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Research Article

An Empirical Analysis of the Restriction Effect of Corporate Governance on Over-investment in Food Industry

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Abstract: This study aims to investigate the restriction effect of corporate governance on over-investment in food industry. Market value of a firm can be damaged by over-investment activities. Much effort has been made on the control of enterprises' over-investment based on ownership structure; however, limited work has been done to address the restriction effect of corporate governance on over-investment. Using the data from 2002 to 2009 of Chinese non-financial listed companies as samples, this study empirically studied the restriction effect of corporate governance on over-investment which was measured based on the Richardson model. The results show that, firstly, there is a significant negative relation between ownership concentration and over-investment, that is, concentrated ownership can restrict the over-investment. Secondly, the splitting of the positions of Chef Executive Officer (CEO) and Chairman also can help to restrict overinvestment of listed companies. Thirdly, there is a significant negative correlation between managerial stock ownership and over-investment; in other words, the over-investment in the company with higher proportion of managerial owned shares is significantly higher than that of a company with lower proportion of managerial owned shares. However, non-state-owned dependent director and board of supervisors cannot restrict the over-investment of listed companies effectively. Further evidence shows that industry competition and market process can influence the restriction effect of corporate governance on over-investment. According to the above results, this paper puts forward some policy suggestions on how to restrict over-investment of listed companies from the perspective of corporate governance.

Keywords: Corporate governance, food industry, over investment, restriction effect

INTRODUCTION

As one of the three core issues of financial theory, corporate investment decisions have attracted a lot of attention. Corporate investment is the main motivation of the firm growth and the source of the increase of future free cash flow. In the perfect world of (Modigliani and Miller, 1958), the main goal of corporate investments is maximizing the firm value and the decision of corporate investment only depends on the net value of the project and not affected by other factors. However, because of the imperfect capital market in the real world, the company's investment activities often deviate from the goal of maximizing firm value. Corporate managers always make over-investment behavior though investing in the negative net value of the project, hence, damage the market value of the firm (Jensen, 1986; Yang *et al*., 2010). The phenomenon of over-investment in Chinese enterprises is especially serious and the investment in fixed assets in 2011 was close to half of the Gross Domestic Product (GDP) (Yang *et al*., 2010). As a result, the over-investment leads to the supply exceeding the market demand and resulting in the waste of social resource and lower company efficiency (Li and Li, 2011; Richardson, 2006; Yang and Hu, 2007).

Jensen (1986) and Lang and Litzenberger (1989) first introduced the problem of over-investment based on the asymmetric information between shareholders and managers and defined over-investment behaviour as managers invest free cash flow in projects with negative Net Present Value (NPV). Then the agency theory (Grossman and Hart, 1980; Jensen, 1976; Stulz, 1990), the asymmetric information theory (Myers and Mailuf, 1984; Narayanan, 1988) and the behaviour finance theory (Blanchard *et al*., 1994; Heaton, 2002; Malmendier and Tate, 2005; Roll, 1986) have introduced to investigate over-investment. These studies found that over-investment behavior does not only have negative impact on the whole macro-economy, but also affects company growth and damages the interests of all stakeholders. Therefore, it has important implications to study how to restrict companies' over-investment activities for enhancing the firm value and even promoting the healthy development

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of economics (Hart, 1995; Hadlock, 1998; Shleifer and Vishny, 1986).

Corporate governance is the basic regime to ensure the invest return of ownership. Hart (1995) showed that well corporate governance structures can constraint moral hazard originating from managers pursue their own interest and further cut down the over-investment (Hart, 1995). Although Chinese companies generally adopt corporate governance structure stemming from mature market, the effectiveness of governance mechanisms is still not obvious due to imperfection of Chinese market economy. It is hence crucial to figure out whether the current corporate governance regimes have effective restraint on firms' over-investment behavior in China.

In this study, we attempt to survey the effectiveness of corporate governance in food industry from the view of over-investment. Using the data from 2002 to 2009 of Chinese non-financial listed in food industry companies as samples, this study empirically studied the restriction effect of corporate governance on over-investment which was measured based on the Richardson model (Richardson, 2006). This study enriches the study of Chinese corporate governance and over-investment and also provides new evidence on the improvement of future corporate governance and the further reform to companies' governance.

MATERIALS AND METHODS

Theoretical hypothesis: In order to control the managers' residual control right, corporate ownership structure is an important institutional arrangement to solve managers' proxy behavior. In firm with high dispersed equities, because the minority shareholders have very few shares and the cost of monitor is far more than the return, hence, it is more likely to incur the "free-rider" behavior. However, relative concentrate equity can solve the free-rider behavior underlying in the dispersed equities and make the large shareholders have enough motive to monitor mangers and constrain their over-investment behaviors. Hosono *et al*. (2004) argued that the concentrate ownership have two positive roles, one is that concentrate ownership makes shareholders control the board and choose the managers with more ability, the other is that ownership concentration can improve the monitor ability of large shareholders and reduce the agency cost efficiently. Based on the above considerations, we formulate the following hypothesis.

H1: There is a negative relationship between ownership concentration and corporate over-investment: Shleifer and Vishny (1997) argued that the large shareholders can monitor the managers and prevent managers to sacrifice the interest of shareholders to seek their own benefits. Due to the difference of monitor motivation and ability among different identity of the ultimate owner, there are different restriction effects. In China, most of companies are state-controlled companies. There is serious phenomenon of internal control because of the absence of owner in state-controlled companies, which leads to the adequate motivation and ability to monitor the managers. However, in firm with non-state-controlled companies, they have clear property right and does not exist the absence of property right subject. The purpose of the large shareholders in non-state-controlled companies typically is to pursuit to the maximizing value and they can constrain managers' over-investment activities though effective monitor. Moreover, the large shareholders in non-state-controlled companies usually directly undertake the management in their companies or directly arrange agent to manage companies and which also restrict the over-investment. Based on the above discussion, we formulate the following hypothesis.

H2: The large shareholders with non-state can constrain the overinvestment, however, the lager shareholders with state cannot: The separation of control and ownership leads to the agency problem between shareholders and managers in the modern companies and the board is presented to cancel the conflict between shareholders and managers (Fama and Jense, 1983). As the core of corporate internal governance structure, the main responsibility of the board is to monitor and appoint mangers and provide the firm with decision making support system. The two important major of board is outside director and the leadership structure. As the outsider directors are not corporate internal person and do not controlled by managers, the outside directors would make impartial judgment and monitor managers to offset the lack of supervisors, hence, they can prevent the investment decision made by managers which are not good for firms. Furthermore, the outside directors generally have well education, skill and business experience, they can solve the business difficulties with their skills and knowledge for managers and choose the good decision from the bad decisions made by managers. As a result, they can constrain corporate over-investment. Based on the above consideration, we formulate the following hypothesis.

H3: There is a negative relationship between the ratio of outside and corporate over-investment: The other important aspect of board independence is whether the board separates the roles of CEO and chairman or not. A CEO who also serves as the board chairman would undermine the board independence, reduce the control of board to the managers and thus lead to the right expansion of managers and the opportunistic behavior of internal persons. Therefore,

the interests of the companies will be damaged by the CEO duality. However, the separation of CEO and chairman will improve the board independence by splitting the control right of managers, which ensure the monitor function of board to managers' decision making. As a result, managers' abuse of power which is caused by concentrate control is avoided and corporate over-investments are decreased effectively. Based on the above consideration, we formulate the following hypothesis.

H4: There is a negative association between the separation of CEO and chairman and corporate governance: As the companies' actual control, corporate managers do have important impact on over-investment. One of the effective mechanisms to ensure corporate managers maximizing the firm value is the reasonable incentive mechanism and the most important incentive mechanism to managers is the equity incentive. The conflict between shareholders and managers can be mitigated through the implementation of equity managers, so that managers can participate in the corporate decision as shareholders and constrain the adverse selection and moral hazard problems. Moreover, the modern principal-agent problems also can be solved. All of this results in the decrease of over-investments. Based on the above discussion, we formulate the following hypothesis.

H5: There is a negative association between the percent of managerial ownership and corporate over-investments: Board of supervisor which was the main supervisory institution of board governance can improve the level of corporate governance. In china, the board of supervisor is the major monitor institution that has to be established in listed companies. The main responsibilities of board of supervisors are to monitor the managers' and board' business management for shareholders and require the managers and board to correct companies' violations activities at any time. In addition, the large board of supervisor can own the board knowledge and information compared to the small board of supervisor. Hence, the constraint effect on managers' over-investments is more efficient. Based on the above consideration, we formulate the following hypothesis.

H6: There is a negative relationship between the size of bard of supervisor and corporate over-investment:

Data and methodology: In this study, we use the data from China Center for Economic Research (CCER) database during 2002 to 2009 of Chinese companies listed in Shanghai and Shenzhen Stock Exchange as the original sample and then perform the following screening process:

- Exclude the financial listed companies due to the different financial standards with other companies in china.
- Exclude the listed companies with missing data in 2002 to 2009.
- Exclude the listed companies with abnormal data. Based on the above screening process, we finally got 9263 sample observations. All the data needed are collected from CCER database, which provide firm-level financial and corporate governance information of Chinese listed companies.

Main variables: The measurement of corporate over-investment. Vogt (1994) surveyed the investment-cash flow sensitive by introducing the interaction between Cash Flow and investment opportunity (CFQ) and the positive coefficient of the interaction under lower investment opportunity implies that the firm exists over-investment behavior. However, his model cannot provide a direct measure of corporate over-investment. Fortunately, Richardson (2006) gives the model to direct measurement of corporate over-investment and we will use this method to measure the level of corporate over-investments. In his model, the corporate total investment is spit into two parts including investment to maintain existing assets in place and new investment. The main components of investment to maintain existing assets are amortization and depreciation and the new investment expenditure is decomposed into expected investment expenditure in new positive NPV projects and abnormal investment. The abnormal component of investment can be negative or positive. Negative (positive) values correspond to under- (over-) investment. And the investment expectation model is impacted by corporate growth, financial constraint, free cash flow *et al*. and the model of expectation model is presented in Eq. (1) and the residual value is the estimate of over-investment:

$$\begin{aligned} INVEST_{i,t} &= \alpha_0 + \alpha_1 Q_{i,t-1} + \alpha_2 LEVARGE_{i,t-1} \\ &+ \alpha_3 CASH_{i,t-1} + \alpha_4 AGE_{i,t-1} + \alpha_5 SIZE_{i,t-1} \\ &+ \alpha_6 RETURN_{i,t-1} + \alpha_7 INVEST_{i,t-1} \\ &+ \sum YEAR + \sum INDUSTRY + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where, $INVEST_{i,t}$ is contemporary investment, $Q_{i,t-1}$ is the proxy of previous growth opportunities $LEVERAGE_{i,t-1}$ as measures of previous financial leverage. $CASH_{i,t-1}$ is the previous cash flow, $AGE_{i,t-1}$ is the previous corporate age, $SIZE_{i,t-1}$ is the corporate size, $RETURN_{i,t-1}$ is the return of corporate stocks, $INVEST_{i,t-1}$ is the previous investment and *YEAR*, *INDUSTRY* is the dummy variables to control the year and industry effect. Table 1 present the definition and measurement of the variables.

Table 1: Definition and measurement of variables

Variables	Definition and measurement
$INVEST_{i,t}$	New investment expenditure/total assets at the year begin
$Q_{i,t-1}$	Tobin Q at the year begin
$LEVERAGE_{i,t-1}$	Total liabilities/total assets at the year begin
$CASH_{i,t-1}$	Free cash flow/total assets) at the year begin
$AGE_{i,t-1}$	The firm age at the year begin
$SIZE_{i,t-1}$	Natural logarithm of total assets at the year begin
$RETURN_{i,t-1}$	The stock return at the year begin
$INVEST_{i,t-1}$	New investment expenditure/total assets at the year begin
YEAR	Dummy variables
INDUSTRY	Dummy variables
$OVERINVEST_{i,t}$	The residual of Eq. (1)

Independent variables: The ownership Concentration (CR5) measured as the percentage of shares held by top five largest shareholders. We use a dummy variable to denote State ownership (STATE): if the ultimate owner of the corporate largest shareholder is state owned, it equals 0, 1 otherwise. The ratio of Outside Directors (OUTSIDE) is measured as percentage of independent directors on the board. The Separation between CEO and Chairman (SEPARATE) is measured by a dummy variable: if CEO and the board chairman roles are combined, it equals 0, 1 otherwise. We use the percentage of shares held by managers, directors and supervisors to measure the Managerial ownership (MHS). And the monitor ability of board of Supervisor (SSIZE) is measured by the size of the board of supervisor.

The model of regression on corporate governance and firm investment: To test our hypothesis, we use the following multi-regression models:

$$\begin{aligned} OVERINVEST_{i,t} &= \beta_0 + \beta_1 GOVERNANCE_{i,t} + \beta_2 FCF_{i,t} \\ &+ \beta_3 MC_FEE_{i,t} + \beta_4 OCCUPY_{i,t} \\ &+ \beta_5 SIZE_{i,t} + \beta_6 TURNOVER_{i,t} \\ &+ \sum YEAR + \sum INDUSTRY + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where, $OVERINVEST_{i,t}$ is the residual with positive value. $GOVERNANCE_{i,t}$ is the one of the governance variables describe above. In addition, according to the previous studies, we also consider some control variable that may be affect corporate overinvestment. First is the Free Cash Flow ($FCF_{i,t}$), corporate free cash flow creates conditions for managerial opportunisms and the over-investment is easily to happen when firms have ample free cash flow. Second is the agency cost. According to agency theory, Jensen (1976) argue that the separation of ownership and control increased the managerial agency costs. Mangers are inclined to waste the corporate resource to satisfy their expanding purposes and lead to the over-investment. Here, we use two converse variables to measure the agency cost: one is administrative expanses ($MC_FEE_{i,t}$) which is measured by the ratio of administrative expanses to sales, the other is the Occupy fund of the large shareholders ($OCCUPY_{i,t}$) which is measured by the other receivables to the total assets. The higher the ratio of administrative expanses to the total assets is, the more serious of the corporate over-investment. In contrast, the occupy fund of the large shareholders reduce the available funds of managers and constraint the corporate over-investment. Third is the firm Size ($SIZE_{i,t}$). The managers in small firm have more impulse to expand and lead to the over-investment. In this paper, we use the nature logarithm of total assets to as the proxy of firm size. Fourth, we control the assets Turnover ($TURNOVER_{i,t}$). There is a negative relation between firm assets turnover and corporate over-investment and the assets turnover is measured by the ratio of sale to the total assets. In addition, we also control the Year (*YEAR*) and Industry (*INDUSTRY*) effect.

EMPIRICAL RESULTS

The estimation of the expected investment on new project: Table 2 presents the regression results of Eq. (1). The level of over-investment is the residual of Eq. (2) and the independent variable is the investment on new projects.

According to Table 2, the coefficient of *Q* is positive and significant at 1% level, which denotes that the investment opportunity has a significant positive impact on firm's investment. The positive coefficient of CASH supports that the firm invest the ample assets for avoiding the additional supervisor and information caused by external finance (Heaton, 2002). The negative impact of corporate leverage on firm investment shows that the firm debts can constraint the corporate investment. In addition, the previous new Investment (INVEST), firm Size (SIZE) and stock Return (RETURN) also have negative influence on corporate investment. However, there is a negative impact of firm Age (AGE) on corporate investment.

Descriptive statistics of the main variables: Table 3 provides the summary statistic on the main variables used in this study. According to Table 3, mean of the OVERINVEST is zero due to the construction of the model. The average percentage of shares held by top five largest shareholders is 0.536, which denote that the top five large shareholders own half of the total shares on average and the ownership concentration is relative high. In all the sample companies, the state-controlled companies accounted for 69% and the non-state-controlled companies only account for 31%. The average percentage of outside directors in board is

Table 2: The estimate results of the expected investment on new project

Variables	Expected signal	Coefficient	t-statistics
INTERCEPT		-0.176***	-6.204
INVEST	+	0.204***	20.425
SIZE	+	0.010***	8.604
RETURN	+	0.014***	6.160
AGE	-	-0.003***	-8.555
LEVERAGE	-	-0.024***	-6.850
Q	+	0.009***	5.836
CASH	+	0.073***	6.861
YEAR		Control	
INDUSTRY		Control	
R SQUARE		0.155	
ADI. R SQUARE		0.151	
N		9263	

***: Denote significant levels at 1%

0.533, which means that there are more than half of directors in the board. And ten percent of the companies with the CEO duality imply most of the companies adopt the structure of separation of CEO and chairman. In addition, the average size of the board of supervisor is 4.2.

The results of the regression on the corporate governance and over-investment: We tested the multicollinearity among variables due to the high requirements on multicollinearity in multiple linear regressions and the results show the Variance inflation factor of all the variables less than 2, which means there exists no serious collinearity among the variables. In addition, we use Withe's heteroskedasti city correction technology in all the regressions to avoiding the heteroskedasticity.

Table 4 presents the regression result of Eq. (2). Model 1 tests the impact of all the control variables on corporate over-investment. Model 2 to 7 provide the relationship between CR5, DUALITY, OUTSIDE, MHS, SSIZE and corporate over-investment separately. According to model 2, the coefficient of the CR5 is negative and significant at the 10% level. This positive relationship between ownership concentration and over-investments show that the concentrate ownership plays a positive role and can constraint corporate over-investments effectively. So, it supports the hypothesis 1. In the model 3, the coefficient of the STATE is positive but cannot pass the significant test, which is not consistent with hypothesis 2. That's because, In general, the managers of non-state-controlled company usually are the founder of the companies. Although they can prevent the moral hazard of the managers, they are hesitated to expand the company and may invest the fund into project with negative NPV.

Table 3: Descriptive statistics of the main variables

Variables	Mean	S.D.	Max.	Min.	Observation
OVERINVEST	0.000	0.238	0.790	-0.647	9963
CR5	0.536	0.147	0.979	0.023	9963
STATE	0.690	0.462	1	0	9963
OUTSIDE	0.525	0.150	1	0	9963
DUAL	0.100	0.294	1	0	9963
MHS	0.010	0.058	0.771	0	9963
SSIZE	4.200	1.462	15.000	0	9963

S.D.: Standard deviation; Max.: Maximum; Min.: Minimum

Table 4: The result of the regression on corporate governance and over-investment

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
INTERCEPT	-0.127***	-0.125***	-0.132***	-0.134***	-0.123***	-0.128***	-0.126***
	(-5.140)	(-5.065)	(-5.193)	(-5.288)	(-4.948)	(-5.275)	(-5.105)
FCF	0.012**	0.012**	0.012**	0.012**	0.012**	0.012**	0.012**
	(2.085)	(2.093)	(2.097)	(-2.071)	(2.110)	(2.081)	(2.092)
TURNOVER	0.002	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002
	(-0.848)	(-0.666)	(-0.796)	(-0.828)	(-0.851)	(-0.871)	(-0.833)
MC_FEE	-0.004	-0.003	-0.004	-0.004	-0.004	-0.004	-0.003
	(-1.588)	(-1.581)	(-1.596)	(-1.586)	(-1.591)	(-1.583)	(-1.575)
OCCUPY	-0.106***	-0.107***	-0.106***	-0.106***	-0.106***	-0.105***	-0.106***
	(-6.824)	(-6.894)	(-6.855)	(-6.823)	(-6.894)	(-6.790)	(-6.825)
SIZE	0.006***	0.007***	0.006***	0.006***	0.007***	0.006***	0.006***
	(5.703)	(5.879)	(5.753)	(5.715)	(5.814)	(5.728)	(5.725)
CR5		-0.015*					
		(-1.851)					
STATE			-0.002				
			(-0.805)				
OUTSIDE				0.010			
				(1.252)			
DUALITY					-0.008**		
					(-2.209)		
MHS						-0.011**	
						(-2.098)	
SSIZE							-0.002
							(-0.564)
Adj R square	0.009	0.010	0.009	0.009	0.010	0.010	0.009

***: Significant levels at 1%; **: Significant levels at 5%; *: Significant levels at 10%

Table 5: The regression results of the robust check

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
INTERCEPT	-1.230**	-1.197**	-1.379***	-1.388***	-1.144**	-1.158**	-1.232**
	(6.161)	(5.815)	(7.379)	(7.499)	(5.296)	(5.402)	(6.157)
FCF	0.273**	0.274**	0.276**	0.271**	0.276**	0.275**	0.273**
	(5.280)	(5.301)	(5.379)	(5.203)	(5.388)	(2.118)	(5.277)
TURNOVER	-0.036	-0.030	-0.033	-0.036	-0.037	-0.034	-0.037
	(0.712)	(0.469)	(-0.573)	(-0.673)	(-0.720)	(-0.615)	(-0.713)
MC_FEE	-0.046	-0.046	-0.047	-0.046	-0.047	-0.047	-0.046
	(0.816)	(-0.812)	(-0.844)	(-0.819)	(0.829)	(-0.842)	(-0.817)
OCCUPY	-1.810***	-1.835***	-1.831***	-1.810***	-1.810***	-1.832***	-1.810***
	(28.895)	(29.538)	(29.848)	(28.889)	(28.847)	(29.505)	(28.894)
SIZE	0.049**	0.053**	0.054**	0.049**	0.051**	0.046**	0.048**
	(4.836)	(5.605)	(5.826)	(4.900)	(5.347)	(4.425)	(4.710)
CR5		-0.261*					
		(2.646)					
STATE			0.068				
			(1.877)				
OUTSIDE				0.249			
				(2.280)			
DUALITY					-0.159**		
					(4.817)		
MHS						-0.564*	
						(3.480)	
SSIZE							0.003
							(0.002)
YEAR	YES	YES	YES	YES	YES	YES	YES
INDUSTRY	YES	YES	YES	YES	YES	YES	YES
Cox and Snell R square	0.015	0.015	0.015	0.015	0.016	0.015	0.015

***: Significant levels at 1%; **: Significant levels at 5%; *: Significant levels at 10%

The result of the model 4 does not support the hypothesis 3 that there is a negative relationship between the ratio of the outside directors on the board and corporate over-investment. It may be because that the outside directors in Chinese companies are just the "vase directors" without taking the proper responsibility. Because outside directors are not the executive staff in the company and know little about the real situation of the company. In addition, they seldom participate in the corporate decision management and cannot monitor the managers inefficiently. Hence, they cannot restrict the corporate over-investment. According to model 5, the coefficient of the DUALITY is 0.008 and significant positive at the 5% level, which indicates that the separation of CEO and chairman can restrict corporate over-investment effectively and consistent with the hypothesis 4. In the model 6, the coefficient of the MHS is negative and significant at the 5% level, which supports the hypothesis 5 that there is a negative relationship between the ratio of the shares held by managers and corporate. However, although the coefficient of SSIZE is negative, it does not pass the significant test. Therefore, the hypothesis 6 is not supported by the result. That's may be, members of the supervisory committee are choose from the internal person and their behavior are controlled by the managers. Hence, they cannot play the real monitor role and would not constraint corporate over-investment.

According to Table 4, the coefficients of the FCF in all the models are positive and significant at the 5% level, which prove the "free cash flow hypothesis". The OCCUPY has a negative impact on corporate over-investment, which means that the OCCUPY can constraint the corporate over-investment in some extend due to their occupation of the company's fund and decrease the available fund of managers. Moreover, the firm size has a significant positive impact on corporate over-investment according to all the seven models. However, we do not that MC_FEE and TURNOVER have impact on corporate over-investment.

Robust check: In order to ensure the reliability of the results, we use another proxy of corporate overinvestment. It is a dummy variable and equals 1, if the residual of the equation 1 is positive and 0, otherwise. We conduct the equation 2 by using binary logistic analysis. Table 5 provides the regression results.

According to Table 5, the coefficient of CR5 in model 2 is negative and significant at the 10% level, which further supports the hypothesis that there is a negative relationship between ownership concentration and corporate over-investment. The coefficient of DUALITY in model 5 is negative and significant at the 5% level, which supports the hypothesis 4. In addition, the coefficient of MHS in model 6 is also negative and significant at the 1% level, which indicate the there is a negative relationship between MHS and corporate over-investment. However, findings of model 2, 3 and 6 indicate that H2, H3 and H6 are not supported, which is similar to the previous conclusions. Furthermore, the results of all the control variables are consistent with the above findings.

Table 6: Result of regression on corporate governance and over-investment in monopoly industries

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
INTERCEPT	-0.030***	-0.028***	-0.027***	-0.029***	-0.024***	-0.022***
	(-5.288)	(-5.175)	(-5.072)	(-5.225)	(-5.059)	(-5.030)
FCF	0.061*	0.059*	0.061*	0.062*	0.061*	0.061*
	(1.701)	(1.638)	(1.721)	(1.734)	(1.715)	(1.700)
TURNOVER	-0.014*	-0.014*	-0.015*	-0.014*	-0.016*	-0.015*
	(-1.725)	(-1.804)	(-1.871)	(-1.827)	(-1.923)	(-1.866)
MC_FEE	-0.003	-0.003	-0.004	-0.004	-0.004	-0.003
	(-0.449)	(-0.437)	(-.502)	(0.007)	(-0.489)	(-0.466)
OCCUPY	-0.189**	-0.173*	-0.192**	-0.184*	-0.190**	-0.188**
	(-1.997)	(-1.751)	(-2.016)	(0.095)	(-2.007)	(-1.988)
SIZE	0.003***	0.001***	0.001***	0.003***	0.001***	0.001***
	(5.588)	(5.052)	(5.146)	(5.004)	(5.205)	(5.227)
CR5	-0.044					
	(-0.907)					
STATE		-0.010				
		(-0.582)				
OUTSIDE			-0.016			
			(-0.363)			
DUALITY				-0.016**		
				(2.020)		
MHS					-0.017*	
					(-1.845)	
SSIZE						-0.006
						(-0.383)
Adj R square	0.010	0.010	0.010	0.011	0.011	0.010

***: Significant levels at 1%; **: Significant levels at 5%; *: Significant levels at 10%

CONCLUSION

This study introduces the Richardson model into investment decision making process to constrain overinvest problems in the listed companies. Using the data from 2002 to 2009 of Chinese non-financial listed companies as samples, this study empirically studied the restriction effect of corporate governance on over-investment. According to the empirical analysis demonstrates, we suggest that Chinese companies should accelerate to conduct equity incentive to manager, adopted the leadership structure with the separation of CEO and chairman and the shares should not be too scatter. In addition, in order to make the independent directors and supervisor play a real role, the Chinese companies should improve and perfect the independent director and supervisor regime, formulate the employment of the independent director and supervisor and establish the accountability system and risk bear mechanism of independent directors and supervisor.

RECOMMENDATIONS

The above conclusions show that some corporate governance would constraint corporate over-investment effectively. While the industry competition and marketization level has impact on the efficient of corporate governance. Combined with the previous studies, we further examine the constraint effect of corporate governance on corporate over-investment.

In china, the relative lower competition on monopoly industry weakens the effect of corporate governance. The electricity, gas and water production and supply is divided into monopoly industries and the others belong to competitive industries (Yang *et al*., 2010).

Following the above rule, the total sample is dividend into two sub-samples for the competitive industry and monopoly industry. Then, we conduct the regression and we only report the results of the monopoly industries because the results of the competitive industry are similar to the total sample. Table 6 lists the results.

In the sample of the monopoly industry, the coefficients of STATE, OUTSIDE and SSIZE are not significant, which indicate that the state-controlled, outside and board supervisor have no constraint impact on corporate over-investment. The coefficient of DUALITY and MHS are negative and significant at the 5 and 10% level separately, which are consistent with the results of the total sample. It denotes that the separation of CEO and chairman and equity motivation to managers can restrict corporate over-investment in the monopoly industries. Although the coefficient of the ownership concentration is negative and is not significant. This result is not similar to the total sample and indicates that the ownership concentration has no impact on corporate over-investment in monopoly industries. Most of the companies in monopoly companies are state-controlled. There is a serious phenomenon of internal control due to the lack of owner in state-controlled companies. So the corporate over-investment cannot be constraint efficiently due to the lack of the monitor motivation and ability to managers.

As one of the most important external governance, the marketzation level of the company location has important impact on the operate efficiency of internal corporate governance. The improvement of the

Table 7: Regression of corporate over-investment on corporate governance in low marketzation level

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
INTERCEPT	-0.293***	-0.296***	-0.308***	-0.291***	-0.300***	-0.300***
	(-5.163)	(-5.166)	(-5.386)	(-5.137)	(-5.312)	(-5.302)
FCF	0.019*	0.019*	0.019*	0.020*	0.019*	0.019*
	(1.605)	(1.592)	(1.597)	(1.623)	(1.596)	(1.608)
TURNOVER	-0.002	-0.003	-0.002	-0.003	-0.002	-0.002
	(-0.296)	(-0.486)	(-0.442)	(-0.510)	(-0.438)	(-0.424)
MC_FEE	-0.011**	-0.011**	-0.011**	-0.011**	-0.011**	-0.011**
	(-2.136)	(-2.164)	(-2.119)	(-2.110)	(-2.134)	(-2.123)
OCCUPY	-0.107***	-0.104***	-0.106***	-0.107***	-0.105***	-0.106***
	(-3.485)	(-3.366)	(-3.450)	(-3.472)	(-3.431)	(-3.439)
SIZE	0.015***	0.014***	0.014***	0.010***	0.014***	0.015***
	(5.490)	(5.325)	(5.445)	(5.521)	(5.439)	(5.454)
CR5	-0.021**					
	(-1.914)					
STATE		-0.003				
		(-0.547)				
OUTSIDE			0.013			
			(0.814)			
DUALITY				-0.014*		
				(-1.804)		
MHS					-0.031	
					(-0.385)	
SSIZE						-0.003
						(-0.391)
Adj R^2	0.026	0.025	0.025	0.026	0.025	0.025

***: Significant levels at 1%; **: Significant levels at 5%; *: Significant levels at 10%

marketzation level can strengthen internal corporate governance structure. In China, the marketimation process levels of different provinces are different. Following the previous studies, we have measured the marketzation level. We divide the sample into two sub-samples, one is composed by the companies whose province marketzation level is over the median value and the other is composed by other companies. Then, we conduct the regression. Table 7 provides the regression results.

According to Table 7, the coefficients of STATE, OUTSIDE, SSIZE are not significant in all sample, which are similar to the results of total samples and implicate that the STATE, OUTSIDE and SSIZE have no impact on corporate over-investment. The coefficient of the ownership concentration and the separation of CEO and chairman are negative and significant at the 5% level and 10% level separately, which are also consistent with the results of the total sample and indicate that the ownership concentration and the separation of CEO and chairman also can constraint the corporate over-investment even in the companies located in the province with lower marketzation level. However, the coefficient of the MHS is negative but not significant, which show that equity incentives to managers in the region with lower marketzation level cannot constraint corporate over-investment effectively. It may because, in the region with lower marketzation level, the increase of the ratio of the managerial ownership may decrease the restriction of the external manager market and internal control to managers. It is easily to incur managerial entrenchment due to the weaker internal and external constraint, so, the corporate over-investment cannot be constraint efficiently.

Using the data from 2002 to 2009 of Chinese non-financial listed companies as samples, this paper empirically studied the restriction effect of corporate governance on over-investment which was measured based on the Richardson model (Heaton, 2002). The result show that, there is an significant negative relation between ownership concentration and over-investment, that is, concentrated ownership can restrict the over-investment; unlike the previous findings, the type of the owner has no impact on corporate over-investment. Moreover, the outside did not play a role in constraining corporate over-investment. The splitting of CEO and chairman can help to impede overinvestment of listed companies. There is a significant negative correlation between managerial stock ownership and over-investment, in other word, the over-investment in the company with higher proportion of managerial owned share is significantly higher than that of company with lower proportion of managerial owned share. Board of supervisors cannot restrict the over-investment of listed companies effectively, further evidence show that industry competition and market process can influence the restriction effect of corporate governance on over-investment.

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