



CONSTRAINTS FUNCTION OF REPUTATION ON EMBEZZLEMENT BEHAVIOR OF CONTROLLING SHAREHOLDERS: A STUDY ABOUT THE LISTED COMPANIES OF CHINA

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ABSTRACT

In China, listed companies in China have the behavior of embezzlement for a long time. In the micro level, this seriously damages the interest of creditor and minority shareholders. In the macro level, this also harms the healthy development of the capital market and the national economy. So, it is very important to study the constraint for embezzlement behavior of controlling shareholders. Among many constraints mechanisms, reputation mechanism is considered to be the most perfect governance mechanisms because of its advantage of low cost and big punishment. Through the theoretical study, the game study and empirical study, this research will examine the reputation's constraints function for embezzlement behavior of controlling shareholders. Theoretically reputation has constraints function for embezzlement behavior of controlling shareholders, and the constraints function is reflected in reputation of controlling and reputation of enterprises. In Chinese listed companies, the accumulated reputation of controlling shareholders has constraints function for embezzlement behavior of controlling shareholders. However, the reputation of enterprises is not well reflected.

JEL Classification

C58, E40, G29

1. INTRODUCTION

In the early 21st century, nearly half of the controlling shareholders of listed companies embezzled the company's assets. The Commission also issued a policy to control embezzlement behavior of controlling shareholders. With the growth of the market and improvement of corporate governance, embezzlement behavior of controlling shareholders got some control. However, in recent years, the development of China's economy was slow down. The lack of funds of controlling shareholder is serious problem, so controlling shareholders reached to the listed companies, and embezzlement behavior increased. As per the year 2012 annual reports of listed companies show that more than 300 companies have embezzlement phenomenon on varying degrees and many of which occupied the company assets for many years. Therefore, embezzlement behavior of controlling shareholders is universal in China's capital market, and seriously harming the interests of foreign investors.

In the study of constraints on the embezzlement behavior of controlling shareholders, perfect governance mechanisms is considered to be the best solution because of its lower cost and greater punishment. Good reputation could reduce financing costs and difficulties of listed companies, while bad reputation would increase financing difficulties, and increase the risk of bankruptcy. Armando (2000) studied agency problem of the controlling shareholder and minority shareholder. The study found that the legal system unlikely has protecting role for minority shareholders, but reputation may affect embezzlement behavior of controlling shareholders through share price. Siegel (2005) found that reputation has excitation and constraints role, and is effective mechanism in restricting embezzlement behavior of controlling shareholders of Mexico. The sued listed companies due to the illegal occupation of the controlling shareholder cannot be trusted by investors, so it is difficult for them to attract financing in a very long period of time. The reputation of companies is better who acted well after listing and their refinancing scale increased more than 30% as compared to last year. Diamond (1989) and Francis (2008) found that, for the controlling shareholder of private enterprises, the relationship among corporate reputation and business lifetime is positive. Companies which had long continuing operations time would focus more on corporate reputation building. Dyck (2008) founds that the reputation of managers could effectively govern the agency problem, and this governance role was played by the media. Juan Bautista (2010) thought that a negative reputation would be found when embezzlement behavior of controlling shareholders happened. In the domestic research, Xiao Hailian (2007) found that reputation mechanisms had a positive effect on the governance of embezzlement behavior of controlling shareholders. Jia Ming (2008, 2010) introduced reputation in his model and found that the best occupation level of the controlling shareholder would reduce, but its support for listed companies would increase. So the reputation function could well constrained the behavior of ultimate controlling shareholder and protect the interests of minority shareholders and investors. Wang Yueping (2011) put the corporate reputation to the reputation of controlling shareholder, reputation of manager and reputation of independent directors. The current study explore the reputation's protection function, and establish a repeated game theory of controlling shareholders and minority shareholders, that proved reputation's constraints function. In empirical terms, usage of audit opinion and overseas market to measure reputation is universal. Reputation occupied a significant constraints function to controlling shareholders. Lei Xintu (2012) used experiment innovatively to study reputation's constraints function and found that the cost of the negative reputation has constraints function to compact body.

In general, previous studies on embezzlement behavior of controlling shareholders, scholars only discussed the role of reputation played in embezzlement behavior of controlling shareholders, but had not discussed the constraint mechanism of reputation in depth. In the empirical study of reputation's constraints function, the measurement on reputation usually uses dummy variables, which is not much accurate. Therefore, this paper attempts to analyze the reputation's constraints function to embezzlement behavior of controlling shareholders. The results could provide a guideline for the regulators and investors.

2. THEORETICAL ANALYSIS

(1) Analysis from Economics Perspective

From the perspective of information economics, when the information is incomplete, controlling shareholders cannot be perceived as the minority shareholders, and controlling shareholder can establish a reputation in the beginning stages of the game to give a good impression of minority shareholders in exchange of long-term gains. Therefore, controlling shareholders will maintain a good reputation to maintain its image and corporate joints. It not only can increase the bargaining power of controlling shareholder in the market, but also can make long-term interests and meet their utility needs. Controlling shareholders possess initiative to choose KMRW reputation model. If they adopt the cooperative behavior, it will reduce current income. Their uncooperative behavior distract the investors, resulting reduced future earnings. After weighing, controlling shareholders may establish reputation in the game.

(2) Analysis from Management Perspective

Maslow's hierarchy needs in Management is a classical model. It considers that the needs of people can be divided into different levels. After getting the basic life-support system, people often begin to pay attention to pursue a higher level of need (spiritual need). Controlling shareholders of listed companies are at higher status; no matter it is a person or business. The first three levels are basically satisfied, and therefore the lower levels of demand are already met. It means that controlling shareholders have lack of motivation to conduct embezzlement behavior to get benefits. Demand has been shifted towards well respected reputation. From a strategic management perspective, reputation binding shows some evidence, and it is thought reputation plays an important role in industrial competition. Established reputation can also prevent the entry of outsiders. Unlike other assets, formation of reputation needs a long-time to accumulate, and it is difficult to imitate, so the effect is enormous. According to the strategic point of view of enterprises, and competitive advantage theory, controlling shareholder might support the enterprises to get a reputation instead of conducting embezzlement.

(3) Analysis from Accounting Perspective

Reputation is a comprehensive evaluation for enterprises based on already available information. When conducting analysis from accounting perspective, the evaluators of reputation are mainly the users of financial information, small shareholders and creditors. Minority shareholders are the participant of capital markets and their evaluation is the capital market reputation (not including the bond market) as evaluators' cognitive collection for enterprises. Reputation evaluation of creditors called debt market reputation (Including the bond market). From the perspective of the evaluator's reputation, reputation can be divided into types; one is capital market reputation and second is debt market reputation. To embezzle or support listed companies depends largely on the size of embezzlement costs. Minority shareholders collect the information of poor or negative reputation enterprises, and reflect it in the capital market while selling stocks. As a result, new investors flew away, inevitably causing the share price decreases and increase the cost of financing and risk of corporate mergers and acquisitions.

Banks and other creditors may reduce its borrowing or increase its financing costs, which would increase overall financing costs and risk of the enterprise. In short, company with a good reputation will focus on maintaining it in order to avoid the loss of reputation and its enormous negative costs.

3. GAME THEORY MODEL

The characteristics of the game between the two sides

The behavior of the controlling shareholder who obtains private benefits, will directly affect the interests of investors. This affect is direct for medium and small shareholders and indirect for creditors. Medium and small shareholders and creditor play an important role in the capital and debt markets, and they also run constraints function on the embezzlement behavior of controlling shareholders through the capital and debt markets. So, the constraints function of reputation on embezzlement behavior of controlling shareholders is the result of the game between the controlling shareholders, the medium and small shareholders and creditor (outside investors). The game has two kinds of characteristics: (1) asymmetric information (2) the game repeats many times. Based on the characteristics of the game for the two sides, current paper uses KMRW model to analysis the game between the controlling shareholders and the outside investors. In order to analysis the result of the game theory equilibrium and condition, we can apply the function and mechanism of the reputation.

The establishment of the game model

In the game, the controlling shareholders hold more information than the outside investors, so they can choose "occupation" strategy (embezzlement) or "no occupation" strategy (no embezzlement). However, outside investors choose the "action" strategy (punish controlling shareholder) or "no action" strategy (not to punish the controlling shareholder) based on the behavior of the controlling shareholders. In order to simplify the problem, put forward the following assumptions and do not change the nature of the problem situation.

1) Outside investors are rational. They belong to the non-cooperative participants and pursuit the maximizing the interests of their own, but they don't have game initiative. However, controlling shareholders have information advantage, they can decide to cooperate or not.

2) Outside investors expect that the reasonable or the normal profit of controlling shareholder is R^e , suppose $R^e \in [0,1]$; the normal profit of the outside investors is R_s and $R_s \in [0,1]$.

3) when the controlling shareholder has the behavior of embezzlement, they will get embezzlement income R , at the same time, the loss of being embezzled of outside investors is also R , and $R \in [0,1]$; at the same time, the cost of the embezzlement of

the controlling shareholder is C , and it is the cost in terms of loss of the reputation, which make $C = kR, k \in [0,1]$, where k is the measure of the size of the company's reputation.

4) when the controlling shareholder has the behavior of embezzlement, the outside investors take action and the income they get is $R_a, R_a \in [0,1]$; while outside investors also pay the costs when they take action and the cost is $C_a, C_a \in [0,1] (R_a > C_a)$.

5) The game between the outside investors and the controlling shareholder is a process of repeated game. According to the order of the game, in the first stage, controlling shareholders first choose to incorporate or not, then outside investors respond it, and choose to take action or not. After two sides of the game knowing the previous result, they process the next stage of the game and continue until the last stage.

According to the assumption and the strategic analysis, two sides of the game can get different income when they make different choices. When the controlling shareholders choose "embezzlement" strategy, the outside investors choose the "action" strategy. When the controlling shareholders choose "no embezzlement" strategy, the outside investors choose the "no action" strategy (see figure-1). If the game with two sides has only one stage, the game equilibrium is (embezzlement, action), (no embezzlement, no action).

Figure 1: Matrix of Income of the One Stage Game

		Controlling shareholders	
		Embezzlem	No Embezzlement
Outside investors	Action	$R_s - R + R_a - C_a, R - C - R^e$	$R_s - C_a, R^e$
	No Action	$R_s - R, R$	R_s, R^e

Because of the information advantage of the controlling shareholders, they can decide to choose "embezzlement" strategy or "no embezzlement" strategy. So we can get the game equilibrium by only analyze the behavior of the controlling shareholders.

From the above analysis we can find that, if the game only has one stage, the function of the controlling shareholders income is $V = b(R - C - R^e) + (1 - b)R^e$. Suppose that the function of the controlling shareholders income is the function of the controlling shareholders utility. So the utility of one stage game of controlling shareholders can be found through formula-1.

$$W = b(R - R^e) + (1 - b)R^e - bkR \quad (1)$$

In the formula-1, R is the actual embezzlement income of controlling shareholder, R^e is the reasonable profits or the normal profit of controlling shareholder that the outside investors expect and b reflects the different kinds of controlling shareholders while $b = 0$ reflects that the controlling shareholders do not take embezzlement action, so they can be called high grade controlling shareholders. $b = 1$ reflect that the controlling shareholders do take embezzlement action, so they can be called low grade controlling shareholders. At the same time, suppose that the priori probability of $b = 0$ is p_0 (p_0 is the reputation of the controlling shareholders), and the priori probability of $b = 1$ is $1 - p_0$ (it shows that at the stage if $t = 0$, the probability of outside investors consider controlling shareholders as high grade controlling shareholder is p_0 , and the probability of outside investors consider controlling shareholder as low grade controlling shareholders is $1 - p_0$).

Perfect Bayesian Equilibrium

Suppose that the game can proceed T times. On the one stage game analyses, we can only conform the possibility of the controlling shareholders be high grade or low grade, but not conform the probability of high or low controlling shareholder take embezzlement action or not. Now suppose that at t stage the low grade controlling shareholders choose not to take embezzlement action, its probability (the probability of bad men pretend to be good) is y_t ; the probability of outside investors thinking that the low grade controlling shareholder is not taking embezzlement action is x_t . So, at the game equilibrium, $x_t = y_t$. If at the t stage, outside investors do not suffer the embezzlement of the controlling shareholders then we use Bayes' theorem to calculate the probability of outside investor's thinking that the controlling shareholder is high grade at $t + 1$ stage (See formula-2).

$$p_{t+1}(b = 0 | R_t = 0) = \frac{p_t \times 1}{p_t \times 1 + (1 - p_t)x_t} \geq p_t \quad (2)$$

From formula-2 we can draw that if at the prior stage the controlling shareholder does not choose the embezzlement strategy then the probability that the outside investor access the controlling shareholder as high grade in the next stage is larger than prior stage. It means that if the controlling shareholder does not choose the embezzlement strategy, the reputation will increase. (When $x_t < 1$, the probability is strictly increasing; if $x_t = 1$ then the probability remain equal).

If in the t stage the controlling shareholder choose the embezzlement strategy then we can calculate the probability of the next period with formula-3.

$$p_{t+1}(b=0 | R_t=0) = \frac{p_t \times 0}{p_t \times 0 + (1-p_t)x_t} = 0 \quad (3)$$

From formula 3 we can calculate that if in the prior stage the embezzlement action was observed by the outside investor then he can access the kind of controlling shareholder (high grade or low grade).

Now we will analysis the game equilibrium of the last two stages (T stage and $T-1$ stage). In the last stage, that is to say in the T stage, the no- embezzlement reputation set up by controlling shareholder makes no sense without future income. This moment, the best choice of low grade controlling shareholder and the game equilibrium of first stage are equal. This means that the best choice of low grade controlling shareholder is $R = b = 1$, and the rational income of corresponding investor is $R_T^e = 1 - p_T$. So, we can calculate the utility of low grade controlling shareholder through formula-4.

$$W_T = bR_T - R_T^e + (1-b)R_T^e - bkR_T = p_T - k \quad (4)$$

Because of $\partial W_T / \partial p_T = 1 > 0$, the utility of the low grade controlling shareholder is an increasing function of p_T where p_T is the awareness of outside investor about the quality of controlling shareholder. So, we can access it as reputation, and the utility of the low grade controlling shareholder is dented as an increasing function. We can conclude that higher the reputation a controlling shareholder have in the prior stage, get more utility in the final stage. Because of this controlling shareholder set higher reputation in prior stage. If in the prior stage the low grade controlling shareholder choose the embezzlement strategy, then $p_T = 0$, means that the low grade controlling shareholder will not get any additional embezzlement income in the final stage.

On the bases of the above discussion, we can analyze the choice of controlling shareholder in the $T-1$ stage. Suppose in the $T-1$ stage, the low grade controlling shareholder does not choose the embezzlement strategy, then $p_{T-1} > 0$. At this time, the income of controlling power of outside investor can be calculated through formula-5.

$$R_{T-1}^e = 1 \times (1 - p_{T-1})(1 - x_{T-1}) \quad (5)$$

Suppose that the discount factor of controlling shareholder is δ . We first consider the pure strategy in order to simplify the problem and calculate it.

It means that $y_t = 0$ or $y_t = 1$. If in the $T-1$ stage the low grade controlling shareholder choose to take embezzlement action then $y_{T-1} = 0$, and $R_{T-1} = 1$, which leads to $p_T = 0$ (in the $T-1$ stage, after the embezzlement action observed, the controlling shareholder gets low grade but not high grade in the T stage). At this time, the utility summation of low grade controlling shareholder in the last two stages can be calculated through formula-6.

$$W_{T-1}(1) + \delta W_T(1) = 1 - R_{T-1}^e - k + \delta(p_T - k) = 1 - R_T^e - k - \delta k \quad (6)$$

If in the $T-1$ stage the low grade controlling shareholder did not choose to take embezzlement action, $y_{T-1} = 1$, $R_{T-1} = 0$, then the utility summation of low grade controlling shareholder in the last two stages are: $W_{T-1}(0) + \delta W_T(1) = -R_{T-1}^e + \delta(p_T - k)$, when $R_{T-1} = 0$ is better than $R_{T-1} = 1$, it can be calculated through formula-7:

$$-R_{T-1}^e + \delta(p_T - k) \geq 1 - R_{T-1}^e - k - \delta k \quad (7)$$

$$\text{Then } p_T \geq \frac{1-k}{\delta}.$$

Because under the condition of equilibrium, $x_t = y_t$, outside investor expecting his business probability is equal to the actual choice of controlling shareholder. So under the condition of equilibrium, $y_{T-1} = 1$ and $x_{T-1} = 1$, then $p_T = p_{T-1}$. So the above conditions can be written as: $p_{T-1} \geq \frac{1-k}{\delta}$.

If in the $T-1$ stage, the probability which the outside investor access controlling shareholder as high grade is the reputation of controlling shareholders, and $p_T \geq \frac{1-k}{\delta}$, controlling shareholder as low grade could pretend to be possessing high grade, it means that bad man pretend to be a good man to obtain the extra embezzlement earnings of the final stage. In other words, the better the reputation of a controlling shareholder is, the more actively they maintain their reputation.

It shows that the reputation has the function of motivation, and good reputation will motivate controlling shareholder and enterprises to maintain their reputation.

Now consider the mixed strategy, if $p_T = \frac{1-k}{\delta}$, embezzlement and not embezzlement in the same utility, then any $y_{T-1} \in [0, 1]$, utility is the same, and is the best. But because in equilibrium $x_{T-1} = y_{T-1}$, then put $p_T = \frac{1-k}{\delta}$ into the formula-2, and formulate formula-8:

$$x_{T-1} = y_{T-1} = \frac{\left(\frac{\delta}{1-k} - 1\right) p_{T-1}}{1 - p_{T-1}} \quad (8)$$

As we can see in formula-8, when $\delta > 1-k$, y_{T-1} and p_{T-1} have direct ratio relation, it means that the probability an outside investor consider controlling shareholder as high quality controlling shareholders is high, and inferior controlling shareholder selected for not embezzlement action in higher probability. It exist when p_{T-1} is more close to $\frac{1-k}{\delta}$, y_{T-1} is closer to 1. When $p_T > \frac{1-k}{\delta}$, there is only a pure equilibrium strategy that the controlling shareholder select not to embezzlement, and at this time there is no mixed equilibrium strategy.

We can conclude that, if $p_{T-1} \geq \frac{1-k}{\delta}$ and $\delta > 1-k$, then the best choice for controlling shareholder in the $T-1$ stage is "No Embezzlement" strategy, so the controlling shareholder can successfully maintain his reputation.

Considering the last three stages as its condition is the same as the last two stages. By analogy, under the same conditions, all the $t < T-1$ stages, the controlling shareholder has "No Embezzlement" strategy as the best choice. So, if $p_0 \geq \frac{1-k}{\delta}$, then the perfect Bayesian equilibrium of controlling shareholder is as follows:

The choice of high grade controlling shareholder (good men without embezzlement):

$$R_0 = R_1 = R_2 = \dots = R_{T-1} = R_T = 0$$

The low grade controlling shareholder (bad men with embezzlement):

$$R_0 = R_1 = R_2 = \dots = R_{T-1} = 0, R_T = 1$$

At this time, the rational income and the Posterior probabilities are:
 $R_0^e = R_1^e = \dots = R_{T-1}^e = 0, R_T^e = 1 - p_T = 1 - p_0$

So, in the equilibrium, $p_0 = p_1 = \dots = p_{T-1} = p_T$, and in the disequilibrium path, if $R_T = 1$, then $p_{t+1} = 0$. At this point, the total utility of high grade controlling shareholder is 0 and discounted utility of low grade controlling shareholder is $\delta^T (p_T - k)$, or $\delta^T (p_0 - k)$.

The derivation of Bayesian equilibrium is conditional. Seeing the condition $p_0 \geq \frac{1-k}{\delta}$ we know that, when k is large, the reputation of enterprises is good and when the cost of embezzlement is high, the controlling shareholder would like to set up the high reputation. When p_0 is large, the higher the reputation that the controlling shareholders accumulated before and the less utility they will have because of the embezzlement. So, the probability that the controlling shareholder choose to take embezzlement action is small. Next, we will consider the situation that the condition does not meet. Similarly, we can deduce that if the condition of $p_0 < \frac{1-k}{\delta}$, then the perfect Bayesian equilibriums are:

The choice of high grade controlling shareholder (good men without embezzlement):

$$R_0 = R_1 = R_2 = \dots = R_{T-1} = R_T = 0$$

The low grade controlling shareholder (bad men with embezzlement):

$$R_0 = R_1 = R_2 = \dots = R_{T-1} = R_T = 1$$

At this time, the rational income and the Posterior probabilities are:

$$\text{When } R_0^e = 0, R_0^e = 1 - p_0; R_1^e = \dots = R_{T-1}^e = R_T^e = 0;$$

$$\text{When } R_0^e = 1, R_0^e = 1 - p_0; R_1^e = \dots = R_{T-1}^e = R_T^e = 1;$$

$$\text{When } R_0 = 1, p_0 = p_1 = \dots = p_{T-1} = p_T = 0;$$

$$\text{When } R_0 = 0, p_0 = p_1 = \dots = p_{T-1} = p_T = 1$$

We can observe that, game becomes complete information game at $t=1$ stage, at this time, utility of high grade controlling shareholder is constant, and the utility of low grade controlling shareholder can be calculated through formula-9:

$$\sum_{t=0}^T \delta^t W_t = (p_0 - k) - k\delta - \dots - k\delta^T = p_0 - k \frac{1 - \delta^T}{1 - \delta} \quad (9)$$

(4) Equilibrium analysis

In the light of above discussion, we know that high quality controlling shareholder can't choose occupy at any time, because the desire for the benefit is far less than desire for reputation. When $p_0 \geq \frac{1-k}{\delta}$, poor quality controlling shareholder can't choose occupy

and set out to build reputation at the $T-1$ stage for the inferior big shareholders. At the last stage controlling shareholder release their reputation at once. When $p_0 < \frac{1-k}{\delta}$, the

accumulated reputation and the cost of reputation losses has not been enough to stem the behavior of embezzlement of controlling shareholder. In other words, the inferior controlling shareholders have been choosing occupation from the first phase. We found that it is between 0 and 1, but is close to 1 in reality when analyzing the condition of two kinds of the utilities of the equilibrium level. When k is close to 1, the level of the effect of

p_0 is less than $\frac{1-k}{\delta}$ that is far less than the level of its effect when p_0 greater than $\frac{1-k}{\delta}$. The higher of the corporate reputation, the more likely that controlling

shareholder will build a reputation in order to increase the effectiveness in the $T-1$ stages and conduct embezzlement in the final phase. When k is close to 0, the level of the effect of p_0 is less than $\frac{1-k}{\delta}$ that is far more than the level of its effect when p_0 is

greater than $\frac{1-k}{\delta}$. It shows that when corporate reputation is very low, the controlling

shareholder will conduct embezzlement instead of building a reputation. p_0 is prior probability of external investor consideration that the controlling shareholder has high quality and it shows the accumulated reputation of controlling shareholder. Greater the p_0 is, more likely it is balanced equilibrium under the conditions of $p_0 \geq \frac{1-k}{\delta}$.

Otherwise, the smaller value of p_0 shows that the balanced equilibrium is in the conditions of $p_0 < \frac{1-k}{\delta}$. This suggests that reputation of controlling shareholder can constrain their behavior of embezzlement.

In general, constraint function divides the reputation acts of controlling shareholder into two aspects. On the one hand, the enterprise reputation will restrict the controlling shareholders behavior of embezzlement.

When the enterprise has a high reputation, this information is passed to the controlling shareholders through the capital market and the debt market. The controlling shareholders know that the behavior of embezzlement will lead them to heavy cost so they do not choose. It reflects the constraint functions of enterprise reputation.

On the other hand, the better the reputation of the controlling shareholder is, higher its transmission is to external investors through the external market, which is considered to be of high quality, which leads to higher priori probability of controlling shareholder. This reduction is reputation of controlling shareholder generate utility loss. Therefore, the interests of the controlling shareholder will not be invaded, but will pay more attention to maintain their reputation. It can be seen that transmission mechanism of the reputation is a bidirectional. External Information can be transmitted to the internal people through the capital market reputation and the reputation of debt market. While corporate governance is also reflected in the external market through reputation.

Under the following conditions we can establish the binding effects of reputation: 1) Participants repeated game. 2) Signals of reputation transfer effectively. 3) Effective punishment and excitation of reputation.

4. EMPIRICAL STUDY

(1) Research Hypothesis

However, it was only the result of theoretically analyzed mechanism and mathematical analysis of the above discussion; there is no inspection of listed companies in China's capital markets. Although the game theory is mathematical analysis, but there are some gaps among design assumptions and the game process and reality. Reputation that plays an important role also requires certain conditions, which in our country may not be able to meet the overall market environment. Therefore, we can test these analytically drawn constraint mechanisms through data. For this we can develop the following hypothesis:

H_1 : There is a negative correlation among corporate reputation and the encroachment of the controlling shareholder, the better the reputation, the lower the degree of occupation of the controlling shareholder.

H_2 : There is a negative correlation between reputation and its occupation of the controlling shareholder, the controlling shareholder prior to the accumulation of reputation that leads to the lower level of their occupation.

(2) Selection of variables and establishment of model

First, we measure the degree of embezzlement. Funds utilization means of controlling shareholders are very common and widespread in listed companies of China. According to the financial statements of 2012, embezzlement of funds from the controlling shareholders of all listed companies is at very serious stage, which has reached about 40 billion RMB.

Previous studies have also indicated the huge losses to the stakeholders of listed companies accounting for money due to encroachment of the controlling shareholder. Thus, the combined effect produced by companies of all sizes, the ratio of the controlling shareholder and the final total net assets of funds used to measure the rate as the controlling shareholder of the extent of encroachment.

Secondly we measure the reputation of enterprises. Based on the theoretical analysis, the assessment of different object and the reputation of that outside investors in different markets including capital markets reputation and the reputation of the debt are discussed separately. The capital market reputation is measured through book value. Based on the debt market participants, Debt market reputation can be divided into three areas namely evaluation, evaluation-related businesses and bond buying evaluation of commercial banks. However, due to the development of China's corporate bond market in its infancy, this article does not evaluate the corporate bond buyers as the debt market reputation evaluation. We use of bank lending rates in terms of long-term loans and short-term borrowings and total assets of commercial banks measure and commercial credit rate as amount, noting that the amount of business from the customer to evaluate progress over the total amount of income and business-related measurements.

Thirdly we measure the reputation of the controlling shareholder. Starting from the definition of reputation research, we use financial indicators to measure the reputation. According to evaluators the reputation of the controlling shareholder is a comprehensive evaluation of their historical behavior. Due to the complexity in reputation formulation, controlling shareholder's reputation is very difficult to measure. In this paper we use the perspective of controlling shareholder behavior and average of historical net support rate (the opposite of funds net occupancy) to measure the reputation.

Finally, we select the control variables that include the following four aspects: (1) Company size (logarithmic) (2) Return on equity (3) Equity restriction (4) Industry factors. Measurement of reputation and the embezzlement of controlling shareholder are two objectives of the current study. According to the above discussion, two assumptions are developed, first, a constraint reputation is reflected in both reputation of the controlling shareholder and second, corporate reputation. Thus, the multivariate regression models are established on the basis of these two assumptions. Both models are shown in following formulas (model 1 in formula (4-1) and model 2 in formula (4-2).

$$Y = \alpha + \beta_1 BL + \beta_2 CC + \beta_3 PB + \gamma_1 Size + \gamma_2 Roa + \gamma_3 Share + \gamma_4 Ind + \varepsilon \quad (4-1)$$

$$Y = \alpha + \beta X + \gamma_1 Size + \gamma_2 Roa + \gamma_3 Share + \gamma_4 Ind + \varepsilon \quad (4-2)$$

Y — The occupation degree of controlling shareholder

PB — Price-to-Book Ratio

BL — Interest rate on bank borrowings

CC — rate on commercial Credit

X — The reputation of controlling shareholder

Size — Size of company

Roa — Return on Assets

Share — Equity restriction

Ind — Industry

α is constant term, β 、 β_1 、 β_2 、 β_3 、 γ_1 、 γ_2 、 γ_3 、 γ_4 are regression coefficients, ϵ is random error.

(3)Regression Results

Current study selects the listed companies as a sample that have “A” category shares before 2008 that are controlled by the controlling shareholder. After screening we identify 637 listed companies in 2008-2012 as sample and year 2012 data was used to test the model 2.

The regression results of model 1 are as follows:

Table1: Regression coefficients of model 1

Variables	Coefficients	T	Sig.
PB	-.029	1.520	.129
BL	.626	29.179	.000
CC	-.114	-6.183	.000
Size	-.071	-4.295	.000
ROA	-.633	-27.711	.000
Share	.040	2.661	.008
Ind		Control	

Adjusted R-squared = 0.448, F = 122.542

We use SPSS for regression analysis, results are shown in Table-1, According to the results extent of encroachment between price/book ratio and the occupation degree of the controlling shareholder has non-significant negative correlation. So the corporate reputation in the China's listed companies hasn't have constraints function on embezzlement behavior of controlling shareholder. This shows that China's stock market is still not mature enough which has lack of efficient transmission of information, and could not be directly linked to the stock price and the company operating results, so the punitive action of reputation couldn't be well represented.

The bank borrowing rate and the occupation degree of controlling shareholder show a significant positive correlation. China's bank borrowing rate of listed companies could not limit embezzlement behavior of controlling shareholder, where the higher bank borrowing rate have a higher degree of occupation of the controlling shareholder. Generally China's commercial banks and enterprises have long-term cooperative relationship.

When banks evaluate enterprises, they generally consider the enterprises' viability and profitability while recovery of funds and their motivation in participation of corporate governance deficiency. Therefore, the bank could not play the constraint role in enterprises reputation when bound reputation act as an evaluation body. There is a negative correlation between commercial credit rate and the embezzlement of the controlling shareholder, at 10% significance level, with regression coefficient -0.114. In a market with growing emphasis on the integrity, the increasing scale of the commercial credit had a very significant impact on the development of enterprises. Once the occurrence of embezzlement appeared, its commercial credit rating and enterprise reputation rating would decrease, which affects not only the enterprise debt-scale, but also affects the future operating state of the business. So at this situation, occupation costs will be enormous. Therefore, the debt market reputation and embezzlement have binding effect on the controlling shareholder, especially on commercial credit.

Overall, the empirical results show that the constraint function of enterprises' reputation on embezzlement behavior of controlling shareholder is not much strong, that reject our first hypothesis H_1 . The poor market information transfer efficiency of China's capital market and the low punishment level of capital markets and debt markets are the basic reasons of it.

The regression results of model 2 are as following:

Table 2: Regression coefficients of model 2

Variables	Coefficients	T	Sig.
X	-.747	28.782	.000
Share	.040	1.669	.096
Size	-.013	2.068	.039
ROA	-.113	-4.119	.000
Ind		Control	

Adjusted R-squared =0.652,F=75.531

As can be seen from the results of the regression model 2 (table-), that there is a negative correlation between the reputation of controlling shareholder and their degree of embezzlement and its regression coefficient (-0.747) is significant at 1% level of significance. Companies should be more motivated in maintain their reputation for effectiveness, then controlling shareholder reputation that lower down the occupation degree of the controlling shareholder.

As discussed above that the information transfer efficiency is not high and the punishment is also not enough, so the role of corporate reputation could not take place. The role of the controlling shareholder's reputation did not need punishment mechanism but they need their utility incentives, so controlling shareholder can still bound the embezzlement behavior. Therefore, our second hypothesis H_2 is accepted.

We can conclude that the reputation of controlling shareholder has a binding effect on its embezzlement but its influence on corporate reputation constraint is not strong. Improvements in the listed companies of China are required in the protagonist of reputation mechanism.

5. CONCLUSION

The reputation constraints function of the controlling shareholder's embezzlement behavior reflects in two aspects, reputation of controlling and reputation of enterprises. Through game theory we found that the reputation of controlling shareholder and reputation of enterprises have constraints function with the controlling shareholder's embezzlement behavior. When reputation is high, this information is passed to the controlling shareholder through the capital and debt markets. Controlling shareholder knows that the embezzlement behavior will bring huge embezzlement cost, so they would not choose to take embezzlement action. The better reputation for controlling shareholders increases the prior probability that they are considered to be high grade controlling shareholders. Giving up this reputation will decrease their utility, so it is possible that they will not choose embezzlement action.

The reputation mechanism is one of the three conditions of repeated games, the effective reputation signal transmission and effective punishment mechanism could have constraints function. In repeated games, future earnings and current earnings need to be weighed, so reputation could work; while the role of incentives and penalties must be achieved based on the effective transmission of the reputation signals. Constraints function is mainly reflect the punishment in negative reputation and incentive in positive reputation, so the perfect punishment mechanism could make reputation function more effective.

In Chinese listed companies, the constraints function of reputation for embezzlement behavior of controlling shareholders reflects the constraints function of their reputation. However, the reputation of enterprises is not well reflected. Empirical studies have found that there is no significantly positive correlation available between the book value and encroachment of controlling shareholder. The role of capital market in constraints reputation does not reflect a significant negative correlation between commercial credit rate and the degree of occupation of the controlling shareholder. There is a significant positive correlation available among bank borrowing and the occupation degree of controlling shareholder but a healthy debt markets did not reflect that this relationship exist because of inadequate punishment mechanisms and insufficient information transmission efficiency.

Reputation of controlling shareholders and extent of their embezzlement are significantly negatively correlated, which shows that the accumulation of prior reputation has constraints function with the embezzlement behavior of controlling shareholders.

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