



Socially Active CEOs and their Firm Performance

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Abstract

In this thesis, I examine whether social activism of chief executive officer (CEO) is associated with the firm's operating and marketing performance. I make use of CEO's Twitter account to measure the presence of the account and the intensity of tweets and replies. The main empirical results show that CEO social activism has significantly negative influences on firm operating performance but not on market performance. Further analysis shows that the effect is more pronounced for profitable firms. Socially active CEOs bring negative effects on firm operating performance. However, the number of CEO personal tweets and replies does not enhance the effect on either the firm operating performance or market performance.

Chapter 1. Introduction

Does a firm need a socially active CEO? Would it be beneficial or not when the firm has a socially active CEO? How would shareholders react when the firm has such a CEO? This thesis attempts to answer the questions above by exploring the relation between CEO social activism and firm performance.

It is not that abnormal nowadays to see the famous CEO of multinational companies showing in your daily life. Many CEOs use Twitter, Facebook etc. to communicate with their fans, firm's shareholders, stakeholders, analysts and some consumers dealing with complaints regarding the firm's products or services. Together with them being CEO of a company, their personal characteristics attract followers on Twitter or Facebook. Another situation is that the CEO of the firm likes to be the center of the public eyes. They enjoy themselves to receive more attention than others in social websites. In both ways, social websites play a new role in information disclosure comparing to normal information disclosures methods like financial reports, security supervising departments (SEC in the states) etc. Whether the publicity of CEO has certain influences on firm operating performance motivates me to figure out the association between CEO social activism and firm performance. Twitter, rather than other platforms such as Facebook, is normally organized by the owner himself (herself). Hence it would reflect the CEO's own social activism more accurately and promptly compared to other social platforms like Facebook that run by a certain operator from the firm or fake account totally. Another advantage of using Twitter as a social platform to collect data about CEO social activism is that Twitter verifies the account. Thus, I am able to exclude fake account for the research. In this matter, I seek to acquire confirmation about whether CEO Twitter account and tweets intensity have influences on firm performance.

The separation between ownership and management of a firm could cause agency problems like 'empire building' meaning managing team would invest in non-profitable projects, interests conflict referring the preference differences between shareholders and managers, shareholders and debt holders and so on. To eliminate the side effect brought by this problem, shareholders or investors wish to know more about the executive team than what they could find through brief introduction so that they expect that the firm is in good hand by chosen executive team. Over the past decade, there have been enormous changes in the way information about companies disseminated (Chen, Hwang, and Liu, 2015). Nowadays, shareholders have wider choices to get more information not just what they can find in financial reports especially regarding executives; therefore, shareholders would know more about the

executive who the board of directors appoints. When the firm has its own corporation Twitter account, the CEO might follow the company's movement by starting his/her own Twitter account. The company would use the popularity of CEO on Twitter or Facebook for low-cost or free promotions of their products. However, whether this method could actually work is unknown from former research. This puzzle motivates the writer to find evidence to address the questions above.

The research frame of this thesis takes into two parts: (i) it uses manually collected data regarding CEO Twitter account and tweets intensity to quantify CEO social activism; (ii) this thesis constructs financial indicators for firm performance. This thesis examines whether CEO personal Twitter account is associated with firm performance. Thereafter, to illustrate CEO social activism into depth, this thesis further checks if CEO's tweets intensity, as well as the presence of the account, would impact firm performance. The purpose of this thesis is to reveal the relation between socially active executives and firm performance. To be specific, this thesis attempts to disclose the effects on the firm performance brought by executives' social activism. Having a solid understanding of CEO social power on firm would assist the executive team to better serve the firm e.g. improving firm performance, increasing firm stock price etc.

This thesis contributes to former research in several ways. Firstly, regarding information transferring platform, it is the first thesis examining CEO social activism and firm performance based on the author's knowledge. Former literature exposes results regarding executives' social activism and short-window firm's stock returns but not linked to firm performance. In addition, it is the first thesis to examine whether CEO tweets intensity has influences on firm performance beyond the just presence of CEO Twitter account. This thesis uses CEO tweets and replies filtered that are only related to personal interests. Moreover, this thesis uses CEO social activism as an aspect of CEO characteristics to seek whether socially active CEO as a new personality is advantageous for the firm. It contributes to the growing researches about executive's characteristics and firm performance like gender, education level, dual chairman, age and other characteristics' effects on firm performance.

Empirical results of the thesis show that the presence of CEO's twitter account is negatively associated with operating performance measured by return on assets. However, I fail to find any association between the presence of CEO's twitter account and market performance, measured by cumulative returns. One possible reason why I find the effect of the twitter account on operating performance, but not on market performance is that multi facts in the market influences the stock price. Thus, it is difficult to distinguish the effects on stock

price brought by CEO's social account. Overall, my conclusion is that the social activism of chief executive officer is significant associated with firm performance.

As further analyses, I examine whether the number of the CEO's tweet is associated with operating and market performance, but the results show that there is no association between them. Thus, my conclusion related to this analyses is that CEO's activity on the social account is nothing to do with their firms' performance.

Furthermore, as voluntary information disclosure, this thesis contributes to the research about non-financial voluntary information disclosure and corporate governance. in addition, this thesis contributes to research about executives' characteristics and firm performance indicating by the stock return from an investors perspective.

This thesis is organized as follows. Section 2 reviews about related former literature and findings. Section 3 discusses the main hypothesis of this thesis. Section 4 describes the methodology used in this thesis. Section 5 describes sample selection and basic characteristics of the sampling. Section 6 and Section 7 reports empirical results of the regression analysis together with robustness check. Section 8 concludes.

Chapter 2. Literature Review

In general, this thesis links to former literature in two aspects: (i)As information transmission online platform, executives' social activism firm performance. With the progressively developing technology for information transferring and exchanging, the exposure effect of social media has been expanding hugely. In corporate finance, what certain influences social media could have on firm performance. (ii) Certain executives' characteristics have specific effects on firm performance e.g. executives' overconfidence and social activism. The separation between ownership and control of an entity requires a qualified agency to run the company. For the best interests of shareholders, what executives' characteristics are eligible?

2.1 Social activism, information disclosure, and firm performance

Former researches about social media and firm financial performance find that social media has been playing an essential role in the financial market. Under two assumptions: journalists would comment stylistic differently even for the same content of facts to solve endogeneity problem; randomly selected journalists are not related to the firm in future returns after using unpredictable market index, Dougal, Engelberg, Garc'ia, and Parsons (2012) find

empirical evidence supporting for casual effects between media and market returns by dividing media's effects on stock market performance into unconditional and conditional way and regressing market returns on financial journalists scheduling. Besides the effect on stock returns in financial markets, social media also influences the stock trading volume through affecting investors information receiving procedures. In a different mechanism, Engelberg and Parsons (2011) utilize geographic variation of local paper readership (exogenous shocks to the information in local media coverage for local investors) to analyze media's effects on financial market in trading volume, discovering that the presence or absence of local media coverage is significantly correlated to the probability and magnitude of local trading by regressing local media coverage on trading volume in S&P 500 listed companies.

Luo, Zhang, and Duan (2013) argue that social media can inform investors of the most updated news so that it may be an important indicator in firm valuation. After searching firm equity value and social media information transfer through several media metrics to examine the causality between social media and firm stock performance, they find empirical evidence that social media has mathematical significantly predictive effects on firm equity value by regressing stock returns on web traffic, Internet research and consumer rating etc. Inside the company, from employees to executives, their social activism would also cause certain results to the firm by using blogs and posting personal-related issues on social websites, e.g. quotes and political comments about recent events etc. Customer-generated media like a blog would increase the visibility of firm products without spending millions of money in advertising however the effect would be less strong considering employees may post negative blogs about their firm. Aggarwal, Gopal, Sankaranarayanan, and Singh (2012) take employees' blog as social media metric suggesting that certain employees' blogs are usually positive about their firm and the readership of negative blogs would offset the negative effects brought by these blogs. Therefore, this readership would bring positive effects to the firm as a good strategy because of the growing visibility of firm products.

As chief managers of companies, executives would willingly or not obtain more attention on social websites. Their social activism could be seen as voluntary information disclosure. Summarizing five features of new technology and media's effects on firm disclosure, Miller and Skinner (2015) conclude a complicated interaction between new technology, media and firm disclosure; social media is affecting firm disclosure in several ways, e.g. press playing a monitoring role in a firm but not as legitimation. Using evidence after the regulation change from the 2005 securities offering reform, Shroff, Sun, White, and Zhang (2013) show that firms tend to disclose dramatically more pre-offering information and this increase of pre-offering

disclosures is significantly correlated with reducing information asymmetry, decreasing the cost of equity, and raising firm value after regressing daily bid-ask spread, market depth, analyst forecast accuracy, and abnormal returns on seasoned equity offerings before and after the regulation change (difference in difference test). Regarding the effect of voluntary disclosure on firm performance, regressing Tobin's Q on different risk aspects e.g. stock return volatility etc., Foerster, Sapp, and Shi (2013) reveal that voluntary information disclosure as management earning forecasts is positively associated with firm performance measured through two channels: reduction in (non)diversifiable risk and changes in investors' perceptions about future cash flows.

2.2 Social activism, executive characteristics and firm performance

Due to the great change brought by technology at this stage, firms are using newly developed platforms for the benefit of undergoing and potential business. Blankspoor, Miller, and White (2014) argue that firm could suffer from information asymmetry because the firm's disclosure could only reach a certain portion of investors especially for not highly visible firms, e.g. lower market liquidity firms. By regressing abnormal spread and depth on tweet activities about information events, they find a positive effect on the firm dissemination of firm-initiated. In another way, Drake, Roulstone, and Thornock (2012); Da, Engelberg, and Gao (2011) make use of data from Google search show that investors sometimes would have high information demand that may cause partially preempted earnings announcements. In addition, they find that search volume index (investors search attention using search frequency) has upward effects on the stock price and contributes to large first-day return and long-run underperformance of IPO stocks.

Likewise, even though executives' information is disclosed by the board of directors, it may not reach the majority of shareholders. By the usage of social websites like Twitter, executives could get more closed to shareholders. Shareholders would have more sources about executives' characteristics to determine whether these personalities are qualified for the position and can contribute to firm performance. Through two primary dimensions of CEO: general ability, and communication and interpersonal skills with execution skills, Kaplan, Klebanov, and Sorensen (2012) dig into the positive relation between individual characteristics of CEO candidates and corporate performance in empirical research. After regressing several CEO's characteristics on firm performance in PE transactions, they find that success is more significantly associated with execution, resoluteness, and overconfidence-related skills but not with incumbency. In terms of CEO characteristics and firm performance, Custódio and

Metzger (2013) illustrate evidence from the effect of industry expertise of CEO on acquisition returns to show how CEOs affect and create corporate value. They discover that CEOs create and enhance firm value through merger and acquisition by target selection, negotiation, and integration that are all related to certain CEO general ability; more specifically CEOs having similar working experience in the industry of the target would bring higher abnormal announcement returns than non-experienced CEOs. Similarly, Li, Minnis, Nagar, and Rajan (2014) first analyze the role of communication determined by knowledge level within management team then how the results of such knowledge's effects on communication could influence firm performance. After regressing CEO education level on CEO text, they reveal empirical evidence that CEO with a higher level of knowledge tend to communicate more with management team and that executives who speak more in the job would receive a higher compensation, leading to this knowledge-pay relation of firm value creation. Based on agency theory, executives' compensation is determined by their observable and unobservable contribution to firm performance, Falato, Li, and Milbourn (2015) explain which skills of CEO matter by using data from compensation for credentials that are positively related to firm performance. They argue that CEO compensation's premium is associated with reputational, career and educational components. Especially in large firms, this premium is bigger and more significantly positive to firm performance.

Besides this direct relation between CEO characteristics and firm performance, executives' personalities could also have effects on firm performance through an indirect mechanism like changes in firm features, e.g. executives' characteristics affect firm disclosure policy that is vital for firm value creation. Bamber, Jiang, and Wang (2010) examine what certain influences could top managers' characteristics bring to firm's voluntary corporate disclosures. After examining large sample about managers' observable characteristics and personal backgrounds, they find that top managers can exert an economically significant influence on firm's voluntary disclosure policies by regressing demographic characteristics of managers' personal backgrounds on unique disclosure styles.

Chapter 3. Hypothesis Development

Under agency theory, principals are eager to know whether agencies are able to act to the best of their interests. CEO characteristics contribute to firm performance and CEO success clearly binds to general ability (Kaplan, Klebanov, and Sorensen, 2009). In corporate governance, shareholders would like to know whether CEO has the ability to maximize

shareholders' wealth or to promote the firm's performance to benefit shareholders. Besides the information offered in shareholder meetings, shareholders can make more judicial decisions with more information obtained from executives' Twitter activity. As shareholders can find firm information through financial reports, they can also seize the characteristics of executives by analyzing executives' social activities like tweets and replies. For instance, a CEO continues to post tweets and replies about extreme sports recently after hired by the board of directors. This highly risky sports could be a sign that this CEO is a risk pursuing person so that it may drive out risk-averse investors. The more shareholders know about executives, the more faith they would have in votes. Especially under high level information asymmetry that is not beneficial to firm performance, trust from investors plays a vital role in helping shareholders to percept and utilize the information transferred by the firm (Pevzner, Xie, and Xin, 2015). Therefore, shareholders would expect that executives are in line with the firm's maximal value to maximize their wealth in the future. In other words, by analyzing executives' characteristics through what they do in normal daily life outside the scope of firm management, shareholders would have a better understanding of executives. After certain selections made by the board and shareholders, it is deemed to choose executives who are able to boost firm performance. For example, a well-trusted CEO may attract qualified employees in the future as one of the most important parts of corporate value recently - human capital. More into depth, corporate culture is seen as a big miniature of executives' characteristics. Firm performance would be strong if managers receive trust and ethical approves and this sustainability would also be a corporate value besides observable figures from reports (Guiso, Sapienza, and Zingales, 2015). Under this assumption, this thesis expects to find a positive relation between executives socially activism and firm performance.

In addition, executives' social activity on Twitter would be voluntary information disclosure besides what is required by the shareholders. Followed by Twitter users, executives may unconsciously enhance transparency of firm management as to convince shareholders. Due to the high-level transparency between shareholders and executives, this situation could reduce information asymmetry and produce positive effects on firm performance. In another way, high-level transparency and less information asymmetry may also attract potential investors so that it would provide the firm with sufficient capitalization to run business. Social networks like Twitter, Facebook, and Google can provide statistically highly significant predictive ability in stock market activity (Mao, Counts, and Bollen, 2011; Preis, Moat, and Stanley, 2013; Karabulut 2013). Also, a firm with higher information transparency would bring a better information environment that is positively associated with firm performance.

Likewise, shareholders have the tendency to believe that they can distinguish information quality in executives' social activism to make more accurate decisions. Henceforward, this thesis would expect a positive association between firm performance and executives' social activity.

Furthermore, with the help of news transferring in social websites, executives could issue more rapid announcements under abnormal circumstances. For instance, management team could use the spreading speed to make announcements against personnel scandals. By receiving this information through executives on Twitter, shareholders are more convinced that the firm is still in control even rumors stand out. Unexpected issues especially unapproved bad news for the firm would drive out risk-averse shareholders or potential investors. So, certain communication between executives and shareholders via social websites would relieve the tension and uncertainty. Same as reducing information asymmetry, CEO's social activism may be positively related to firm performance under this argument.

Last but not least, since executives are active on Twitter, there would be millions of followers. Executives social activism could bring more attention to the products of the firm by celebrity effects. As one of the major benefits of celebrity effects like advertising, the company may profit from the increase of products sale. Also, CEO may use social business to boost firm performance, e.g. in the banking industry, senior executives enable themselves to adapt to this new technology for better governance (Kiron, Palmer, Phillips, and Berkman, 2013; Leben, Gardner, and Myers, 2015). For example, executives' activism even purely about personal interests could be an indirect celebrity endorsement to the firm products. With more followers acquainted with the executive, the firm would be more familiar in public and potential consumers would be attracted through this mechanism. Overall, it is beneficial to the firm performance. Accordingly, it would boost the firm's potential business opportunities and enhance firm performance.

However, former study shows that the use of social media among financial market participants has been expanding gradually and releasing significantly negative effects on financial markets (Sprenger, Tumasjan, Sandner, and Welpe, 2014). When executives invest much time on Twitter, shareholders may think that the executive is not focusing on improving firm performance. Chen, Hwang, and Liu (2015) find that a socially active CEO or CFO may bring negative effects on firm stock performance measured by the lower validity of bid-ask spread and shareholders return. Taking an example, executives with showmanship may tend to be active on Twitter causing shareholders' concern about his/her ability to lead the firm. Investors may consider these executives are not devoting themselves to firm performance

enhancement. Therefore, shareholders may lose certain faith in executives. This situation is in the opposite direction of benefits to the firm brought CEO social activism. Furthermore, indirect celebrity endorsement could also bring downward effects to firm performance when the executives intentionally or accidentally post unacceptable tweets or replies on Twitter. In this matter, shareholders would go against the executive and potential investors would drop the investment plan. Also, Miller (2006) shows that media identifies almost one-third of frauds before the announcement of the firm. Moreover, while being familiar with the executive, Twitter users even not shareholders or investors would have the trend to dig into details about executives' social activities in order to get famous on social websites by leaking executives' personal details. Under some situations, it could bring chaos online that is harmful to a stabilized firm. Overall, under such assumptions, this thesis may find a negative relation between executives' social activism and firm performance.

In one word, these theoretical arguments lead to the following hypothesis stated in an alternative form:

H1: Social activism of a chief executive officer is not associated with firm performance.

Chapter 4. Sample Descriptive

After manually searching for CEOs' Twitter account of S&P 500 listed companies, I find 36 of them having a personal Twitter account from certain period 2012 to 2014. Given the data collected, I classify the CEO socially active if he/she has a personal Twitter account. In addition, among the 36 CEOs who have personal Twitter accounts, I further distinguish him/her as more active if he/she also continuously or monthly posted tweets and replies due to his or her personnel interests not just regarding firm operation. To further examine the concept of CEOs' social activism, I also manually count the number of their monthly tweets and replies on Twitter to show the intensity of Twitter activity. As the main interest of this thesis about capturing executives' characteristics through CEO's tweet activity, I divide tweets and replies into firm related and personal two categories. All the Twitter activity data used in this thesis is the later one. Meanwhile, I also find out whether the company has its own corporate Twitter account using as control variable later.

As for firm performance measured by return on assets (ROA), I obtain data regarding firm financial figures from Wharton Research Data Services (WRDS). Based on Ticker Symbol (TIC), I only subtract data suitable for this study from the Compustat and the Center for

Research in Security Price (CRSP) database, leaving 500 firms within the fiscal year from 2012 to 2014 about 12 variables and 26130 observations. However, due to the characteristics of financial sector firms different from other industries and data integrity of financial firms, I filter out firms in the financial sector by excluding Standard Industry Code (SIC) from 6000 to 6999, leaving 13865 observations. Besides ROA, I also make use of cumulative stock returns (CR) to illustrate firm performance. Through CRSP in WRDS, I acquire data linked to firms' stock price change within the fiscal year from 2012 to 2014 to calculate stock returns, around 18244 observations and 9 variables. Based on the thesis interest, I match the sample to S&P 500 companies' financial figures using CIK code from the former database of executives' social activism. Overall, this sample retains two databases to examine the association between executive's social activism and firm value. From the perspective of firm operation, ROA database contains 13865 observations and 12 variables regarding firm performance and 501 observations and 5 variables for executive's social activism. For firm market performance, CR database includes 18244 observations and 9 variables for investor stock returns and the same as ROA database for executive's social activism.

Table I provides the detailed variable definition used in regression models above. It contains three parts from CEO Twitter activism, firm performance, firm and CEO characteristics.

Table I Variable Definition

This table provides definitions of 20 variables in the following regression.

Variable	Definitions
Panel A Firm Performance	
ROA	An indicator, ratio of net income to total Assets, measuring firm performance shows how profitable a company is relative to its total assets.
CR	An indicator shows the difference between share price during holding period to measure investors' stock return.
CAR	An indicator shows the cumulative abnormal return during holding period.
Panel B CEO Twitter Activism	
ACT	A dummy variable: 1 for the CEO has his/her own personal Twitter account, 0 otherwise.

QTL	The quarterly value of CEO's tweets and replies through his/her personal Twitter account from 2012 to 2014.
QTC	The change of current quarterly value of tweets and replies compared to last quarter from 2012 to 2014.
QTCM	The ratio of quarterly value of tweets and replies divided by the mean value of tweets and replies through the research window.

Panel C Control Variables

GENDER	A dummy variable: 1 for the CEO is male, 0 otherwise.
COMP	A dummy variable: 1 for the company has its corporate Twitter account, 0 otherwise.
SIZE	A control variable calculated by the log of total assets to control the company size effects on regression results.
OPTNS	A control variable indicates the opportunity for a company to invest in profitable projects.
LEV	A control variable, the ratio of current assets to current liabilities, represents how a company finances itself through short-term financial instruments.
CAPT	A control variable shows the ratio of a company's total debt to its common equity.
IND	A control variable used as fixed effect in the regression to filter out industry category characteristics effects on the results.
YEAR	A control variable used as fixed effect in the regression to eliminate time effects on the results.
ACC*COMP	A dummy variable: 1 for the company has its corporate Twitter account and the CEO has a personal Twitter account, 0 otherwise.
ACC*SIZE	A control variable calculated by the log of total assets to control the company size effects on regression results when the CEO has a personal Twitter account .
ACC*LEV	A control variable indicates the opportunity for a company to invest in profitable projects when the CEO has personal Twitter account.
ACC*OPTNS	A control variable, the ratio of current assets to current liabilities, represents how a company finances itself through short-term financial instruments when the CEO has personal Twitter account.

ACC*CAPT A control variable shows the ratio of a company's total debt to its common equity when the CEO has a personal Twitter account.

Table II represents the intensity of executives' Twitter activities. Panel A of Table II shows that after filtering out financial sector industry (76 firms), 31 firms' CEO have a personal Twitter account. In panel B, it demonstrates the distribution of quarterly tweets and replies from these 31 executives. The mean value of quarterly tweets and replies posted on executives' personal Twitter account is 20.9728 with the standard deviation 40.8810. The intensity of different executives' Twitter activities is not normally distributed, ranging from the minimum at 0 to the maximum at 319. To further capture the intensity of executives' tweets and replies, it reveals the figure of quarterly tweets and replies changed compared to last quarter. In this setting that captures more about tweets intensity, the standard deviation dramatically goes down to 2.3986 with mean value 0.6352. However, the test may face outlier problem driven by the huge differences between the minimum and the maximum value, 0 and 40 respectively. Hence, last part in panel B of Table II describes the third measurement of tweets intensity - quarterly tweets and replies divided by the mean value of the whole research period. The mean value after this implementation is around 1 (0.9999) with standard deviation 1.9492. Also, the gap between extreme values decreases to 15.2101.

Table II
Sample Description

This table contains descriptive tabulations of social activity on Twitter of 500 CEO from S&P 500 firms from 2012 to 2014.

Panel A: CEO Personal Twitter Account					
<i>Full Sample</i>					
	Non-Financial Sector		Financial Sector		Total
1	31		2		33
0	393		74		467
Total	424		76		500

Panel B: CEO Tweets Intensity					
	Observations	Mean	Std. Dev.	Minimum	Maximum
Quarterly Value	368	20.9728	40.881	0	319

Quarterly Change	367	2.3986	0.6352	0	40
Quarter Value / Mean	367	0.9999	1.9492	0	15.2101

Table III describes the distribution of firm performance from the sample. Panel A presents the firm operating performance measured by ROA. The sample contains 4253 observations for ROA of firms listed in S&P 500 (excluding financial sector) from 2012 to 2014 after merged with the sample collected from WRDS. The average ROA of my sample is 0.0187 with standard deviation 0.0214. Of 4,253 observations from these firms during 12 quarters, 268 quarterly ROA (6%) is negative while 3,992 (94%) is positive. In addition, the minimum and the maximum ROA is -0.2149 and 0.2624 respectively.

Table III
Descriptive Statistics of Firm Performance

This table represents the mean value of firm performance measured by ROA and CR, and standard deviation of the individual firm performance measurement of non-financial sectors firms in S&P 500.

Firm Performance - ROA and CR							
<i>Full Sample</i>							
	Observations	Positive	Negative	Mean	Std. Dev.	Minimum	Maximum
ROA	4253	3992	268	0.0187	0.0214	-0.2149	0.2624
CR	4257	2779	1480	0.0573	0.5189	-0.9885	20.9845

The market performance indicator CR ranges from -0.9885 to 20.9845 and the mean value of 4257 observations for 12 quarters is 0.0573 with standard deviation 0.5189. Among buy-and-hold stock return of these firms for each quarter, nearly 35% (1480) are negative where investors suffered a loss during this period and over 2/3 quarter-firms (2779) during the whole research window show positive stock returns.

Chapter 5. Research Design

The unit of analysis would be a company-quarter due to the firm performance measurement data available in the quarterly database. Twitter, as one of the most important social website, plays an important role in delivering information to shareholders. H1 predicts that there is a significant association between the chief executive officer's social activism and firm performance. I measure executives' social activism first by constructing a dummy variable

(ACT) equals 1 if the CEO has a personal Twitter account, and 0 otherwise. Hence, I implement difference in difference test to study whether firm performance is significantly different between those companies that have a socially active CEO and those do not. Under this setting, I examine whether executive's social activism plays a significant role in influencing firm performance by regressing ROA and CR on executives' social activism. In robustness check, I replace CR by cumulative abnormal return (CAR). In addition, the research also includes the effect from executives' Twitter activity intensity. Specifically, among the more active CEO Twitter accounts, I first assess the influence of quarterly total number of tweets and replies (QTL) to firm performance then test the individual effect of the quarterly number of tweets (QTE) and replies (QRE). Moreover, as showed in the activism database, abnormally distributed figures of Twitter activism may drive the results unexpectedly. Hence, I introduce two more measurements of executive's social activism, the quarterly number of tweets and replies change compared to last examined period (QTC) and the quarterly value of tweets and replies compared to mean value of the examined period (QTCM).

Besides executives' personalities, certain firm characteristics may also push CEOs' Twitter activity e.g. a CEO in the technical industry would be more active on Twitter to follow the modern trend. Therefore, I would add a control variable (IND) in the empirical test by using SIC code to sort the companies in the matched database. In addition, I also impose year control variable (YEAR) since I assume that the CEO's social activism is randomly distributed through three years. Moreover, according to the prior research in firm performance fields, comprehensive variables that should also be taken into consideration are likely to be firm size (SIZE), growth opportunities (OPTNS), capital structure (CAPT) and leverage (LEV). In addition of control variables related to firm performance, I use another control variable linked to corporate's social activism, adding a dummy variable equals 1 if the company has its own Twitter account (COMP), and 0 otherwise.

Overall, the model that will be tested for H1 takes the following form and estimated using OLS regression:

$$\begin{aligned}
 \text{H1: (i) } ROA_{it} = & \alpha + \beta_1 * ACT_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\
 & + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR \\
 & + \beta_8 * COMP + \beta_9 * GENDER + \varepsilon
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii) } CR_{it} = & \alpha + \beta_1 * ACT_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\
 & + \beta_5 * CAPT_{it} + \beta_6 * LEV_i + \beta_7 * YEAR
 \end{aligned}$$

$$+\beta_8 * COMP + \beta_9 * GENDER + \varepsilon$$

$$(iii) \ ROA_{it} = \alpha + \beta_1 * QTL_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\ + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR + \beta_8 * COMP + \varepsilon$$

$$(iv) \ ROA_{it} = \alpha + \beta_1 * QTC_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\ + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR + \beta_8 * COMP + \varepsilon$$

$$(v) \ ROA_{it} = \alpha + \beta_1 * QTCM_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\ + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR + \beta_8 * COMP + \varepsilon$$

$$(vi) \ CR_{it} = \alpha + \beta_1 * QTL_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\ + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR + \beta_8 * COMP + \varepsilon$$

$$(vii) \ CR_{it} = \alpha + \beta_1 * QTC_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\ + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR + \beta_8 * COMP + \varepsilon$$

$$(viii) \ CR_{it} = \alpha + \beta_1 * QTCM_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\ + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR + \beta_8 * COMP + \varepsilon$$

$$(ix) \ CAR_{it} = \alpha + \beta_1 * QTL_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\ + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR + \beta_8 * COMP + \varepsilon$$

$$(x) \ CAR_{it} = \alpha + \beta_1 * QTC_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\ + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR + \beta_8 * COMP + \varepsilon$$

$$(xi) \ CAR_{it} = \alpha + \beta_1 * QTCM_{it} + \beta_2 * IND_{it} + \beta_3 * SIZE_{it} + \beta_4 * OPTNS_{it} \\ + \beta_5 * CAPT_{it} + \beta_6 * LEV_{it} + \beta_7 * YEAR + \beta_8 * COMP + \varepsilon$$

where:

ROA = return on assets measured by net income divided by total assets;

CR = cumulative buy-and-hold stock returns;

CAR = cumulative abnormal stock returns during holding period;

ACT = a dummy variable equals 1 if the CEO of the firm has a personal Twitter account, and 0 otherwise;

GENDER = a dummy variable equals 1 if the CEO is male, and 0 otherwise;

COMP = a dummy variable equals 1 if the firm has corporate Twitter account, and 0 otherwise;

QTL = the total quarterly number of tweets and replies;

QTC = the change of current period tweets and replies compared to last period;

QTCM = the ratio of change of current period tweets and replies to mean number of tweets and replies of the year;

IND = a control variable for industry effect sorted by SIC code;

SIZE = firm size, using natural logarithm of total assets at the end of current quarter;

OPTNS = growth opportunities, ratio of capital expenditure to sales at the end of current year;

CAPT = capital structure, ratio of total debt to common equity;

LEV = leverage, ratio of total current assets to current liabilities;

YEAR = a control variable for time effect.

Chapter 6. Regression Analysis

In controlling for firm characteristics that could drive the results of firm performance measured by ROA and CR, I add certain control variables including firm size, firm financial structure, firm leverage etc. However, some firm characteristics and executives Twitter activity might be endogenously correlated. Table IV shows the Pearson Correlation among observable firm and executives characteristics. As shown in Table IV, the correlation between executives'

Table IV Pearson Correlation Matrix

The table contains correlation among observable variables regarding firm characteristics and executives Twitter activism (*P-value* shown in the parentheses). Variables definitions are in Table I above.

Variable	ACT	GENDER	COMP	SIZE	CAPT	LEV	OPTNS
ACT	1.000						
GENDER	-0.092 (0.000)	1.000					

COMP	0.170 (0.000)	-0.021 (0.167)	1.000				
SIZE	0.098 (0.000)	-0.014 (0.000)	0.092 (0.000)	1.000			
CAPT	0.010 (0.507)	-0.059 (0.000)	-0.023 (0.141)	0.024 (0.123)	1.000		
LEV	-0.017 (0.263)	0.082 (0.000)	0.036 (0.022)	-0.324 (0.000)	-0.027 (0.083)	1.000	
OPTNS	0.000 (0.988)	0.011 (0.486)	-0.002 (0.881)	-0.052 (0.001)	0.003 (0.867)	-0.027 (0.078)	1.000

personal and firm's corporate Twitter account may suggest that when the firm has its own corporate Twitter account, the CEO is more likely to have a personal Twitter account. In addition, the situation also applies to firm size and executives' personal Twitter account. This could suggest that CEOs from big firms might be more likely to have their personal Twitter account compared to those from small firms in S&P 500 (excluding financial sector). Generally, big firms would receive more attention by stakeholders e.g. investors, labor union, consumers, government etc. Hence, CEO of these firms may start their own personal Twitter account to better serve the company. In other words, consistent with hypothesis above, CEO may use Twitter influences to satisfy stakeholders' information requirement and put company corporate strategy into effect. Even though gender is correlated with executives' personal Twitter account, it is hard to predict the association between these two variables due to an insufficient sample of female CEO from S&P 500 (excluding financial sector).

6.1 CEO Twitter Account and Firm Performance

In Table V, it shows the results from the regression analysis of the relation between CEO personal Twitter account and firm operating and and market performance measured by ROA and CR after controlling for firm characteristics, year and industry as fixed effects.

For control variables, the company size and leverage ration both have statistically significant influences on ROA while the absolute value of the coefficient is -0.07% and 0.2% respectively. In addition to the company corporate Twitter account, leverage has statistically significant impacts on firm market performance, increasing CR by 1.6%.

Table V CEO Twitter Account and Firm Performance

The sample contains 424 firms from S&P 500 non-financial sector from 2012 to 2014. The dependent variable is return on assets (ROA) and cumulative return (CR). Variable definitions are in Table I above. In parentheses are t-statistics based on standard errors. ***, ** and * stand

for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively.

Both regressions control for year and industry fixed effect.

	ROA	CR
ACT	-0.0546*** (-4.99)	-0.1312 (-0.42)
GENDER	-0.0029 (-1.09)	-0.0648 (-1.15)
COMP	-0.0008 (-1.09)	-0.0416* (-1.70)
SIZE	-0.0007* (-1.72)	-0.0018 (-0.14)
CAPT	0.0000 (0.30)	0.0001 (0.52)
LEV	0.0022*** (6.91)	0.0168* (1.83)
OPTNS	0.0000 (1.48)	0.0001 (0.56)
ACT*COMP	0.0087** (2.44)	0.1417 (1.39)
ACT*SIZE	0.0039*** (3.68)	0.0103 (0.34)
ACT*LEV	0.0041*** (3.06)	0.0007 (0.52)
ACT*OPTNS	0.0000 (1.27)	-0.0002 (-0.18)
ACT*CAPT	-0.0000 (-1.22)	0.0004 (0.34)
Intercept	0.0240*** (4.93)	0.1517 (1.09)
Year Fixed Effect	YES	YES
Industry Fixed Effect	YES	YES
Number of Obs	4151	4148

As the main interest of this thesis, the regression results suggest that CEOs' personal Twitter account has significant influences on firm operating performance measured by ROA. In agreement with the hypothesis, all as equal, at 99% significant level if the CEO of the company has a personal Twitter account, it would decrease the ROA around 5%. Besides the statistical significance, compared to the 1% ROA mean value of the sample, 5% drop may suggest that CEOs' Twitter activism dramatically decline the profitability of the company's assets. The prediction of this result is when the CEO has a personal Twitter account, CEO may receive more attention from stakeholders in mass media. The influence of CEO Twitter attraction from followers could be in several ways. For example, once something against the firm public image appearing on Twitter, it more severely damages the firm public image because of the popularity and attention of CEO Twitter account. Followers would receive more details about the potential or unverified bad news even obtain fake information that is the worst thing for the company to witness. In terms of the firm market performance indicator, inconsistent with the hypothesis above, the CEO's personal Twitter account has a non-significantly negative impact on CR. Cumulative return is calculated by stock price difference during the research window. Not like ROA based on financial figures that firm have more control with, the stock price is more unpredictable and volatile affected by both firm characteristics and market uncertainty during the research period. Conversely, for corporate's Twitter account, the result reveals that if the firm company has its corporate Twitter account, all as equal at 90% significant level, it will decline the CR by 4%. The company's corporate Twitter account may disclose more information regarding the operation of the company than financial reports, investors would make decisions influenced by this public information especially linked to negative expectation.

Overall, the results above show that socially active CEOs have significantly negative impacts on their firm operating performance measured by ROA. And the possible reason for the effects is that the attraction of CEO Twitter account push followers to expose more details about the firm.

6.2 CEO Twitter Activism and Firm Performance

After examining the effects of CEO Twitter account on firm performance, I look into depth about the association of CEO Twitter activism and firm operating and market

performance. Table VI below represents the results of regression analysis after filtering out those companies whose CEO does not have a personal Twitter account in my sample.

In Column I, against the hypothesis above, it displays that the total value of quarterly tweets and replies (excluding firm related tweets) sent through CEO personal Twitter account has no statistically significant impacts on neither firm operating performance (ROA) nor market performance (CR). It shows that CEO activism is not associated with firm performance. As for control variables, in line with former regression analysis, the company size and leverage ratio both have statistically significant impacts only on firm operating performance, 0.4% and 0.7% respectively.

Table VI CEO Tweet Intensity and Firm Performance

The sample contains 424 firms from S&P 500 non-financial sector from 2012 to 2014. The dependent variable is return on assets (ROA) and cumulative return (CR). Variable definitions are in Table I above. In parentheses are t-statistics based on standard errors. ***, ** and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. All regressions control for year and industry fixed effect.

	(I)		(II)		(III)	
	ROA	CR	ROA	CR	ROA	CR
QTL	-0.0000 (-1.36)	-0.0000 (-0.07)				
QTC			-0.0001 (-0.82)	0.0019 (0.32)		
QTCM					-0.0008 (-1.36)	-0.0016 (-0.07)
GENDER	-0.0052 (0.412)	-0.0790 (-0.35)	-0.0051 (-0.80)	-0.0772 (-0.34)	-0.0052 (-0.82)	-0.0790 (-0.35)
COMP	-0.0042 (-0.65)	-0.0424 (-0.19)	-0.0032 (-0.50)	-0.0455 (-0.20)	-0.0042 (-0.65)	-0.0424 (-0.19)
SIZE	0.0044*** (3.49)	0.0165 (0.37)	0.0041*** (3.26)	0.0181 (0.41)	0.0044*** (3.49)	0.0165 (0.37)
CAPT	-0.0000 (-1.28)	0.0007 (0.46)	-0.0000 (-1.28)	0.0007 (0.45)	-0.0000 (-1.28)	0.0007 (0.46)
LEV	0.0072***	-0.0276	0.0074***	-0.0281	0.0072***	-0.0276

	(4.42)	(-0.47)	(4.49)	(-0.48)	(4.42)	(-0.47)
OPTNS	-0.0037	0.3341	-0.0054	0.3478	-0.0037	0.3341
	(-0.28)	(0.71)	(-0.41)	(0.74)	(-0.28)	(0.71)
Intercept	-0.0275**	0.0145	-0.0261**	-0.0027	-0.0275**	0.0145
	(-2.22)	(0.03)	(-2.10)	(-0.01)	(-2.22)	(0.03)
Year Fixed Effect	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Number of Obs	323	323	322	322	323	323
Adjusted-R ²	0.3561	-0.0573	0.3517	-0.0567	0.3561	-0.0573

From another setting of CEO Twitter activism intensity shown in Column II, it reveals the results from regression the quarterly changed value of tweets and replies on firm performance. Again on the contrary to the hypothesis, the results show that CEO Twitter activism has no statistically significant impacts on firm performance. However, only in this setting of CEO Tweet intensity, it demonstrates that CEO Twitter activism might have positive effects on firm market performance though the result is not significant. In control variables part, it displays the similar results in Column I.

Inconsistent with the hypothesis, in Column III the results from the third setting of CEO Tweet intensity illustrates no statistically significant association between CEO Tweet intensity and firm performance. Whereas, statistical significant effects from the company size and leverage ratio on firm performance still stand as both in Column I and Column II.

Generally, it is hard to examine the association between CEO Twitter activism and firm performance because CEO Twitter activism is extremely non-normally distributed. Therefore, the analysis needs an advanced mechanism to capture the characteristics of CEO Tweet intensity. However, from the three setting used, this thesis does not solve the non-normal distribution problem discussed above. From stakeholders' angle, it might be that shareholders, (potential) investors, labor union etc. put more attention on the literary content of CEO personal tweets and replies instead focus on the number of CEO tweets and replies. Hence, this circumstance could also lead to the results in Table VI.

Chapter 7. Robustness Check

7.1 CEO Twitter Activism and Firm Performance

After the regression analysis above, I also implement robustness check to further support the results shown in previous tables in this thesis. First, as described in Table III above, two firm performance indicators – ROA and CR both have positive and negative figures. I divide the regression into (non-)profitable firm performance in robustness check because CEO Twitter activism might have different impacts on firm performance among profitable and loss-making firms. Table VII illustrates the results after splitting ROA and CR into two parts, (non-)profitable firms and (negative) positive stock returns, all as equal from previous regression setting.

In Column I, the results are from the regression of CEO Twitter account effects on profitable firm performance. For profitable firms, the mean value of ROA increases from 1.8% to 2.1% with standard deviation at 0.017 compared to the whole sample. Consistent with hypothesis above, all as equal at 99% significant level, if the CEO has a personal Twitter account, it decreases ROA by 4.8% among profitable firms. To put it from another angle, for profits-making firms, it damages the profitability to have a socially active CEO. Also, company size and leverage ratio both affect ROA at 99% significant level whereas the marginal effect is not dramatically. And the same result as former analysis, CEOs' personal Twitter account does not significantly affect the firm market performance within positive stock returns firms.

Table VII CEO Twitter Account and (Non-)Profitable Firm Performance

The sample contains 424 firms from S&P 500 non-financial sector from 2012 to 2014. The dependent variable is return on assets (ROA) and cumulative return (CR). Variable definitions are in Table I above. In parentheses are t-statistics based on standard errors. ***, ** and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. All regressions control for year and industry fixed effect.

	(I)		(II)	
	ROA	CR	ROA	CR
ACT	-0.0482*** (-5.83)	-0.5249 (-1.17)	0.2206 (1.50)	0.0283 (0.15)
GENDER	-0.0022 (0.107)	-0.0889 (-1.16)	0.0048 (0.14)	0.0142 (0.39)

COMP	-0.0005 (-0.95)	-0.0436 (-1.30)	-0.0016 (-0.24)	-0.0142 (-1.02)
SIZE	-0.0023*** (-7.03)	-0.0177 (-0.98)	0.0096** (2.45)	0.0149** (1.97)
CAPT	0.0000 (0.82)	0.0001 (0.20)	-0.0005 (-0.76)	-0.0000 (-0.27)
LEV	0.0018*** (7.95)	0.0222* (1.72)	-0.0005 (-0.22)	0.0018 (0.32)
OPTNS	0.0000 (0.30)	0.0005 (1.25)	0.0005* (1.66)	-0.0001 (-0.71)
ACT * COMP	0.0074** (2.48)	0.2214 (1.55)	-0.0360 (-1.07)	0.0290 (0.41)
ACT * SIZE	0.0045*** (5.65)	0.0561 (1.28)	-0.0222 (-1.43)	-0.0130 (-0.70)
ACT * LEV	-0.0001 (-0.18)	-0.1371*** (-2.60)	0.0226 (0.77)	0.0212 (0.80)
ACT * OPTNS	0.0000 (0.69)	0.0004 (0.23)	0.0000 (0.05)	0.0006 (1.10)
ACT * CAPT	-0.0006** (-2.10)	-0.0000 (-0.02)	0.0005 (0.77)	0.0087 (1.44)
Intercept	0.0422*** (11.84)	0.6159*** (3.13)	-0.1228** (-2.28)	-0.4477*** (-5.26)
Year Fixed Effect	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES
Number of Obs	3884	2713	267	1434
Adjusted-R ²	0.4122	0.0126	0.0943	0.2365

However, different from the positive dimension, the results in Column II show that for non-profitable corporations, no statistically significant association is between CEO personal Twitter account and firm performance. The regression analysis outputs suggest a positive effect on firm performance from CEO Twitter account that is different from the former results. Such

phenomenon could arise from not sufficient observations in negative ROA sample. And in the regression results of negative stock returns firms, control variable - company size has statistically significant positive effects on stock return. Overall, the robustness outcomes so far further support the previous results in Chapter 6.

Following the methodology above, I continue to divide the prior regression of CEO Tweet intensity and firm performance into two parts: (i) CEO Tweet intensity and (non-)profitable firms; (ii) CEO Tweet intensity and (negative) positive stock returns. Panel A of Table VIII presents the results of CEO Twitter activism and profitable firms and positive stock returns under three measurements of tweets intensity. In Panel B, it shows the output of the association between CEO Tweet intensity and firm performance in the group of loss-making firms.

Table VIII CEO Tweet Intensity and (Non-)Profitable Firm Performance

The sample contains 424 firms from S&P 500 non-financial sector from 2012 to 2014. The dependent variable is return on assets (ROA) and cumulative return (CR). Variable definitions are in Table I above. In parentheses are t-statistics based on standard errors. ***, ** and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. All regressions control for year and industry fixed effect.

Panel A Profitable Firms and Positive Return						
	(I)		(II)		(III)	
	ROA	CR	ROA	CR	ROA	CR
QTL	-0.0000 (-1.45)	-0.0011 (-0.65)				
QTC			-0.0001 (-1.23)	0.0012 (0.17)		
QTCM					-0.0006 (-1.45)	-0.0219 (-0.65)
GENDER	-0.0093* (-1.86)	-0.0984 (-0.31)	-0.0091* (-1.83)	-0.0781 (-0.25)	-0.0093* (-1.86)	-0.0984 (-0.31)
COMP	0.0148** (2.47)	-0.1609 (-0.48)	0.0156*** (2.58)	-0.1604 (-0.48)	0.0148** (2.47)	-0.1609 (-0.48)
SIZE	0.0022** (1.99)	0.0714 (1.11)	0.0019* (1.75)	0.0721 (1.13)	0.0022** (1.99)	0.0714 (1.11)
CAPT	-0.0012* (-1.45)	0.0000 (0.00)	-0.0012* (-1.45)	0.0000 (0.00)	-0.0012* (-1.45)	0.0000 (0.00)

	(-1.28)	(0.02)	(1.75)	(0.00)	(-1.28)	(0.02)
LEV	0.0002	-0.0777	0.0003	-0.0790	0.0002	-0.0777
	(0.19)	(-0.97)	(0.25)	(-0.99)	(0.19)	(-0.97)
OPTNS	-0.0067	-0.4245	-0.0083	-0.3985	-0.0067	-0.4245
	(-0.64)	(-0.60)	(-0.80)	(-0.56)	(-0.64)	(-0.60)
Intercept	0.0018	0.2173	0.0030	0.1637	0.0018	0.2173
	(-0.17)	(0.34)	(0.28)	(0.26)	(-0.17)	(0.34)
Year Fixed Effect	YES	YES	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Number of Obs	295	206	294	205	295	206
Adjusted-R ²	0.4121	-0.0249	0.4088	-0.0567	0.4121	-0.0249

Panel B Negative Return			
	CR	CR	CR
QTL	0.0003		
	-0.53		
QTC		0.0192	
		(1.08)	
QTCM			0.0063
			(0.53)
GENDER	0.1116	0.1144	0.1116
	(0.79)	(0.82)	(0.79)
COMP	-0.1904	-0.1962	-0.1902
	(-1.48)	(-1.55)	(-1.48)
SIZE	0.0199	0.0240	0.0199
	(0.75)	(0.92)	(0.75)
CAPT	0.0077	0.0075	0.0077
	(0.56)	(0.55)	(0.56)
LEV	0.0817**	0.0833**	0.0817**
	(2.18)	(2.23)	(2.18)
OPTNS	0.3293	0.3518	0.3293
	(1.22)	(1.32)	(1.22)

Intercept	-0.7266*** (-2.84)	-0.7663*** (-3.03)	-0.7266*** (-2.84)
Year Fixed Effect	YES	YES	YES
Industry Fixed Effect	YES	YES	YES
Number of Obs	117	117	117
Adjusted-R ²	0.2929	0.3001	0.2929

In Column I from Panel A for the group of profitable firms, the results indicate that the quarterly value of CEO personal tweets and replies has no significant effects on neither firm operating performance nor market performance same as early analysis. Besides of the control variables like company size and leverage, gender issue and capital structure have statistically significant negative effects on firm performance at 90% level but the marginal effect is less than 0.1%. Moreover, if the company has its own corporate Twitter account, it has significant influences on ROA for profitable firms. If the company has its own corporate Twitter account, it raises the company's assets profitability by 1.48% within profitable companies at 95% significant level all as equal.

For the quarterly change of tweets and replies from profits-making corporations, the results from this measurement of tweets intensity are also statistically insignificant. For control variables, four of them (gender issue, company size, company corporate Twitter account and capital structure) have statistically significant effects on firm performance especially the effect by firm's own corporate account is pronounced.

In Column III, the outputs represent that CEO Tweet intensity still does not significantly influence firm performance. What is interesting in Column III is that all control variables have the same output as in Column I.

Due to small sampling in this thesis for negative ROA, the results are omitted because of collinearity. Panel of B of Table VIII only represents the outcome of CEO Tweet intensity's effects on firm market performance. Different from Panel A, the results for all three measurements of CEO Tweet intensity show positive effects on firm market performance but not significant. In addition of independent variables, all control variables have no statistically significant impacts on firm stock returns except that company leverage ratio has positive effects at 95% significant level. Inconsistent with the hypothesis, the results of robustness analysis for association between CEO tweets intensity and firm market performance are in line with previous regressions' results.

7.2 CEO Twitter Activism and Cumulative Abnormal Return

After dividing the firm performance indicators into two categories, I replace normal holding period stock return with cumulative abnormal stock return (CAR) by calculating the differences between actual stock return and market value equal return (data obtained from CRSP - WRDS). By introducing CAR as a new firm market performance indicator, I seek to find whether CEO social activism is linked to unexpected firm market performance. Investors make decisions based on information gathered from financial statements. Therefore, normally stock price moves accordingly with analyst's prediction. However, driven by unexpected issues and non-financial information that are not reflected in financial statements, investors may receive unexpected returns due to the information disclosed by CEO social activism. For instance, CEO's surprising announcement on Twitter may cause chaos in the firm's stock exchange leading to abnormal trading volume and returns. Table IX displays the results from analysis of the association between CEO Twitter account, activism and firm market performance measured by CAR.

Table IX CEO Twitter activism and Firm Abnormal Stock Return

The sample contains 424 firms from S&P 500 non-financial sector from 2012 to 2014. The dependent variable is cumulative abnormal return (CAR). Variable definitions are in Table I above. In parentheses are t-statistics based on standard errors. ***, ** and * stand for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. All regressions control for year and industry fixed effect.

	CAR	CAR	CAR	CAR
ACT	0.0011 (0.37)			
QTL		0.0000 (0.38)		
QTC			-0.0001 (-0.15)	
QTCM				0.0009 (0.38)
GENDER	-0.0051 (-1.26)	-0.0070 (-0.44)	-0.0064 (-0.40)	-0.0070 (-0.44)

COMP	-0.0000	0.0002	-0.0007	0.0002
	(-0.04)	(0.01)	(-0.05)	(0.01)
SIZE	-0.0024***	-0.0030	-0.0028	-0.0030
	(-2.95)	(-0.86)	(-0.82)	(-0.86)
CAPT	0.0000	-0.0000	-0.0000	-0.0000
	(0.32)	(-0.40)	(-0.40)	(-0.40)
LEV	0.0008	0.0038	0.0037	0.0038
	(1.36)	(0.83)	(0.81)	(0.83)
OPTNS	-0.0000	0.0424	0.0446	0.0424
	(0.18)	(1.16)	(1.23)	(1.16)
Intercept	0.032***	0.0245	0.0236	0.0245
	(3.45)	(0.71)	(0.69)	(0.17)
Year Fixed Effect	YES	YES	YES	YES
Industry Fixed Effect	YES	YES	YES	YES
Number of Obs	12899	1079	1078	1079
Adjusted-R ²	0.0112	0.0006	0.0005	0.0006

Consistent with the hypothesis above, results in Table IX suggest no statistically significant relation between CEO Twitter account and firm market performance or CEO tweets intensity and firm market performance after replacing normal stock returns (CR) with cumulative abnormal returns (CAR). In addition, all control variables except firm size do not significantly affect firm market performance. As explained above, abnormal stock returns could rise from both financial and non-financial aspects, it is hard to catch certain effects on firm market performance brought by CEO Twitter activism (account) because of small sampling and short research period. Furthermore, the treatment of CEO Tweet intensity in this thesis hardly reveals the characteristics of CEO Twitter activism. To find the association between CEO social activism and firm market performance, it requires a more advanced measurement of CEO Tweet intensity. And, it might prove that investors focus more on the content of CEO tweets and only pay attention on useful information for their decisions.

All above, the outputs of robustness check are in consonance with the previous analysis. First, if the CEO has an own personal Twitter account, it significantly damages firm operating performance. After robustness check, it further proves that the effect is more pronounced

among profitable firms. While lacking sufficient sampling, it does not include the effects on unprofitable firms. With regard to stock return (CR) and cumulative abnormal return (CAR), the results support the hypothesis of this thesis. As discussed above, insufficient sampling, multi-dimension influences on stock price, and simple methodology for CEO Tweet intensity could be the reasons of the results in previous tables.

Chapter 8. Conclusion

Based on company financial information and the CEO social activism in S&P 500 (excluding financial sector), this thesis finds results against the hypothesis that the social activism of a chief executive officer is associated with firm performance. To be specific, if the CEO has a personal Twitter account, the ROA will drop by 5.1% at 99% significant level. While for firm market performance, this thesis does not find a statistically significant association between CEO social activism and firm market performance using the same sampling as before.

As for dependent variable, I use return on assets (ROA) for firm operating performance and cumulative stock return (CR) for firm market performance. In robustness check to find further support of the hypothesis, I divide firm performance indicators into two categories namely (un)profitable firms- (negative) positive ROA and (negative) positive stock returns- (negative) positive CR. To quantify CEO social activism, four measurements are used in this thesis from dummy variable to illustrate CEO personal Twitter account, CEO tweets intensity illustrated by the quarterly value of tweets and replies, the quarterly changed value and the ratio of quarterly value to mean value of the year. Moreover, I substitute cumulative stock return with the cumulative abnormal return to study the unexpected effects on firm market performance brought by CEO Twitter activism.

From the initial analysis to robustness check, this thesis obtains statistically significant results supporting the hypothesis. In robustness check, this thesis discovers it more harmful for profitable firms to have a social active CEO but no evidences for loss-making firms. Therefore, for public corporations, shareholders might consider carefully about whether to have a socially active CEO because it may decrease the firm's assets profitability. Having a socially active CEO, the firm would receive more attention on mass media. In this matter, if unbeneficial information or scandal etc. appear in social media, the publicity of CEO Twitter account would accelerate the speed of transferring. Therefore, shareholders might concern about the situation of the firm. But this thesis does not find the certain channel to link CEO social activism and

firm operating performance. And, investors pay more attention to the content of CEO tweets and replies not on the number of CEO tweets and replies.

Even though this thesis proposes a negative association between CEO social activism and firm performance, it does not directly suggest that CEO should not have a personal Twitter account. Shareholders, CEO, and other profits-related parties of the firm need analyze CEO social activism based on the specific situation. As consequences of the short-term research window and insufficient sampling, it is not clear to identify which mechanism the effects by CEO Twitter activism on firm operating performance comes from. Under what situation CEO social activism would affect firm operating performance more? How to use a more advanced level treatment to capture the characteristics of CEO Tweet intensity? What would the results be if expanding the research period to five years? While this thesis has described some evidence of the association between CEO social activism and firm performance, the understanding of the association between socially active CEOs and firm performance still remains limited.

References

- Aggarwal, R., Gopal, R., Sankaranarayanan, R., and Singh, P.V. 2012. Blog, Blogger, and the Firm: Can Negative Employee Posts Lead to Positive Outcomes? *Information Systems Research* 23 (2): 306-322.
- Bamber, L.S., Jiang, J., and Wang, I.Y. 2011. What's My Style? The Influence of Top Managers on Voluntary Corporate Financial Disclosure. *The Accounting Review* 85 (4): 1131-1162.
- Blankspoor, E., Miller, G.S., and White, H.D. 2014. The Role of Dissemination in Market Liquidity: Evidence from Firms' Use of Twitter. *The Accounting Review* 89 (1): 79-112.
- Custódio, C., and Metzger, D. 2013. How do CEOs matter? The effect of industry expertise on acquisition returns. *Review of Financial Studies* 26 (8): 2008-2047.
- Da, Z., Engelberg, J., and Gao, P. In Search of Attention. 2011. *The Journal of Finance* 66 (5): 1461-1499.
- Dougal, C., Engelberg, J., Garcia, D., and Parsons, C.A. 2012. Journalists and the Stock Market. *The Review of Financial Studies* 25 (3): 639-679.
- Drake, M.S., Roulstone, D.T., and Thornock, J.A. 2013. Investor Information Demand: Evidence from Google Searches Around Earnings Announcements. *Journal of Accounting Research* 50 (5): 1001-1040.
- Engelberg, J.E., and Parsons, C.A. 2011. The Casual Impact of Media in Financial Markets. *The Journal of Finance* 66 (1): 67-69.
- Falato, A., Li, D., and Milbourn, T. 2015. Which Skills Matter in the Market for CEOs? Evidence from Pay for CEO Credentials. *Management Science* 61 (12): 2845-2869.
- Feng, L., Minnis, M., Nagar, V., and Rajan, M. 2014. Knowledge, compensation, and firm value: An empirical analysis of firm communication. *Journal of Accounting and Economics* 58: 96-116.
- Foerster, S.R., Sapp, S.G., and Shi, Y. The Effect of Voluntary Disclosure on Firm Risk and Firm Value: Evidence from Management Earnings Forecasts. 2013. Canadian Academic Accounting Association (CAAA) Annual Conference.
- Kaplan, S.N., Klebanov, M.M., and Sorensen, M. 2012. Which CEO Characteristics and Abilities Matter? *The Journal of Finance* 67 (3): 973-1007.

Luo, X., Zhang, J., and Duan, W. 2013. Social Media and Firm Equity Value. *Information System Research* 24 (1): 146-163.

Miller, G.S, and Skinner, D.J. 2015. The Evolving Disclosure Landscape: How Changes in Technology, the Media, and Capital Markets Are Affecting Disclosure. *Journal of Accounting Research* 53 (2): 221-239.

Shroff, N., Sun, A.X., White, H.D, and Zhang, W. 2013. Voluntary Disclosure and Information Asymmetry: Evidence from the 2005 Securities Offering Reform. *Journal of Accounting Research* 51 (5): 1299-1345.