

REPORT

How quantitative research used to measure the relationship between political connections and business?

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Abstract

This is a report seeking to acquire a deeper understanding on the quantitative research method by analyzing, contrasting the quantitative methods used by two professional essays on a close topic, how political connections affect the business. The purpose of this report is aimed to decompose the process of how the quantitative method is used to measure the relationships on business topic.

Introduction

In this report, contrast on the methodologies and research designs of two quantitative research papers will be carried out. One essay is *Politically Connected CEOs, Firm Performance, and CEO Pay* Published in the *Journal of Business Research* in 2018. The other is *The Effect of Historical Government Affiliations on Resource Acquisition and Organizing Capability: Evidence from Chinese Private Firms*, published in *Journal Of Asia Business* in 2018. We are seeking to analyze the differences between the two essays on the application of quantitative methods and in comparison to their research designs to find a better way to carry out the quantitative research.

Both researchers in charge of the essays carried out the quantitative method professionally and effectively. However, the different research designs and applications could enlighten us on our quantitative research in future.

The following part will introduce the rationale for choosing these two articles, the contrast will follow the steps to construct the quantitative research: to identify a purpose/problems, to pose a question, to review literature, to construct hypotheses, to choose research designs & methods, to test hypotheses and to analyze the outcomes. The recommendations will come in the last part,

The rationale for the choice of the two essays

A series of research papers discussed how important the rent-seeking and protection from the governments are (e.g. Che J, 2002). Hellman, Jones, and Kaufmann (2000) argue that the intervention from the authorities is more severe in institutionally weak countries. Many researchers have proved that political connections have a positive impact on firm performances. Adhikari et al (2006) pointed out that the political connection helps the private firms to more easily acquire resources, including tax treatment, the direction of the policies and the bank loans.

3.1. The research purposes and findings of the two essays

Both essays chosen focus on the political connections of the private firms and seek to quantify the impacts exerted by such connections on Chinese private firms.

The essay *Politically Connected CEOs, Firm Performance, and CEO Pay* (hereinafter called Article 1) was published in the *Journal of Business Research* in

2018, a 3-starred journal according to the Academic Journal Guide 2018. The authors are Huiying Wu in School of Business, Western Sydney University, Sydney, Australia; Sihai Li & Xuan Chen in School of Accounting, Zhongnan University of Economics and Law, Wuhan, China; Sammy Xiaoyan Ying in Newcastle Business School, University of Newcastle, Sydney, Australia.

The essay *The Effect of Historical Government Affiliations on Resource Acquisition and Organizing Capability: Evidence from Chinese Private Firms*(hereinafter called Article 2), was published in *Journal Of Asia Business* in 2018, a 1-starred journal according to the Academic Journal Guide 2018. The authors are Lihua Wang in San Francisco State University, San Francisco, California, USA and Xiaoya Liang in the School of Management, Fudan University, Shanghai, China.

Article1, *Politically Connected CEOs, Firm performance, and CEO Pay*, based on the resource-dependence theory (Maurer and Ebers, 2006), seek to examine the role of executive political connections in affecting CEO pay. Using quantitative methods, it found that political connections of CEO exert a positive impact on the firm performances and CEO pay (Huiying Wu et al, 2018).

Article 2, *The effect of Historical Government Affiliations on Resource Acquisition and Organizing Capability: Evidence from Chinese Private Firms*,based on the relational inertia theory (Hillman, 2005), has its purpose to prove the prior state ownership and a CEO with state career history positively affect the resource acquiring and organizing capabilities of firms. Its findings are the founders' working experience in the state-controlled or state-owned enterprises is not associated with a firm's

information acquisition and organizing capabilities.

3.2. Why to choose the two essays

3.2.1 hypotheses on the grounds of a solid theory

Both essays are researching the same topic of the relationship between political connections and the private firms in China with quantitative research, though they use different theoretical settings.

The resource-dependence theory, the theoretical base of Article 1, place emphasis on the importance of companies building links with the external resources to manage uncertainty(Hillman, 2005). The biggest source of external uncertainty is the government. One way to address the uncertainty is to make politicians be the members of the board(Hillman, 2005). Many studies have proved that political connection can provide a wide range of advantages, like the bank loans((Dinç, 2005), better conditions (De Soto, 1989), tax deduction(De Soto, 1989), increasing a firm's value (Fisman, 2001). In the Chinese context, the resource-dependence theory is also applicable. The private firms in China undertake more institutional restrictions compared with state-owned enterprises. Furthermore, the legislation system of China affords little protection for private enterprises. From the results of a series of studies, it is reasonable to establish the **hypothesis 1**: CEO's political connections have a positive impact on firm performances (Wu et al, 2018).

The relational inertia theory was put forward in article 2, which suggests that even

when the new conditions appear or the situation has changed, actors are inclined to maintain their previous relationship with other actors (Gargiulo and Benassi, 2000).

Most of the literature on relational inertia regard it as a negative factor while the Writer of article 2 believes that the relational inertia could positively impact a firm because the founder could preserve the relationship before to acquire resources for firms. Naturally, **hypothesis 2** was established: a founder's state working history has a positive impact on a firm's resource acquisition (Wang & Liang, 2018).

3.2.2. Similar hypothesis.

Although the two essays were based on two different theoretical settings, they established a similar hypothesis which facilitates the comparison of their methodologies and research designs. Firstly, After checking the definition of the variables, which will be explained in details in next chapter, "CEO's political connection" in article 1 was defined almost the same as "a founder's state working history" in article 2. Secondly, the populations of the two types of research are both private firms in China.

Hypothesis 1 of article 1: CEO's political connections have a positive impact on firm performances.

Hypothesis 2 of article 2: a founder's state working history has a positive impact on a firm's resource acquisition.

Although Both of the articles have established other three hypotheses, they will be omitted in the report for the reasons below: firstly, in the two articles, only 1 of the 4 hypotheses roughly coincides with each other. Methodology and research design could be compared and analyzed more clearly under a similar hypothesis. Secondly, all four hypothesis testings adopted the same procedure, and it is unnecessary to report the testings of all four hypotheses.

3.2.3. To ensure articles coming from different levels of journals

After checking all five essays discussing the relationship between political connections and Chinese private firms from 2018 to date, Article 2 is the only essay from the 1-starred journal ranked by the Academic Journal Guide 2018. Choosing Article 2 to ensure the gap between the applications of the methodologies is beneficial for our incoming analysis and contrast of their methodologies and research designs.

Discussion of methodology and research design

4.1. Introduction

The quantitative approach is about devising and empirically verifying hypotheses on a specific set of data (Frankfort, 1992). Quantitative tools are for hypotheses testing (Merriam, 1988). Both two essays are aimed to prove the hypotheses therefore adopted the quantitative method to construct the research. They followed steps in common to construct their researches: to identify a purpose, to pose a question, to review literature, to construct hypotheses, to choose research designs & methods, to test hypotheses and to analyze the outcomes.

Having analyzed the purposes, literature and constructing hypothesis in chapter 2, the following part will discuss the other steps of the research.

4.2. Method

4.2.1 Data

4.2.1.1. Sampling of Article 2

Samples, population and respondents

As was explained in Article 2, the population of the study is the Chinese privatized firms. the sample is privatized firms in eight cities in the Pearl River Delta region (PRD) and the Yangtze River Delta region (YRD). They created a list of 4,430 target private firms from the 2007 Statistics Yearbook of Private Enterprises and proportionally select target firms in terms of industry, scale and geographic location. The

respondents were ideally the founders or CEOs(sometimes the working staff) of sampled enterprises (Wang & Liang, 2018).

Data collection

This group collected the data by taking the survey by themselves. They mailed over 4000 questionnaires to over 4000 target firms which were listed in the 2007 Statistics Yearbook of Private Enterprises. 254 valid responses were received. Simultaneously their assistants visited the firms to urge the participants to finish the questionnaire and got another 816 responses. There are 1070 valid samples altogether.

Eventually, they made the final decision to use the subsample of 596 in the manufacturing only, though the original sample of 1070 covered 18 industries (Wang & Liang, 2018) because the transformation of small and medium-sized SOEs (state-owned enterprises) and COEs (collective-owned enterprises) occurred primarily in the manufacturing sector (Cao et al, 1999).

4.2.1.2 Sampling of Article 1

Samples, population and respondents

The population of Article 1 is all the private Chinese firms but they adopted a different method to collect data due to the different sampling. The sample included all the private firms listed on the Shenzhen and the Shanghai stock market from 2005 to 2012. Their data resources were the China Market and Accounting research database and CEIC Data's China Premium Database. They manually collected the information

of board from the two authoritative databases and recheck it compared with the information on company websites. After deleting the data of state-owned firms and privatized firms, they got 5925 final samples (Wu et al, 2018).

4.2.1.3 Discussions

All quantitative analysis need reliable data to make logical and reasonable decisions(Waters, D. & Waters, 2008). Researchers are more trustful to the data they think is more representative (Kahneman & Tversky, 1972).

Sample

Many studies proved the importance of large numbers in building representativeness. People intuitively believe that larger samples will provide more reliable results (e.g., Masnick & Morris, 2008; Obrecht, Chapman & Gelman, 2007).

The sampling of Article 1 covered all the listed private enterprises in two widely used database which well represent the population of private enterprises in China. Much previous research was carried out based on the data from the China Market and Accounting research database and CEIC Data's China Premium Database (Conyon & He, 2011; Wang & Xiao, 2011). The authoritative data resource and big data size of 5925 lay a solid foundation of its sampling. Article 1 got a comparatively small sample size of 596 samples. But the sample size is not the only factor deciding representativeness. The sampling procedure is the factor which should be carefully considered when determining how the sampling information should be integrated. The

sample in article 2 only covered the manufacturing firms. The authors explained that there are most privatized companies in the manufacturing sector and only a few privatized firms in other industries, but the sampling will strongly affect the external validity of the research because all responses of all the subsamples should be assessed by their frequency within the general samples. Statistical judgments are influenced by the implied possibility that samples represent the same population.

What is worse, the samples in article 2 included only eight cities in 2 regions, the Pearl River Delta region (PRD) and the Yangtze River Delta region (YRD). The authors have given the reason that PRD and YRD are the most developed regions where 40 percents of private enterprises are, but the factor of uneven regional development of China was ignored. The privatized firms in the 2 regions merely represent the enterprises in the most developed area in China, instead of the population of this essay, all the privatized enterprises in China.

In short, the sampling of article 1 is much better in terms of establishing representation due to the larger sample size, more appropriate sampling method and authoritative data resources.

Collecting data

The researchers of Article 2 collected the data by inviting the founders or CEOs of the privatized firms to finish a questionnaire with a 5-point Likert scale. The dependent variables of the hypothesis, the acquisition of resource, is self-reported by the respondents. A self-report study is a type of survey, questionnaire, or poll in which respondents read the question and select a response by themselves without

interference (Victor Jupp, 2006). It suffers from many weakness because Self-reported answers may be exaggerated (Northrup, 1996).

The self-report study has inherent validity problems. The two measurements in Article 2 were self –reported which lead to high subjectivity of the assessments. Although It is understandable to get the desired data from surveys because there is not an authoritative database including the data of the resource acquisition and organizing capabilities of firms in China, it is regretful the validity and reliability of the questionnaire weren ' t fully guaranteed, which will be explained in details in alternatives below.

Alternative

There are several recommendations to prompt the external validity and reliability of the research (LeCompte & Goetz, 1982).

For article 1&2

One of the methods to prompt the external validity and reliability is to summary the cells of the analysis, according to which the sampled firms should meet some specific criteria (LeCompte & Goetz, 1982). Both of the articles haven ' t set criteria for the targeted enterprises to get the homogeneity of the samples. Homogeneity of the participants plays a critical role in a valid outcome. It is more appropriate to prescribe some characteristics of the sampled firms, like the annual avenue, number of working staff, etc.

For article 2

Johnston *et al* (1988, p.202) suggest that in a business context involving many variables impacting the behaviours and strategies of organizations, individuals in specific positions may see only a part of a whole picture. Therefore it is inappropriate to make a single-informant survey. The respondents of Article 1 were ideally the founders or CEOs of the targeted enterprises. Following Johnston, it is recommended that the respondents of the survey should be swelled to at least 2 managers in key positions, like positions of the directors of marketing and directors of accounting.

To decrease the subjectivity of the self-reported assessments from the administrators, it is advised to encourage the administrators to assess the measurements of other companies in the list. Then researchers could compare the two groups of data, self-reported data and non-self-reported data to increase the validity of it.

Pretesting of the questionnaire is advised to justify the language, format, design and detect the ambiguity and terms in the questionnaire (Churchill 1979). In this way, the questionnaire could be clarified and the instrument could be refined.

4.2.2. Measurement

4.2.2.1. The variables of Article 1

Main variables

Main variables include dependent variables, independent variables and moderating variable. The dependent variable is the firm performance which was defined as the

return of assets (ROA).

Independent variable was political connections. In the previous studies, it had many definitions. In the Chinese context, politically connected CEO have been defined as CEO having worked in central or local government or military (Wang&Qian, 2011). In the Article 1, the definition of political connection was extended to a CEO who previously had a position in Communist Party Committee, the government, the People's Congress, the People's Political Consultative Conference, the People's Court, the People's Procuratorate, the People's Bank, or the military or if he or she currently or previously held membership in the People's Congress or the People's Political Consultative Conference (Wu et al. 2018).

Moderating variable is the regional economic development which was defined as the level of economic development in the places where the firm was, proxied by GDP per capita in 10000RMB(Wu et al. 2018).

Control variables

Control variables comprised two categories, enterprises characteristics and organizational governance structure. Enterprises characteristics were controlled as CEO age, CEO gender, firm size, and debt ratio. The organizational governance structure covered ownership concentration, CEO duality, the proportion of independent directors on the board.

One point should be emphasized that the factors of time and industry effect were taken into considerations. They used industry dummy variables and year dummy variable to control the effect of them.

4.2.2.2. The variables of Article 2

The variables of Article 2 included dependent variables, independent variables, control variables. The dependent variables comprise the acquisition of resources and organizing capabilities. Acquisition resources were measured by 7 items, access to human resources, access to bank loans, access to external investments, access to business information, access to key raw materials and components, enjoyment of government inducements and social network resources (Barney et al. 2001). Organizing capabilities were defined as 7 items too, operational efficiency and cost control 8; R&D and innovation; marketing capabilities (Wang & Liang, 2018)

The independent variable compromised the prior state ownership and founder's state working history. The prior state ownership was defined as initially being founded as SOE(state-owned enterprises) or COE(collective-owned enterprises) and privatized later. State career history means an SOE or COE working experience.

The control variables are the characteristic of firms and founders. the founder's management experience, working history in foreign-invested enterprises (FIEs), the founder's age and the founder's education were taken into the regression models, as well as the size of the enterprises, age of the enterprises, the growth stage of the enterprises, whether it was a start-up company, whether it was in the PRD and industry.

The impact of the industry was also controlled by including six industry dummies.

4.2.2.3. Discussion

The research instruments of both essays were integrated for the well-formed variables and all the variables were logically based on the previous study.

For Article 1, the main variables were integrated with control variables and the effects of industry and time were controlled. The only suggestion is the measurement of firm performance. In Article 1, firm performance was defined as ROA (return of assets). Only one measurement can't define the firm performance well and the Tobin's Q is suggested to be included as another measurement. Q ratio is defined as the market value of the assets deflated by the book value of assets (Nicholas C, 1966), which is the estimation of a specific business whether it is overvalued or undervalued. Combined with ROA and Q ratio, the firm performance could be overall assessed and lead to more solid research.

For Article 2, it also took the impact of industry into the consideration and set the industry dummies. However, compared with Article 1, it hasn't controlled the time effect while in article 1, both industry and time effect was considered by setting industry and year dummies.

the emphasis also should be laid to the validity and reliability analysis in Article 2. Because it used the self-reported questionnaire, the validity and reliability analysis had to be undertaken. the Cronbach's alpha was used to check the reliability of each

items in the questionnaire and all are above 0.8, which means the questionnaire is reliable. Factor analysis is a method aimed to analyze interrelationships (Reyment & Joreskog, 1993) Factor analysis enables the reduction of the number of variables into a smaller set of factors. Confirmatory factor analysis is essential in this study. Figure 1 below is the listed measurement items and the reliable test outcome.

Table II Factor analysis results of resource acquisition and organizing capabilities		
Item	Factor 1	Factor 2
1. Access to human resources		0.621
2. Access to bank loans		0.854
3. Access to external investment		0.815
4. Access to important business information		0.685
5. Access to key raw material or components		0.601
6. Enjoyment of government inducement		0.762
7. Utilization of social network		0.559
8. Operational efficiency	0.793	
9. Cost control	0.797	
10. R&D and innovation	0.645	
11. Market exploration	0.788	
12. Response to market/customer needs change	0.794	
13. Maintenance of customer relationship	0.706	
14. Brand identity development	0.544	
Eigenvalue	5.545	2.429
Percentage of variance explained	0.40	0.17
Alpha coefficient	0.87	0.85

Figure 1 the Factor Analysis Results of Article 2 图表 1

4.3. Results analysis

4.3.1. The descriptive analysis

Descriptive statistics and correlations.

	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11
1 CEO pay	12.66	0.962	9.21	14.9	1										
2 Existence of political connections	0.412	0.492	0	1	0.102***	1									
3 Regional economic development	5.667	2.932	0.417	17.51	0.312***	-0.003	1								
4 Age	49.72	7.801	26	85	0.145***	0.144***	0.091***	1							
5 Gender	0.054	0.226	0	1	-0.005	0.002	0.036***	-0.018**	1						
6 Firm size	21.08	1.031	18.63	25.3	0.351***	0.179***	0.140***	0.217***	-0.035***	1					
7 Leverage	0.456	0.349	0.046	2.19	-0.139***	-0.008	-0.120***	-0.068***	0.008	0.048***	1				
8 ROA	0.043	0.08	-0.38	0.231	0.249***	0.058***	0.124***	0.085***	0.024***	0.138***	-0.441***	1			
9 Ownership concentration	33.59	14.48	8.99	75.9	-0.011	0.043***	0.005	0.064***	0.003	0.261***	-0.075***	0.124***	1		
10 CEO duality	0.305	0.461	0	1	0.105***	-0.031***	0.119***	-0.108***	0.018**	-0.157***	-0.095***	0.033***	-0.063***	1	
11 Independent directors ratio	0.368	0.051	0.25	0.556	0.062***	-0.01	0.112***	-0.016*	0.001	0.033***	0.001	0.017**	0.017**	0.081***	1

Figure 2 the Descriptive Statistics of Article 1 图表 2

Table III Descriptive statistics and correlation matrix of main variables																	
Major variables	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Founder's age	44.33	8.95	22	85	1												
2. Founder's education	2.98	1.31	1	6	-0.13*	1											
3. Founder's Mgt. Exp.	13.52	7.45	0	40	0.62*	-0.01	1										
4. Founder's FIE Exp.	0.09	0.29	0	1	-0.12*	0.12*	-0.11*	1									
5. Firm size	3.26	1.88	1	8	0.22*	0.24*	0.37*	-0.10*	1								
6. PRD region	0.61	0.49	0	1	0.23*	-0.11*	0.13*	-0.24*	0.12*	1							
7. Firm age	9.54	6.98	1	52	0.45*	-0.04	0.60*	-0.13*	0.40*	0.05	1						
8. Founding stage	0.22	0.42	0	1	-0.04	0.003	-0.02	-0.02	-0.08	-0.02	-0.08	1					
9. Decline stage	0.05	0.22	0	1	-0.04	-0.03	-0.10*	0.07	-0.05	-0.04	-0.09	-0.12*	1				
10. Start-up	0.11	0.32	0	1	-0.06	-0.02	-0.10*	0.01	-0.18*	-0.10*	-0.08	0.14*	-0.08	1			
11. Prior state ownership	0.22	0.41	0	1	0.17*	0.11*	0.21*	0.001	0.30*	0.09	0.20*	0.02	-0.00	-0.19*	1		
12. Founder's state career history	0.49	0.5	0	1	0.23*	0.12*	0.22*	-0.32*	0.16*	0.19*	0.30*	-0.02	-0.15*	-0.02	0.05	1	
13. Resource acquisition	3.03	0.79	1	5	0.06	0.01	0.04	-0.03	0.07	0.07	0.06	-0.17*	-0.20*	0.07	0.11*	0.10	1
14. Organizing capabilities	3.09	0.78	1	5	0.11*	0.02	0.11*	-0.07	0.05	0.02	0.06	-0.14*	-0.18*	-0.02	0.07	0.11*	0.52*

Notes: *p < 0.05 (all p-values use two-tailed test). Dummy variables for industries are not included

Notes: * $p < 0.05$ (all p -values use two-tailed test). Dummy variables for industries are not included

Figure 3 the Descriptive Statistics of Article 2 图表 3

We could see the descriptive statistics and correlation matrix of the main variables of both research from the tables above. Both of the essays pointed out that the descriptive statistics not only show the descriptive figures of the measurement items, but also ruled out the possibility of multi-collinearity. The correlation matrix shows that

the correlation is lower than 0.6, which ruled out the possibility of multi-collinearity.

The authors of Article 2 checked VIF value, which is also a method to rule out multi-collinearity, when it is lower than 2 (Hair et al, 1998).

4.3.2. The regression analysis

Political connections and firm performance.

Independent variable	Model (1)	Model (2)
	ROA	ROA
Existence of political connections	0.008*** (3.96)	
Local political connections		0.004* (1.90)
Age	-0.000 (-0.05)	0.000 (0.34)
Gender	0.012*** (3.04)	0.012*** (3.13)
Firm size	0.005*** (5.71)	0.006*** (6.38)
Leverage	-0.093*** (-33.60)	-0.093*** (-33.56)
Ownership concentration	0.001*** (8.48)	0.001*** (8.46)
CEO duality	-0.001 (-0.68)	-0.001 (-0.64)
Independent director ratio	-0.008 (-0.43)	-0.008 (-0.46)
_cons	-0.102*** (-4.57)	-0.113*** (-5.09)
Year	Yes	Yes
Industry	Yes	Yes
F	56.973	56.513
R	0.253	0.251
Observations	5935	5935

* Indicates statistical significance at the 10% level.

*** Indicates statistical significance at the 1% level.

Figure4 Regression Analysis of Article 1 图表 4

Table IV	Effects of prior state ownership and a founder's state career history on resource acquisition^a			
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<i>Control variables</i>				
Founder's age	−0.02 (0.01)	−0.04 (0.01)	−0.01 (0.01)	−0.04 (0.01)
Founder's education	0.03 (0.04)	0.01 (0.04)	−0.03 (0.04)	0.00 (0.04)
Founder's management experience	0.05 (0.01)	0.05 (0.01)	0.03 (0.01)	0.05 (0.01)
Founder's FIE experience	−0.02 (0.16)	−0.03 (0.16)	−0.03 (0.16)	−0.02 (0.17)
Firm size	−0.03 (0.03)	−0.07 (0.03)	−0.00 (0.03)	−0.06 (0.03)
PRD region	0.05 (0.09)	0.05 (0.09)	0.02 (0.09)	0.05 (0.09)
Firm age	0.03 (0.01)	0.02 (0.01)	0.04 (0.21)	0.00 (0.01)
Founding stage	−0.18** (0.11)	−0.19** (0.11)	−0.13* (0.11)	−0.19** (0.11)
Decline stage	−0.23*** (0.22)	−0.23*** (0.22)	−0.24*** (0.23)	−0.22*** (0.22)
Start-up	0.12* (0.14)	0.15** (0.14)	0.07 (0.13)	0.16** (0.14)
Industry	Included	Included	Included	Included
<i>Independent variables</i>				
Prior state ownership		0.19** (0.11)		0.19** (0.11)
Founder's state career history			0.06 (0.10)	0.04 (0.10)
<i>R</i> ²	0.13	0.16	0.12	0.17
<i>F</i>	3.03***	3.61***	2.7***	3.43***
<i>N</i>	327	327	327	327
Notes: ^a Standardized errors are in parentheses; † <i>p</i> < 0.10; * <i>p</i> < 0.05; ** <i>p</i> < 0.01				

Figure 5 Regression Analysis of Article 2 图表 5

Both of the essays carried out the regression analysis to test the hypothesis. In Article 1, hypothesis 1 claimed that political connections positively related to firm performance. Table 4 showed the coefficient of political connections is positively significant ($p < 0.01$), which is consistent with the prediction that political connectedness has a positive effect on firm performance. In article 2, hypothesis 2 claimed that there was a positive relationship between the founders' state career history and the acquisition resource of organizations. From the model3 in table 5, we concluded that the coefficient of a founders' state career history is insignificant. Hypothesis 2 was not supported.

4.3.3. Robustness test

Luke Keele (2008) has said, "Statistical models are always simplifications, and even the most complicated model will be a pale imitation of reality." Robustness testing analyzes the uncertainty of models and tests whether estimated effects of interest are sensitive to changes in model specifications. The researchers of Article 1 have undertaken elaborate robustness tests.

Firstly, they replace the previous measurement of ROA with adjusted-ROA to run the regression analysis again. Table 6 shows that the political connections were still positively related to firm performances ($p < 0.01$).

Secondly, they use random-effect models to further test the robustness of the findings, table 7 reported that the results keep the same with previous results. They also use firm fixed-effects models to control concerns relating to omitted variable bias. As is shown in table 7, the outcome was quantitatively the same.

The robustness test could increase the validity of the inferences. However, the research design of Article 2 didn't compromise the robustness test, which makes the research design less integrated.

Robustness test based on industry-adjusted ROA and abnormal returns.

Independent variable	Model (1)	Model (2)	Model (3)	Model (4)
	Industry-adjusted ROA	Industry-adjusted ROA	Abnormal returns	Abnormal returns
Existence of political connections	0.008*** (4.04)	0.015*** (3.69)	0.028* (1.80)	0.075** (2.26)
Existence of political connections × regional economic development		-0.001** (-1.98)		-0.009* (-1.72)
Regional economic development		0.001** (2.57)		-0.001 (-0.15)
Age	-0.000 (-0.01)	0.000 (0.10)	-0.002* (-1.77)	-0.002* (-1.94)
Gender	0.012*** (2.94)	0.011*** (2.80)	0.020 (0.62)	0.025 (0.73)
Firm size	0.006*** (5.92)	0.005*** (5.57)	0.025*** (3.11)	0.027*** (3.26)
Leverage	-0.092*** (-33.42)	-0.091*** (-32.85)	0.023 (0.89)	0.028 (1.03)
Ownership concentration	0.001*** (8.60)	0.001*** (8.45)	-0.000 (-0.21)	-0.000 (-0.17)
CEO duality	-0.002 (-0.74)	-0.002 (-0.96)	-0.012 (-0.68)	-0.014 (-0.78)
Independent director ratio	-0.007 (-0.38)	-0.010 (-0.56)	0.091 (0.61)	0.099 (0.66)
_cons	-0.092*** (-4.14)	-0.093*** (-4.08)	-0.701*** (-3.76)	-0.748*** (-3.92)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
F	47.063	43.742	7.999	7.810
R	0.218	0.219	0.060	0.063
Observations	5935	5804	4436	4331

* Indicates statistical significance at the 10% level.

** Indicates statistical significance at the 5% level.

*** Indicates statistical significance at the 1% level.

Figure 6 Robustness Test of Article 1(adjusted ROA)图表 6

Robustness test based on random- and fixed-effects models.

Independent variable	Random-effects model		Fixed-effects model	
	Model (1)	Model (2)	Model (3)	Model (4)
	ROA	CEO pay	ROA	CEO pay
Existence of political connections	0.008*** (3.71)	0.103*** (3.56)	0.009** (2.01)	0.136*** (3.52)
Age	-0.000 (-0.27)	0.004** (2.05)	-0.000* (-1.88)	0.002 (0.77)
Gender	0.012*** (2.85)	-0.184*** (-3.12)	0.018** (2.09)	-0.298*** (-3.93)
Firm size	0.004*** (3.65)	0.283*** (17.94)	-0.022*** (-9.03)	0.257*** (11.72)
Leverage	-0.094*** (-31.38)	-0.046 (-1.05)	-0.107*** (-17.94)	0.087 (1.56)
ROA		1.046*** (8.00)		0.839*** (6.10)
Ownership concentration	0.001*** (8.23)	-0.001 (-1.03)	0.001*** (8.04)	-0.002 (-1.00)
CEO duality	-0.002 (-0.98)	0.153*** (6.18)	-0.004 (-1.04)	0.124*** (4.31)
Independent director ratio	-0.004 (-0.20)	0.277 (1.24)	0.037 (1.22)	0.245 (0.96)
_cons	0.000 (0.00)	5.899*** (16.21)	0.488*** (8.32)	6.622*** (12.82)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
R				
Within	0.1158	0.2421	0.1456	0.2505
Between	0.4124	0.2552	0.2256	0.1395
Overall	0.2521	0.2358	0.1511	0.1508
Observations	5935	5036	5935	5036

* Indicates statistical significance at the 10% level.

** Indicates statistical significance at the 5% level.

*** Indicates statistical significance at the 1% level.

Figure 7 Robustness Test of Article 1(random-and-fixed -effects models)图表 7

5.Conclusion and recommendations

In the comparison of the methodologies used in the two essays, we found that the application of quantitative research is different even on a very close topic with the same methods. From the report, it is found that the application of article 1 outperformed Article 2 in terms of the sampling, determining the variables, the

integration of the research design.

There are several recommendations after comparing the two essays. Firstly, A large sample size, reliable data resources and appropriate sampling procedure can help get more reliable data. Secondly, the researchers should be prudent to take a large scale survey, seeking to ensure both the external and the internal validities . The pretest is also recommended before the formal survey to justify the questionnaire; the homogeneity of the samples should be considered; in a business context involving complicated factors affecting the strategies of the organizations, a single informant survey is not suggested. Thirdly, having determined all the variables, it is advised to do the factor analysis and uses the Cronbach's Alpha to ensure the validity and reliability of the variables. Fourthly, controlling variables should take a lot of external effect into consideration. Time effect and industry effect, in this report, should both be considered. The loss of one controlling variable will lead to the inaccuracy of the outcome. Last but not the least, the robustness test is strongly recommended to increase the validity of the inferences.

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Appendices:

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Article1:

<https://www.sciencedirect.com/science/article/abs/pii/S014829631830290X?via%3Dihub>