

Nostalgia, Limited Attention and Stock Performance

– Evidence from Hurricane Seasons in China

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Abstract: There is abundant evidence that a company's CEO can have a huge impact on its performance. However, no one has studied how a CEO's childhood experience of disasters affect his decisions now. This paper examines the variation of firm stock performance when CEO's hometown is exposed to hurricanes. Using the CEO profile, firm-month return data and periodic hurricane records in China between 2000 and 2019, we establish a causal link on the effect of CEO hometown disaster and stock underperformance. Further investigation by using DID method shows that this finding is not attributed to firms' physical damage or less risk preference induced by CEO's hometown disaster. The empirical results lend support to the limited attention exhibited by the influenced CEOs.

1. Introduction

Firms' top executives, namely the Chief Executive Officers, are in charge of major business and key affairs of companies. For example, CEOs implements the resolutions of the Board of Directors, and conduct the routine business activities of the company such as entering into external contracts or transact business as authorized by the Board of Directors. As reported by Yim (2013), CEOs are in charge of a large sum of money. It is said that CEOs have supervised over \$7 trillion invalue of mergers and acquisitions since 1992 in the U.S. context. They are playing such an important role in running a firm and it is easy to refer that CEOs take an important part in determining firm's return.

However, one cannot guarantee that every decision made by CEOs is follows a rational cause. A recent stream in the behavioural finance literature has considered the impact of personal characteristics CEOs, on corporate decisions (see Cronqvist, Makhija and Yonker, 2012). For example, Ferris, Jayaraman and Subherwal (2013) found that a number of critical aspects of international merger activity are influenced by the CEO overconfidence. It has been documented that CEOs' behavioural factors also explain the risk preference; companies behave more aggressively under CEOs who experience deadly disasters without extreme negative consequences, and more conservatively under CEOs who witness disasters with extreme negative consequences (Bernile, Bhagwat and Rau, 2017). Moreover, Sunder, Sunder and Zhang(2017) found sensation seeking is a combination of risk-taking and a desire to pursue novel experiences and is associated with creativity. Their evidence suggests that sensation seeking is a valuable personality trait that can be used to identify CEOs who have the potential to drive innovative success.

Apart from abovementioned behavioural factors, limited attention constitutes another important source of irrational that affects CEOs' decision-making process. We start from reviewing different market participants that may exhibit limited attention, which might further bias their performance. In the field of corporate studies, Hirshleifer, Lim and Teoh (2011) found that investors' neglecting profits following profit announcements leads to drift and abnormal profits, and the ignorance of the profit component can lead to abnormal accruals and cash flows; the underlying mechanism, as they argue, is that when costs become salient for investors, not all investors will choose to focus on income or its components in the equilibrium. The limited attention theory is also used to explain the performance of fund managers. Lu, Ray and Teo (2016) find that during the six-month period surrounding and the

two-year period after the marital event, busy managers who manage multiple funds but are not part of the same team are more susceptible to the effects of marriage transitions. As a consequence, inattentive managers are less likely to place bets than managers of the same style, are more burdened by index stocks, and have a higher R-squared associated with systematic factors.

In this paper, I use CEO hometown disaster as a unique setting to test the plausible limited attention exhibited by these top executives. I exploit a difference-in-difference method to investigate how CEOs' hometown hurricane might affect firm stock performance. I show that a hurricane happened in CEO's hometown are accompanied by lower level of firm's stock return. Our evidence suggests that this might be because hurricane of hometown would distract CEOs' attention. In that case, CEOs may not focus on firms' day-to-day operation and investment decisions, and consequently, the firms' stock return might decline. But this decline may not be a permanent issue; it might happen during the hurricane seasons only. In another word, such underperformance is predictable and avoidable.

At the beginning, I explore whether CEOs' limited attention could affect the firms' monthly stock return and how large the magnitude is. I run an OLS regression and the result shows that the stock return decreases by 0.589% if the CEO's hometown province is undergoing a hurricane, as compared to the "safe" provinces and the tranquil period. One may argue that the dip in return performance could simply be a result of firms' exposure to the disaster, I separate the firm into two groups. In the first group, CEOs' hometown is not the same place as the firm's headquarter, and the other is the opposite. I find that former group's CEO's hometown hurricane decreases firm's monthly stock return by 0.658% while the latter group's hurricane only decreases 0.187% of the firm's monthly stock return. This phenomena shows that a hurricane in CEO's hometown could truly affect firm's return, and this different effect on different group shows that hurricanes have less of an impact on companies already in the hurricane zone, it suggest that the role of homesick plays a more significant role, as compared to the real disaster exposure under the hurricane. It also shows that the firm's leverage ratio will increase and the ROA will decrease if the firms' province is undergoing a hurricane. To validate the difference-in-difference design, I also test the pre-trend to see if the firms in control and treated group are statistically indifferent before the event period. The result shows that when there is no hurricane in the CEO's hometown, firms in two groups present no significant difference on the monthly stock return.

One may argue that even if firms headquarter may not be CEOs' hometown, firms may disproportionately allocates their assets in CEOs' hometown since CEOs are typically home biased. This argument may harm our conjecture of limited attention. To alleviate this concern and validate the notion of limited attention, I explore the heterogeneity of physical component of firms. Specifically, I separate the sample into high-PP&E and low PP&E group and test if the hurricane damaged the company physically. The results show that the stock return decreases by 1.159% if the firm has low PP&E level; however, the main effect is diminished for firms with high PP&E level. The results suggest that the emotional channel may dominate the physical one in explaining the baseline findings.

Secondly, I further explore whether companies affected by the hurricane had a high or low risk tolerance. The risk attitude may comprise another confounding factor that explains the underperformance. CEO's hometown disaster may lower the risk preference of the manager, and then, the lower risk preference might be associate with the lower return. To rule out this matter, I examine whether CEOs' hometown hurricane leads to firms' lower indebtedness, where the level of indebtedness is used as a measure of risk preference. It is shown that firms take higher liability, in another word, firms might increase their risk-taking level to keep the profit still when the CEOs' hometown is undergoing a hurricane.

Then, I would like to explore whether the drop in returns after the hurricane hit the CEO's hometown was plausibly caused by inattention. The underlying argument is that when the main results is driven by CEOs' inattention, I would observe a less effect if there are other experts that could effectively take the role of analysing and monitoring the economic decisions made by CEOs. I run another set of regressions and show that the main effect is largely weakened in a subgroup where the number of high-level staffs (economists) is above the average number. In another word, firms with bigger panel size and more economists might suffer less loss on the stock return in the event period, since the availability

to experts might partly cover the loss caused by CEOs' inattention.

This paper contributes to at least two strands of literature. Firstly, this paper contributes to the literature on the role of CEO on firm performance by showing that CEO-level variation can meaningfully affect firms' return. It naturally relates to a string of papers that emphasized the key role CEO plays in a firm(See Yim, 2013; Serfling, 2014; Chen and Zheng, 2014; Duru, Iyengar and Zampelli, 2016). To zoom down the scope, I link this paper to a host of prior studies that discusses how behavioural factors, such as risk preference and overconfidence, affects CEOs' decisions, for example, risk taking, investment and governance etc (Malmendier and Tate, 2005; Cronqvist, Makhija and Yonker, 2012; Ferris, Jayaraman and Sabherwal, 2013; Benmelech and Frydman, 2015; Bernile, Bhagwat and Rau, 2017; Sunder, Sunder and Zhang, 2017) .

Secondly, my work highlights the effect of behavioural factor, specifically, limited attention on firm attributes. I find that CEO's hometown disaster will distract CEO, and then the firm's return declines. This study is related to prior work on various economics outcomes of limited attentions (Hirshleifer and Teoh, 2003; Hirshleifer, Lim and Teoh, 2011; DeHaan, Shevlin, and Jacob, 2015; Lu, Ray and Teo, 2016). Our results suggest that CEO's limited attention should not be ignored as it causes significant loss of firms' value. Importantly, an adequate size of panel and the employment of experts may resolve the possible loss induced by the limited attention of the top executive – this provides a governance implication for the practice.

The rest of paper is organized as follows. In section 2, I introduce and summarize the data; in section 3, I present the empirical results and section 4 concludes the paper.

2. Data and Summary

I obtain data on CEOs, firms' stock performance and attributes, as well as the data of hurricane that happened on China from several sources. Firstly, I collect data on CEOs' profile and firms' information from China Stock Market & Accounting Research (CSMAR). The database contains 1,415 public companies in the mainboard of China and CEOs' personal information such as hometown and tenure, and it also contains firm-level information such as monthly stock return and a variety of financial figures of all firms listed on China main board market. In addition, I collect CEOs' hometown data from the Internet in case the records of CEOs' hometown from CSMAR is not complete. Using the start and end dates of tenure, I construct a panel of CEO service at for each firm between 2000–2019. To exclude interim CEOs and possible errors in misreported start and end dates of CEO tenure, I restrict the sample to CEOs whose total service period exceeds six months. To cleanly attribute home-biased activity to a single individual, I exclude periods of overlapping tenure by multiple CEOs (which often reflect co-CEO arrangements). Moreover, we only include CEOs whose hometown is in the mainland. The resulting data set is at the CEO-firm-year level, without multiple observations possible at the firm-year level due to mid-year CEO turnover. Then, we expand the CEO-firm-year data into a monthly panel that could be merged to firms' monthly stock return. The outcome of these procedures leads to a CEO-firm-month panel that has 115,531 observations.

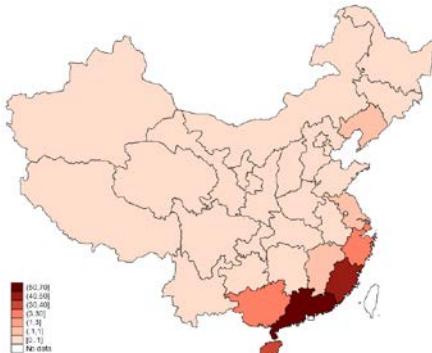


Figure 1. Hurricane Distribution in China (2000-2019)

Another major source of data is the Tropical Cyclone Data Centre, China Meteorological Administration, where I collect the events of hurricane that happened in China in the sample period.

Typically, hurricanes land on the continent between June and October every year, thus, this period of time is named as the hurricane season in our study. The density of hurricane events in mainland of China is plotted in Figure 1. As can be seen in the figure, there are eight provinces that encountered hurricane at least once. Among these provinces, Guangdong, Fujian, Hainan, Guangxi and Zhejiang are more frequently influenced by the hurricane. All these provinces are labelled as the hurricane zone, although the hurricane may not visit the province each year.

Subsequently, I match each hurricane event to the established CEO-firm-month panel using the landing and departing date of the typhoon. Since the major research interest of this paper is to investigate whether CEO is likely to be distracted by the hometown disaster, for each firm-CEO-month observation, I define a binary variable *Treat* that equals to one if CEOs' hometown lies in the hurricane zone. And further, we define another binary variable *Post* that takes the value of one if CEOs' hometown is under the influence of hurricane, and it is noted that for provinces in the non-hurricane zone, we consider *Post* as one during June-October in each year.

Table 1. Summery of data

Panel A

	Observation	Mean	Median	Standard Deviation
<i>Return</i>	115,531	1.222056	0.2788	12.9725
<i>Treat</i>	115,531	0.5518519	1	0.4973063
<i>Post</i>	115,531	0.2301547	0	0.4209335
<i>Log(Asset)</i>	115,531	22.04437	21.7324	1.668918
<i>Log(Debt)</i>	115,531	21.1468	20.88868	1.997578
<i>Debt/Asset</i>	115,531	0.4949329	0.4729521	1.11312
<i>ROA</i>	115,531	0.0359843	0.0356893	0.3378206

Panel B

	<i>Return</i>	<i>Treat</i>	<i>Post</i>	<i>Log(Asset)</i>	<i>Log(Debt)</i>	<i>Debt/Asset</i>	<i>ROA</i>
<i>Return</i>	1.000						
<i>Treat</i>	0.004	1.000					
<i>Post</i>	-0.063	-0.401	1.000				
<i>Log(Asset)</i>	-0.027	-0.044	0.008	1.000			
<i>Log(Debt)</i>	-0.020	-0.051	0.011	0.955	1.000		
<i>Debt/Asset</i>	0.011	0.002	-0.004	0.037	0.132	1.000	
<i>ROA</i>	-0.008	0.003	-0.002	0.012	-0.029	-0.292	1.000

Table 1 reports the summary statistics of the sample. Panel A presents the basic statistical summary including sample size, mean, median and standard deviation. In our main regression analysis in below section, the dependent variable is *Return*, and the major independent variable is the interaction between *Post* and *Treat*. Also, we control for several firm-level attributes including size (*Log (Asset)*), debt (*Log (Debt)*), leverage (*Debt/Asset*) and profitability (*ROA*). Among 115,531 CEO-firm-month observations, 55.19% are in the hurricane zone, and the mean value of *Post* is 23.02%. For target firms, the mean monthly stock return is 1.22% while the median is 0.28%. Panel B displays the pairwise correlations between major variables. It can be seen that that *Treat* is merely correlated with *Return*; however, *Post* is negatively correlated with *Return* by a marginal value of 6.3%. Furthermore, *Return* is slightly correlated with *Log(assets)* and *Log(debt)*.

3. Main result

In this paper, I exploit a difference-in-difference setting to investigate how hurricane might affect firm stock performance. The recurrent and periodic hurricane events in China provide an ideal setting to test this issue, since they are featured by significantly destructive power and a strong seasonal pattern, and they offer a fuzzy division in the geography. Thus, I may find a group of firms that experienced a hurricane before, and I may clearly identify the time of the treatment.

Specifically, I estimate an ordinary least squares (OLS) model that has the following expression:

$$Return_{it} = \beta_0 Treat * Post + \beta_1 Treat + \beta_2 Post + X_{it}\delta + \mu_{it}$$

In this equation, is firms' monthly stock return. $Treat*Post$ is an interaction term between $Treat$ and $Post$, where $Treat$ is a dummy variable that takes the value of one if CEO's hometown is in hurricane zone and $Post$ is another dummy variable that equals to one when the zone is under the influence of hurricane. In this specification, $Treat*Post$ is the variable of major interest, and its coefficient captures the effect of hurricane on firm stock variations. On the top of that, we separately control for $Treat$ and $Post$ to account for the effect of single differences. I interpret as the effect on firm return at the province level, where CEO's hometown provinces are grouped by their history of hurricane. It can be interpreted as the event effect since $Post$ is an indicator of the on-going hurricanes. X_{it} denotes a matrix of control variables at the firm level. All accounting figures of control variables are in the end of prior year.

Table 2. Hurricane, CEO Hometown and Firm Return

VARIABLES	(1) Full	(2) Firm Headquarter ≠ CEO Hometown	(3) Firm Headquarter = CEO Hometown
$Treat*Post$	-0.589*** (-3.323)	-0.658** (-1.994)	-0.187 (-0.078)
$Treat$	0.019 (0.112)	0.023 (0.133)	-0.033 (-0.014)
$Post$	0.173 (1.454)	0.182 (1.498)	0.463 (0.200)
$Log(Asset)_{t-1}$	-1.591*** (-11.144)	-1.667*** (-11.368)	0.064 (0.085)
$Log(Debt)_{t-1}$	0.471*** (4.605)	0.545*** (5.197)	-1.077* (-1.803)
$Debt/Asset_{t-1}$	0.015 (0.486)	0.011 (0.361)	0.913 (0.845)
ROA_{t-1}	-0.022 (-0.178)	-0.007 (-0.052)	-1.172 (-0.725)
<i>Constant</i>	Yes	Yes	Yes
<i>Year-Month FE</i>	Yes	Yes	Yes
<i>Firm FE</i>	Yes	Yes	Yes
<i>Observations</i>	115,531	109,065	6,382
<i>R-squared</i>	0.462	0.462	0.513

Table 2 presents the results of the DID estimation. Column 1 shows that the stock return decreases

by 0.589% if the CEO's hometown province is undergoing a hurricane, as compared to the "safe" provinces and the tranquil period.

One may argue that the decrease in return performance could simply be a result of firms' exposure to the disaster. Therefore, I separate the firm into two groups by headquarter location and test the heterogeneity of the main result. In the first group, CEOs' hometown is not the same place as the firm's headquarter, and the other is the opposite. If CEO's mentality, instead of physical destruction causes the underperformance, the major prediction is the underperformance is only observed in the first group. I find that former group's CEO's hometown hurricane decreases firm's monthly stock return by 0.658% while the latter group's hurricane only decreases 0.187% of the firm's monthly stock return. This phenomena shows that a hurricane in CEO's hometown could truly affect firm's return, and this different effect on different group shows that hurricanes have less of an impact on companies already in the hurricane zone. Collectively, the negative coefficients on CEO hometown's hurricane show that these losses not just materially; in other words, it is more like a psychological blow to the CEO that takes his mind off managing the company's affairs.

Table 3. Hurricane and Firm Return: Pre-trend

VARIABLES	(1)	(2)
	Non Hurricane Period	In Hurricane Period
<i>Treat</i>	0.098 (0.503)	-1.356** (-2.001)
<i>Log(Asset)_{t-1}</i>	-1.557*** (-9.510)	-2.233*** (-5.160)
<i>Log(Debt)_{t-1}</i>	0.542*** (4.658)	0.551 (1.571)
<i>Debt/Asset_{t-1}</i>	0.025 (0.798)	-0.210 (-0.308)
<i>ROA_{t-1}</i>	0.015 (0.119)	-0.510 (-0.938)
<i>Constant</i>	Yes	Yes
<i>Year-Month FE</i>	Yes	Yes
<i>Firm FE</i>	Yes	Yes
<i>Observations</i>	88,001	21,014
<i>R-squared</i>	0.461	0.480

An underlying assumption of this difference-in-difference design is that firms in control and treated group are statistically indifferent before the event period. Therefore, we test this pre-trend assumption by running a regression where the dependent variable is monthly return and the control variable is *Treat*, and the sample period is restricted to either non-hurricane period or hurricane period. Empirically, I run a regression that takes the following specification:

$$Return_{it} = \beta_0 Treat + X_{it}\delta + \mu_{it}$$

where $Return_{it}$ is the firm's monthly stock return. *Treat* is a dummy variable that takes the value of one if CEO's hometown is in hurricane zone. X_{it} is a matrix of control variables for firm characteristics, including $\text{Log}(Asset)_{t-1}$, $\text{Log}(Debt)_{t-1}$, Debt/Asset_{t-1} , ROA_{t-1} .

The results are shown in Table 3. Column 1 shows that when there is no hurricane in the CEO's

hometown, whether the CEO's hometown is in a hurricane zone or not has little effect on the company's monthly profitability. In contrast, in column 2, CEO's hometown hurricane decreases firm's monthly stock return by 135.6%. The negative coefficients on the variables show that hurricanes in the CEO's hometown have a significant impact on the firm's monthly stock return. Overall, the pre-trend of this difference-in-difference is satisfied.

4. Conclusion

In this paper, I examine the stock performance of Chinese listed firms under a unique but important setting of periodic hurricanes in China. Using the CEO profile, firm-month return data and periodic hurricane records in China between 2000 and 2019, I show that the firm experience a dip of monthly return by 0.658% when the CEOs' hometown is undergoing a hurricane. The effect is both statistically significant and economically meaningful. We argue that the main effect is possibly driven by the limited attention of CEOs when CEOs' hometown is exposed to a destructive and long-lasting disaster. Competing stories include the physical damage and reduced risk tolerance. I show that the main effect is not salient for a subsample of high-PP&E firms and firms' indebtedness exhibit no decline following the event period, findings that go against these competing stories. On the contrary, I find that the main effect is diminished in cases where firms have a smaller panel size and fewer economists, and this finding lend support to the limited attention of CEOs. Overall, I highlight the non-negligible role of CEO's limited attention on the performance of firm. Most importantly, an adequate size of panel and the employment of experts may resolve the possible loss induced by the limited attention of the top executive.

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