Analysis of the Effect of Hedge Fund Activism on Target Firm’s CEO Compensation

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Abstract. Inspired by recent academic advancement as well as real-world cases on hedge fund activism, the main purpose of this paper is to verify the potential effects of hedge fund activism on target firm’s CEO compensation. We used Propensity Score Matching and Difference-in-Differences approach to conduct the statistical analysis based on 835 analyzed samples. We found that the difference between the previous CEO pay level before hedge fund’s intervention and the post CEO pay level after hedge fund’s intervention for target firms is smaller compared to that for non-target firms. The result provides new evidence for the argument that the hedge fund’s intervention can be effective in suppressing the increase in CEO pay in hedge fund’s target firm. The study reveals a possibility that the hedge fund’s involvement in target firm can be viewed as a solution to adjust the executive pay to the reasonable level and make the executive compensation structure more based on company performance.

Keywords: hedge fund activism, Executive compensation, CEO pay, corporate governance, corporate management.

1. Introduction

The intention of this study is inspired by the rapid rise in CEO compensation, the issue of excess CEO pay and the effectiveness of hedge fund’s intervention in recent years in the United States. According to previous literature, Hedge fund activists have successfully intervened their target companies by improving the corporate governance, financial situation, business decisions and so on (Boyson and Mooradian 2011). [1]

Hedge fund activist’s goal is to maximize shareholder value by initiating changes in areas where a target company performs poorly and they propose a variety ways to achieve this end (Cremers, 2016). [2] Hedge fund’s managers always expect to achieve high returns by intervening other target companies since their investment rewards are based on the fund’s annual return (Klein and Zur, 2009). [3] This gives the hedge fund’s managers a good reason to positively influence their target firms. Also, hedge funds can use many different types of financial instruments to successfully attain their goals (Briggs, 2007). [4] For example, hedge funds can achieve certain voting rights, ownership interest, or board seat with their power. Hedge fund sometimes also acquire the firm they target in the case that they fail to achieve their primary goal in it (Cheng et al., 2012). [5]
In developing our argument, we first present some contextual information on hedge fund activism as well as rapidly increased CEO compensation. Next we consider theoretical perspectives on hedge fund activism, focusing on the potential effects on selected firm’s increasing CEO compensation which caused the attention of not just researchers but also many practitioners. Then we discuss our methodology for using Propensity Score Matching and Difference-in-Differences approach in this context. In the following section we present our findings. The final section provides an assessment of our results.

2. Literature review

2.1. Excessive CEO compensation
From the period of middle 1970s to the period of 1990s, the executive compensation has increased rapidly and dramatically. The excess CEO pay has become a serious issue in corporate governance as well as a problem in executive ethics. According to Bolton (2015), it is suggested that the executive compensation and company’s performance need to be aligned with each other. [6] In United States, the issue of excess executive compensation level has caused some debates on the intention of executive compensation setting and the results to be produced. Some scholars argue that the high CEO pay level is the outcome of that the CEO possesses excessive power inside the company and uses the power to set his own pay level. On the other hand, some other scholars argue that the high CEO pay level is the outcome of the fierce competition in the labor market of CEO.

2.2. Background of hedge fund activism
Hedge fund is a type of investment that using collected fund to invest in various assets through some high-risk techniques with the purpose to realize large capital gain from the acquirement (Brav et al. 2008). [7] Hedge fund activists have successfully intervened firm performance from various aspects. For example, Brav et al. (2008, 2009), Cheng et al. (2012, 2015) have documented that most hedge fund activists accomplished their transaction goals though the methods of selling some not profitable assets, obtaining a position on the board, changing CEO, decreasing excess executive compensation and improving shareholder’s benefit by creating higher dividend payout. [7, 8, 5, 9]

The effective intervention by hedge fund activists has been discussed in the previous literature. One of the significant purposes that hedge funds are interested in intervention is that hedge funds can always receive larger benefits compared to the cost they need to pay (Cheng et al., 2012). [5] The reason is that hedge funds are usually not subject to related regulation and they can always accumulate many benefits from any individual company (Brav et al. 2009). [8]

3. Hypothesis development
This paper predicts that the difference between the previous CEO pay level before hedge fund’s intervention and the post CEO pay level after hedge fund’s intervention is expected to be smaller than that in the companies which are not intervened by hedge fund. That is, the main concern of the study is that the hedge fund’s intervention may suppress the increase in CEO pay in target companies. According to Brav et al. (2008), the excess CEO compensation will decline after hedge fund’s intervention. However, some other scholars argue that the CEO pay would not easily be affected by hedge fund’s involvement. [7]

Hypothesis: Hedge fund activism is associated with lower CEO pay after the intervention.

4. Research design

4.1. Sample selection
This research starts sample data collection by acquiring Item 4 of 13D filing from SEC Edgar database during the period from 1995 to 2015. For each one of the 13D filing, this paper collects the hedge fund’s
name, the target company’s name, acquiring date, filing date, filing year and some additional relevant information.

The total sample includes 2,924 hedge funds activism events from the year 1995 to 2015. And among the 2,924 hedge funds activism events, 835 sample data are selected to be relevant to hedge fund activism’s effect on executive compensation. Then through identifying the number and result of the target firms that are acquired at the purpose of adjusting executive compensation, the potential impact on executive compensation caused by hedge fund’s intervention can be analyzed.

4.2. Propensity score matching
One important concern in the hypothesis is that the CEO pay level in target firm would be reduced after the involvement of hedge funds. To address the possibility, the Propensity Score Matching (PSM) method is used to match each target company in the treatment group with a control company in similar industry background, firm size and characteristics.

According to the logistic regression model described in previous articles by Brav et al. (2008) and Cheng et al. (2012, 2015), we developed our own Propensity Score Matching equation below. [7, 8, 5, 9] This model assumes a logistic regression in which the dependent variable is considered as an indicator for whether a target firm has been intervened by hedge fund activists in year t and the independent variables are measured in year t-1.

$$HF_{Activism} = \alpha + \beta_1 \log MV_{t-1} + \beta_2 TobinQ_{t-1} + \beta_3 SALEGROWTH_{t-1} + \beta_4 ROA_{t-1} + \beta_5 DIVIDEND_{t-1} + \beta_6 LEV_{t-1} + \beta_7 R&D_{t-1} + \beta_8 HHI_{t-1} + \beta_9 ANALYSTS_{t-1} + \beta_{10} BHAR(-12,-1) + Year\ Dummies + \epsilon$$

(1)

In this regression equation, the HF Activism represents the sample variable that equals 1 if more than 5% of the shares of target firm has been acquired by hedge fund in the year t. Log MV indicates the log of market capitalization, Tobin Q is the Tobins’s Q, SALEGROWTH represents the sales growth rate in the past years. Moreover, ROA indicates the profitability by dividing a firm’s operating income by its total asset, LEV is the result by dividing a firm’s long-term debt by its total asset, DIVIDEND is dividend rate per share, R&D is research and development expense divided by total asset, HHI is Herfindahl-Hirschman index of sales in different business segments, ANALYSTS represents the number of analysts following, and BHAR(-12, -1) is market adjusted buy-and-hold abnormal return during the (-12, -1) months period relative to the month of hedge fund’s involvement on target firm.

In Table 1, the results of the logistic regression analysis can be observed. Similar to the findings in previous literature by Brav et al. (2008) and Cheng et al. (2012, 2015), hedge fund activists are more probably to intervene companies that have smaller (LogMV), poor market valuation (TobinQ), higher leverage (LEV), lower dividend pay (DIVIDEND), higher R&D expense (R&D), and higher previous stock performance (BHAR(-12, -1)). [7, 5, 9]

| Table 1. Logistic Regression in which the Dependent Variable is an Indicator of Investment by Activist Hedge Funds. |
|-----------------|-----------------|-----------------|
| Dependent Variable: | Predicted Sign | HF=1 |
|-----------------|-----------------|-----------------|
| LogMV_{t-1}    | -               | -0.085***       | 0.011           |
|                 |                 | (-5.34)         | (0.89)          |
| TobinQ_{t-1}   | -               | -0.131***       | -0.147***       |
|                 |                 | (-6.27)         | (-8.70)         |
| SALEGROWTH_{t-1}| -               | -0.000          | -0.000          |
|                 |                 | (-0.83)         | (-0.51)         |
| ROA_{t-1}      | +               | 0.192           | 0.297***        |
### Dependent Variable: HF=1

| Variable       | Estimate 1 | Estimate 2 |
|----------------|------------|------------|
| LEVt-1         | (1.36)     | (3.06)     |
| DIVIDENDt-1    | -0.679***  | -0.810***  |
| R&Dt-1         | 0.829***   | 1.247***   |
| HHi-t-1        | -0.013     | -0.000     |
| ANALYSTSt-1    | -0.005     | 0.000      |
| BHAR (-12, -1) | 0.008***   |            |

**Pseudo R2:**

| N             | 119,677    | 162,690    |
|---------------|------------|------------|
| Year FE       | YES        | YES        |
| Pseudo R2     | 0.059      | 0.054      |

All variables are described in the Appendix. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. T-statistics are reported in parentheses.

Moreover, in the Propensity Score Matching method, the treatment group consists of target companies where hedge fund activists involved. And we match each company in treatment group with a non-target control company that has the most similar propensity score with same background data of industry and year. Also, we examine the co-variate balance between the two groups of samples in order to determine the effectiveness of the Propensity Score Matching process.

### 5. Empirical analysis

#### 5.1. Difference-in-difference

This paper uses the Difference-in-Differences (DID) approach, which is also based on regression analysis, to examine the hypothesis raised at the beginning of the research. The Difference-in-Differences (DID) approach is a statistical method that can compare the executive compensation level changes over time in the treatment group where hedge fund activists involved with the executive compensation level changes over time in the control group where hedge fund activists did not involve. In other word, the Difference-in-Differences (DID) approach simply compare the previous executive compensation level before hedge fund involvement and the post executive compensation level after hedge fund involvement in both treatment group and control group.

\[
\text{TotalComp} = \alpha + \beta_1 \text{HFActivism} + \beta_2 \text{POST} + \beta_3 \text{HFActivism*POST} + \beta_4 \text{CEO}(t, t+2) + \beta_5 \text{LogMV} + \beta_6 \text{ROA} + \beta_7 \text{LEV} + \beta_8 \text{SALEGROWTH} + \beta_9 \text{DIVIDEND} + \beta_10 \text{CashFlow} + \beta_11 \text{CAPEX} + \beta_12 \text{R&D} + \beta_13 \text{MTB} + \text{Year Dummies} + \varepsilon
\] (2)

In the developed equation above, HFActivism is the dummy variable that equals 1 for the hedge fund activism target firms and 0 for the control firms, POST is the dummy variable that equals 1 for the year t+1 and t+2, and 0 for the year t-2 and t-1. The compensation data in year t from the regression model is
excluded in this equation. CEO turnover is measured in year $t$, $t+1$, and $t+2$ and all other control variables are measured at the year $t$.

5.2. Results and discussion

Table 2 shows the results of the Difference-in-Difference Regression model. Columns 1 to Columns 3 represent total executive compensation for both treatment group and control group. Our regression model adopted data TDC2 (total compensation is calculated by the sum of salaries, non-equity incentive plan compensation, bonuses, value realized from stock option exercises, deferred compensation earnings reported as compensation, grant date fair value of stock awards and all other compensation) to conduct the regression analysis.

All variables are described in the Appendix. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. T-statistics are reported in parentheses.

As we can observe from Table 2, the Coefficients on HFActivism ($\beta_1$) indicates that there is no difference in CEO pay level and compensation structure between hedge fund target companies and non-target companies. However, this number is not considered statistically significant in the analysis. Coefficients on POST ($\beta_2$) suggests that generally after hedge fund intervention in target companies and after the corresponding placebo event for control firms, the CEO pay level in both hedge fund target companies and non-target companies increase over the years. Coefficients on POST ($\beta_2$) is considered statistically significant in the analysis.

The main variable of concern in our analysis is the HFActivism*POST ($\beta_3$). The variable HFActivism*POST ($\beta_3$) indicates the difference in CEO pay level before hedge fund intervention and after hedge fund intervention in the treatment group. As we can observe from column 3 that the value for the variable HFActivism*POST ($\beta_3$) is -0.138. The coefficient ($\beta_3$) -0.138 is negative and statistically significant at the 5% level. The test result indicates that the difference between the previous CEO pay level before hedge fund intervention and the post CEO pay level after hedge fund intervention in the treatment group is smaller compared to that number in the control group. That is to say, even though CEO pay level generally increases over time, the hedge fund activism can suppress the increase in CEO pay level.

**Table 2. Difference-in-difference regression analysis.**

| Variables          | (1)     | (2)     | (3)     |
|--------------------|---------|---------|---------|
|                    | TDC2    |         |         |
| **Main**           |         |         |         |
| HFActivism         | -0.048  | 0.143** | 0.354   |
|                    | (-0.77) | (2.51)  | (0.34)  |
| POST               | 0.226***| 0.220***| 0.220***|
|                    | (4.22)  | (4.78)  | (4.81)  |
| HFActivism*POST    | -0.121  | -0.145* | -0.138* |
|                    | (-1.34) | (-1.84) | (-1.77) |
| CEO(T, t+2)        | -0.020  | -0.013  |         |
|                    | (-0.49) | (-0.33) |         |
| LogMV              | 0.374***| 0.363***|         |
|                    | (21.10) | (20.37) |         |
| ROA                | 0.731***| 0.766***|         |
|                    | (3.41)  | (3.56)  |         |
| LEV                | 0.553***| 0.601***|         |
|                    | (5.52)  | (6.00)  |         |
| SALECGROWTH        | 0.006   | 0.006   |         |
|                |        |        |
|----------------|--------|--------|
| DIVIDEND       | -0.056 | -0.070 |
|                | (-1.32)| (-1.64)|
| Cash Flow      | 0.319* | 0.308**|
|                | (2.37) | (2.28) |
| CAPEX          | -0.272 | -0.238 |
|                | (-0.77)| (-0.67)|
| R&D            | -1.232*** | -1.283***|
|                | (-3.26) | (-3.39)|
| MTB            | -0.012* | -0.009 |
|                | (-1.88) | (-1.43)|
| HF Year Fixed Effects | NO | NO | YES |
| N              | 3,336 | 3,189 | 3,189 |
| Adjusted R2    | 0.008 | 0.297 | 0.309 |

### 6. Conclusion
Overall, the result of regression analysis confirms the hypothesis that the hedge fund’s involvement in target firms can reduce the CEO total compensation compared to that in matched control firms. Our analysis implicates that hedge fund activism can help align CEO compensation with shareholder’s benefit and long-term performance of the company. However, the result does not find any evidence to support the hypothesis that the hedge fund’s involvement in target firm could improve CEO compensation structure. Our work also has the potential to advance corporate governance research in several ways. Firstly, at a theoretical level, our findings enabled us to provide new evidence for the argument that the hedge fund’s intervention can be effective in suppressing the increase in CEO pay level in hedge fund’s target company. Secondly, our work opens up new avenues for empirical work to explore the activists hedge fund’s impact on executive compensation. Specifically, the study reveals a possibility that the hedge fund’s involvement in target firm can be viewed as a solution to adjust the executive pay to the reasonable level and make the executive compensation structure more based on company performance.

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