

Will informativeness make up for the downsides of CEO overconfidence? Evidence from boardroom network centrality

Jun Xu

17 Mar 2021

1. Introduction

In this project, I explore whether a firm's information environment, which is proxied by boardroom network centrality, will modify the downsides of the consequence of overconfident CEOs.

2. Data source

The information about CEOs comes from Execucomp database. I download CEOs' basic information, like name, gender, age, annual compensation, etc. I download the directors' information from Boardex database, which contains the basic information for each director in each company. The companies' financial information and stock price information are obtained from Compustat database and CRSP database respectively. All the data process and analysis are conducted in STATA.

3. Directory organization

I have set the MACRO for the whole codes. If someone wants to run the code in his own computer, he only needs to change the path to his own computer. I created three folders. The first one is for the code, the second one is for the raw data, and the last one is for the intermediate data. For example, I downloaded raw data (public data) and kept them in the "data" folder. When I need them, I directly get them from the "data" folder. After all kinds of processing, I store the intermediate data into the "temp" fold. I also name the intermediate data sets based on their years consistently. Therefore, I can distinguish different data source clearly.

4. Construct the CEO and executives sample

First, I clean the CEO data to make sure that each company-year has one, and only one CEO. Some company-years have no CEO. I identified the highest paid executive as the CEO. Some company-years have more than one CEO. I regarded the highest paid CEO as the true CEO.

4.1 Prepare cik and gvkey identifier

4.2 Clear the CEO data

5. Calculate the network centrality

I create boardroom network centrality measures. Two companies are linked if they share at least one board member. Two companies are not linked if they do not share a board member.

6. Prepare dependent variables

1. EBIT/assets: The firm's EBIT (Compustat: ebit) scaled by its book assets (Compustat: at).
2. CAPEX/assets: The firm's capital expenditures (Compustat: capx) scaled by its assets (Compustat: at).

7. Prepare control variables

7.1 CEO control variables

1. $\ln(\text{CEO tenure})$: The natural log of one plus the number of years that the CEO has been the CEO of the company.
2. $\ln(\text{CEO age})$: The natural log of the CEO's age.
3. CEO bonus/salary: The ratio of the CEO's bonus payment as ratio of his or her fixed salary.

7.2 Corporate control variables

1. MTB: The firm's market-to-book ratio, being its market value at the end of the fiscal year (CRSP/Compustat: $\text{prcc_f} \times \text{csho}$) divided by its book assets (Compustat: at).
2. Cash/assets: The firm's cash holdings (Compustat: ch) divided by its book assets (Compustat: at).
3. R&D/sales: The firm's R&D expenditure (Compustat: xrd) divided by its sales (Compustat: sale).
4. CAPEX/assets: The firm's capital expenditures (Compustat: capx) scaled by its assets (Compustat: at).
5. CAPEX/sales: The firm's capital expenditure (Compustat: capx) divided by its sales (Compustat: sale).
6. $\ln(\text{assets})$: The natural log of the firm's book assets (Compustat: at).
7. Debt/assets: The firm's long-term debt (Compustat: dlts) scaled by its assets (Compustat: at).
8. Intangibles/assets: The firm's intangible assets (Compustat: intan) scaled by its total book assets (Compustat: at).

8. Merge data

After creating all variables, I merge the data to conduct analysis.

9. Data analysis

9.1 Deal with Outliers

I will winsorize the code to deal with the outliers. Specifically, I change the top 1% data to the 1th percentile, and the bottom 1% data to the 100th percentile. Under this way, the influence of outliers is largely eliminated. Stata has the package to deal with outliers, and I can deal with each variable automatically.

9.2 Descriptive statistics

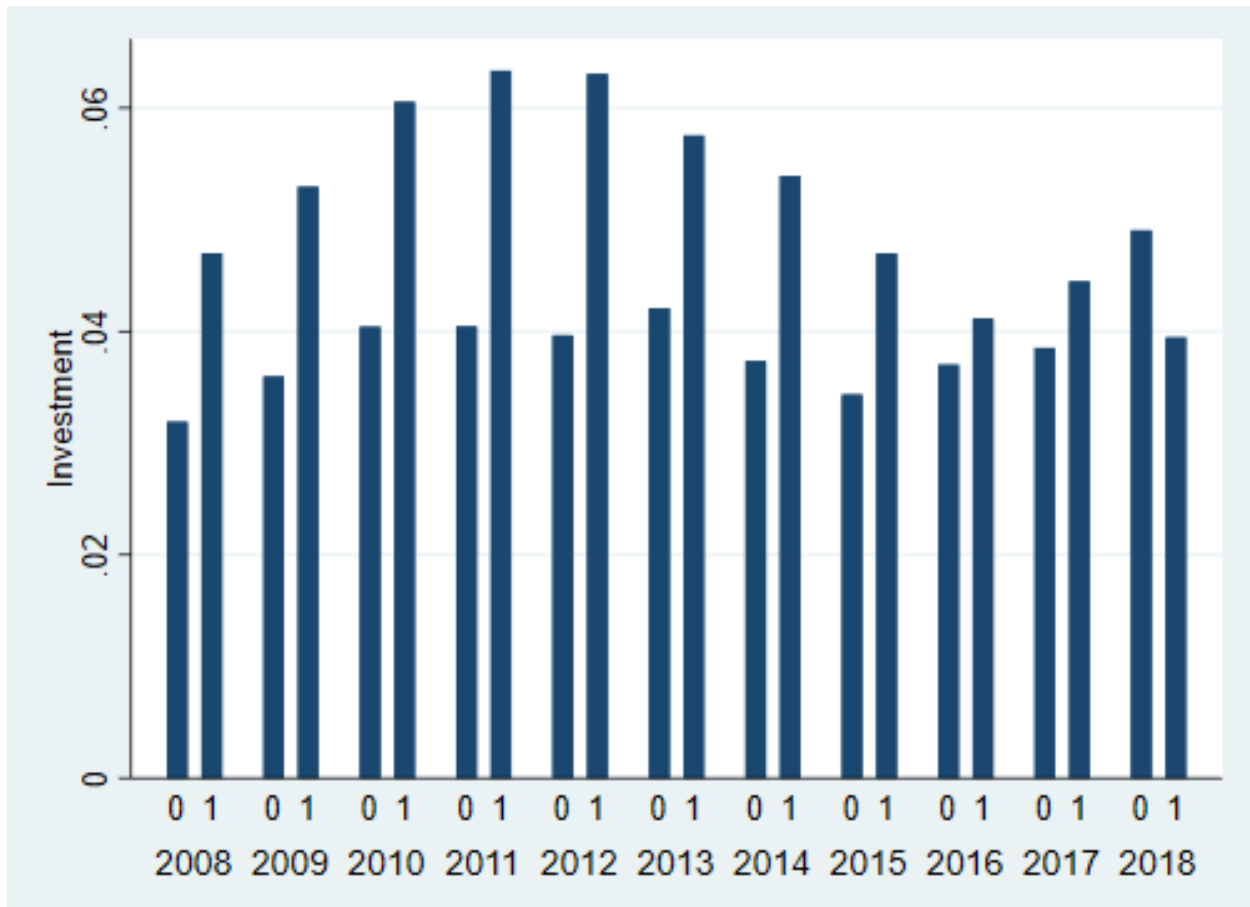
In order to check whether the variables I built contain errors, I created the following descriptive statistics and then compare them to the previous papers.

variable	mean	p25	p50	p75	min	max
Confidence	0.29	0.03	0.24	0.47	0.00	9.68
Overconfidence	0.20	0.00	0.00	0.00	0.00	1.00
Degree	8.48	4.00	7.00	12.00	1.00	65.00
lnCEOtenure	1.73	1.10	1.79	2.40	0.00	4.13
lnCEOage	4.02	3.93	4.03	4.11	3.30	4.56
bonus_salary	2.01	0.00	0.00	0.00	-0.02	5000.00
CEOpower	0.06	0.00	0.00	0.00	0.00	2.00
Cash_Assets	0.11	0.02	0.07	0.16	0.00	1.00
Size	7.68	6.57	7.58	8.74	0.64	13.89
Tobinq	1.90	1.11	1.46	2.13	0.31	123.85
RandD_Sales	0.20	0.00	0.00	0.03	0.00	496.62
CAPEX_Sales	0.08	0.01	0.03	0.06	-0.06	154.82
CAPEX	0.04	0.01	0.03	0.05	-0.03	2.79
LnAssets	7.89	6.65	7.82	9.02	1.35	14.78
Debt_Assets	0.22	0.03	0.18	0.33	0.00	3.85
Intangible~s	0.20	0.02	0.12	0.33	0.00	0.92
ROA	0.03	0.01	0.04	0.08	-3.06	1.40
ChangeROA	-0.00	-0.02	0.00	0.02	-2.87	2.35
CF	0.07	0.03	0.08	0.12	-2.38	1.40
fCAPEX	0.04	0.01	0.03	0.05	-0.03	8.22
fROA	0.03	0.01	0.04	0.08	-3.06	1.40
fChangeROA	0.00	-0.02	0.00	0.02	-2.87	2.35
fTobinq	1.94	1.13	1.49	2.18	0.31	43.99

9.3 Graph

The following graph describes the relation between Overconfidence and investment without controlling for other variables. It shows that Overconfident CEOs indeed overinvest.

```
graph bar (mean) fCAPEX, over(Overconfidence) over(year) ytitle(Investment)
graph export fCAPEX.png, width(500) replace
```



Times series relation between overconfidence and investment

9.4 Check correlations

When I run regression, there could be multicollinearity issues if two variables are highly correlated. Therefore, I check the correlation between each of the two variables first.

	Confidence	Degree	lnCEOtenure	lnCEOage	Tobinq	fCAPEX	fROA
Confidence	1.0000						
Degree	0.0268	1.0000					
lnCEOtenure	0.1095	-0.1212	1.0000				
lnCEOage	-0.0075	0.0009	0.3461	1.0000			
Tobinq	0.3056	0.0398	0.0462	-0.0359	1.0000		
fCAPEX	0.0513	0.0053	-0.0289	-0.0045	0.1970	1.0000	
fROA	0.1515	0.0497	0.0334	0.0183	0.2763	0.0476	1.0000

9.5 Regression results

The end product for statistical analysis is the company-year observations. The following is the regression analysis. There could be other uncontrolled time level or industry level

variables that will also influence the dependent variables. Therefore, I control the time fixed effects and industry fixed effect. I also control for the group level correlations. STATA has convenient way to do so.

Regression results

	(1) fCAPEX	(2) fChange~A
Overconfidence	-0.003* (-1.768)	-0.021*** (-5.396)
Degree	-0.000 (-1.635)	0.001*** (3.163)
CF	0.016** (2.142)	
DegreeexCF	-0.001 (-0.940)	
OCxDegree	0.000** (2.028)	0.001*** (2.724)
OCxCF	0.040** (2.282)	
OCxCFxDegree	-0.003** (-2.045)	
_cons	0.017 (0.945)	0.062** (2.068)
N	13732	13990
r2	0.632	0.203
r2_a	0.630	0.198
F	.	.

t **statistics in** parentheses

* **p**<0.1, ** **p**<0.05, *** **p**<0.01