight, carriedin

<sup>7</sup> The few common ways to compute the CAR include the constant mean return model, the market model, capital asset pricing model (CAPM), and arbitrate pricing theory (APT)

event is a Sunday or a holiday, then -1 is the closet trading before the event, which is a Friday (assuming Friday is not a public holiday).

As the market model is given,

$$R_{it} = \alpha_i + \beta_i R_{mkt} + \varepsilon_{it} \quad (1)$$

the market-adjusted return model assumes that the  $\alpha_i$  to be zero and the  $\beta_i$  to be one at all times. Simply put, the market-adjusted return model basically measure the abnormal return of that particular security by taking away the so-called normal return, yielded by the market on that particular day. The abnormal return of that security of a particular target firm on a specific given date will be,

$$AR_{i,T} = R_{i,T} - R_{M,T} \quad (2)$$

where  $R_{i,T}$  is the return of a particular security during a day and  $R_{M,T}$  is the return of the market, a particular index, during a day. Both the return of the security and the return of the market are calculated the same way as follow:

$$\text{same day return} = \frac{\text{close price} - \text{open price}}{\text{open price}} \times 100$$

As for the return of a particular security, or target firm's stocks, I used both the Google Finance and Yahoo Finance to collect the data on the asset prices on the respective 3-day event window. At the same time, I have identified which stock exchange each of the target firm is listed on, whether it is NASDAQ, NYSE or NYSEMKT. This is particularly important as identifying which stock exchange each target firm is listed on provided me the basis on which index, NASDAQ Composite, NYSE Composite, to collect data from to calculate the return of the market.

The abnormal returns of the 3-day event window of each event, (-1, 0, +1), is calculated for every single event. However, there are 23 events that I was unable to collect data on due to how they were delisted from the stock exchange for numerous reasons. One of the main reasons is that many of the target firms are acquired or merged with some other companies some time after the interventions by the hedge funds and that they were no longer listed on the stock exchange. This results in 149 events after excluding the 23 events that I was not able to collect data on. This is in fact an issue that was extensively discussed in one of the literature that was previously discussed. The empirical study, "The Real Effects of Hedge Fund Activism: Productivity Asset Allocation, and Industry Concentration," by Brav, Jiang, and Kim discuss how previous research cannot address the problem of "survivorship bias in the post-intervention period" (Brav et al., 2013, 2). Likewise in this study, it does suffer from the same problem as firm-level data is non-existent in databases after they were taken off the database. Of the 172 events, there is approximately 13% of firms "disappeared," which may potentially pose a problem in my empirical results.

The next step is to calculate the cumulative abnormal return (CAR), which is simply to add up all of the abnormal returns on the 3-day event window across all 149 events over the 5-year period. With that, the regression model for this study is as follow:

$$CAR_i = \beta_0 + \beta_1 \text{active}_i + \beta_2 \text{size}_i + \beta_3 \text{aum}_i + \varepsilon_i \quad (3)$$

where, CAR = Cumulative Abnormal Return (%)

active = dummy variable, 1 being a 13D, 0 being a 13G

size = the size of the acquisition by hedge funds (%)

aum = the size of the hedge fund (based on closest quarterly reported aum) in millions

For this study, I will be using Stata to execute all the statistical analysis.

### Results

The results of the statistical analysis using the model above will be presented here. First, Table 1 exhibits the descriptive statistics of the collected data.

Table 1. Descriptive statistics of the collected data

<b>Variable</b>	<b>Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Min</b>	<b>Max</b>
CAR	149	3.324161	14.57633	-26.36	107.89
active	149	0.3557047	0.4803409	0	1
size	149	8.230101	3.84565	2.49	34.61
aum	149	4105.192	29.98	29.98	19311.96

One of the first tests that I conducted in this study is running both a one-sample and two-sample t-tests on the CAR. The one-sample t-test tested whether the CAR is statistically different from zero. The null hypothesis for the one-sample t-test is: the mean for the CAR is 0. As Table 2 shows, the p-value for the mean not equal to zero is 0.0061, which is far below the alpha of 0.05. This means that the CAR for the 149 events is statistically different from zero at the 5% level of significance. The p-value for the mean greater than zero is 0.0030, which suggests that there is strong evidence that the CAR is greater than zero at the 5% level of significance. The one-sample t-test does results that show how there are positive abnormal returns on target firms on the 3-day event window.

Table 2. One-sample t-test, Stata output

```
. ttest car==0
```

One-sample t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
car	149	3.324161	1.19414	14.57633	.9643949	5.683927

mean = mean(car) t = 2.7837  
 Ho: mean = 0 degrees of freedom = 148

Ha: mean < 0 Ha: mean != 0 Ha: mean > 0  
 Pr(T < t) = 0.9970 Pr(|T| > |t|) = 0.0061 Pr(T > t) = 0.0030

As for the two-sample t-test, it is to test whether the mean of CAR by a 13D filing is different from the mean of CAR by a 13G filing. This t-test is particularly important to this study as this will indicate whether the market, or investors, do value a 13D and a 13G filing differently. The null hypothesis for this two-sample t-test is: the mean of CAR by a 13D is the same as the mean of CAR by a 13G. As Table 3 shows, the p-value for the alternative hypothesis of the difference of two means equal to zero is 0.2088, which is greater than the acceptable value of alpha of 0.05. The p-value of the other alternative hypothesis of the difference of two means less than zero is 0.1044. Both of the results are above the alpha of 0.05 which means I failed to reject the null hypothesis that the null hypothesis. These results imply that the mean CAR induced by a 13D filing is not statistically different than the mean CAR induced by a 13G filing.

Table 3. Two-sample t-test, Stata output

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	96	2.175	1.435684	14.06678	-.675194	5.025194
1	53	5.40566	2.111808	15.37419	1.168008	9.643313
combined	149	3.324161	1.19414	14.57633	.9643949	5.683927
diff		-3.23066	2.55361		-8.297238	1.835917

diff = mean(0) - mean(1) t = -1.2651  
 Ho: diff = 0 Satterthwaite's degrees of freedom = 99.5361

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0  
 Pr(T < t) = 0.1044 Pr(|T| > |t|) = 0.2088 Pr(T > t) = 0.8956

I applied a linear regression model to examine the relationships between the CAR and the three independent variables, namely active, size and aum. Table 4 shows the results of the regression analysis. To start with, the p-value of the f-statistic is 0.0616, acceptance level of  $\alpha = 0.05$ , shows that the overall model does not exhibit a strong overall significance. Similar to t-tests, the f-test examines all the coefficients all at once and find the strength of the model. Although this does not suggest an overall strength in the model, it is close to the desired threshold. As for the R-squared, it is in a relatively low value of 0.0493 suggesting that the regression line does not closely model the data collected. The R-squared value of 0.0493 suggests that the regression model only explains 4% of the data collected in the model. This is potentially due to way the data was collected, which was discussed before. The fact that the 149 events are nowhere close to being exhaustive of all the events that took place between 2010 and 2016 is perhaps the problem that confounds the model and the R-squared value.

The coefficient values are the estimates of betas ( $\beta$ ) from the regression model. The coefficient of the variable *active*, 2.926, with the p-value of 0.237 indicates that the coefficient is not statistically significant. Same case goes to the variable *size*, with a coefficient of -0.093 with a p-value of 0.765, indicating a very weak statistical significance. The coefficient of the variable *aum*, 0.0007957, is the only coefficient that is significant at the 1% level, with the p-value of 0.017. This suggests that for every 1 million increase in the AUM of the hedge fund at a certain time, there is approximately a 0.0008% increase in the CAR of that event.

Table 4. Regression, Stata output

```
. regress car active size aum
```

Source	SS	df	MS	Number of obs	=	149
Model	1548.89279	3	516.297597	F(3, 145)	=	2.50
Residual	29896.5842	145	206.18334	Prob > F	=	0.0616
Total	31445.477	148	212.469439	R-squared	=	0.0493
				Adj R-squared	=	0.0296
				Root MSE	=	14.359

  

car	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
active	2.926183	2.464738	1.19	0.237	-1.945272 7.797637
size	-.0925661	.3091359	-0.30	0.765	-.7035607 .5184284
aum	.0007957	.0003309	2.40	0.017	.0001416 .0014497
_cons	-.2212481	3.150139	-0.07	0.944	-6.447371 6.004875

To test for multicollinearity, I have conducted a test that test for multicollinearity, the phenomenon that independent variables are highly correlated with each other. Table 5 shows that the values for the variance inflation factor (VIF) are all significantly below the value of 5, the acceptance level, which means that independent variables are not likely to be correlated to one another.



Table 5. Test for multicollinearity, stata output

```
. estat vif
```

Variable	VIF	1/VIF
size	1.01	0.985720
aum	1.01	0.987364
active	1.01	0.993920
Mean VIF	1.01	

### Discussion

The results have given us some insights regarding the short-term price impacts that hedge funds induced. To start with, the one-sample t-test provided us the statistically significant results about the CARs of the 3-day event period. This indicates that the interventions by hedge funds do seem to induce positive abnormal short-term price shocks to the target firms. This finding is very much in line with what other scholars have found in their studies. The study called “Value creation or destruction? Hedge funds as shareholder activists”, written by Christopher Clifford, does seem to show similar results. In his study, with a 5-day event window, he uses a market model return to compute the CARs. Not only was he able to find that there is positive abnormal returns for both 13D and 13G filings that are statistically significant at the 1% level, with 13G having significantly lower CARs than 13D, Clifford was able to find that the difference of CARs between 13D and 13G is also statistically significant at the 5% level. The latter of Clifford’s finding is what I was not able to find here in my study. While one of the factors, as discussed previously, about not being able to find significance in the difference between the CARs induced by 13D and 13G is due to the way the dataset was sampled, yet another potential factor is the way the CAR was computed. Like many other literature, the conventional way to compute CAR is by using the market model, which is stated in equation (1). The fact that I used a market-adjusted return model does seem to confound the results because the market-adjusted return model does not take the volatility of the individual stock compared to the benchmark or index.

As for the regression model, two of the coefficients of the variable *active* and *size* are not statistically significant but that there is still some to infer from the signs, whether it is positive or negative, of the coefficients. As for the dummy variable, *active*, it is a positive coefficient, which implies that the mean CARs induced by 13D filings would be approximately 3% higher than it is for 13G filings. Although the p-value for this dummy variable is 0.237 which is far from being statistically significant, the positive sign for the coefficient of the dummy shows that the model does seem to show or exhibit a very general trend of how CARs are different, due to 13D or 13G, that is similar to previous literature. As for the coefficient for the *aum*, which has a value of 0.0007957 that is significant at the 1% level, it implies that there is a positive relationship between the AUM of the hedge fund and the magnitude of the CARs. To recall, the coefficient of 0.0007957 means that for every 1 million increase in the AUM of the hedge fund, there is approximately 0.0008% increase in the mean CARs. One explanation for this phenomenon is that investors value the effort of larger hedge funds on target firms, which is

subsequently reflected in the higher price, a higher mean CAR from the 3-day event window. At the same time, this coefficient can be better explained in a different way. Rather than speculating this is the result of investors pricing in the information of the size of the hedge fund, it can be potentially due to how bigger hedge funds have larger pools of capital to take on bigger stakes in the target firms, driving up the price following the event date.

Although the coefficients from the regression do not provide many insightful points about how different determinants of each intervention, the fact that the coefficients are “not meaningful” say something about how the market view these interventions. As there are no obvious relationships between the dummy variable of whether it is a 13D or 13G, the size of the acquisition, can imply that the market, or investors, does not view these variables as important determinants. This, coupled with the fact that the t-test shows that the CARs are statistically different than zero at the 1% level of significance, shows that the market does view these interventions as positive signals, as reflected in the positive abnormal returns, but the market is not concerned with the details of the intervention. Whether it is a 10% or 5% acquisition of a target firm does not influence how the market reacts towards that event.

Also, the fact that there is CAR during the 3-day event window suggests that the market is in a weak form according to the Efficient-market hypothesis.

- elaborate on how this can relate to the efficient market hypothesis

### Conclusion

The results of this study does seem to support the existing body of literature; the interventions do induce positive price shocks in the market. While this is true, the latter part of the study, which is to investigate the determinants that drive the CARs, does not yield significant results. Only one of the three independent variables shows statistical significance after the regression. Although this is the case, some inferences can be made from these seemingly insignificant results. First, we can infer that the market does price in these interventions, as seen with those positive price shocks, but that the market does not care the underlying details regarding the intervention. Second, by seeing this positive price shocks, we can see that our market is in a weak form, according to the efficient-market hypothesis, as semi-strong and strong form are not supposed to have abnormal returns.

This study can be furthered by expanding the dataset while adding more possible determinants of the CARs.

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