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How Much Control Causes Tunneling? Evidence from China

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How Much Control Causes Tunneling? Evidence from China

ABSTRACT

We study the dynamic causal effects of the controlled shareholding ratio on tunneling behavior in China. We use control-right-transfer as the event to conduct the study. We obtain 456 control-rights-transfer samples and 1,368 firm-year observations from 2000 to 2010. We make the following findings. First, tunneling behavior is significantly affected by the controlled shareholding ratio. Second, this relationship takes a cubic shape. There are at least two turning points. Firms with controlling shareholding ratios that range from 25% to 30% (36% to 48%) exhibit the most (least) severe tunneling. Furthermore, we divide the sample into Bad Transfers and Good Transfers based on market performance during a control-rights-transfer event. We find that the cubic relationship for target firms in Bad Transfers presents an N shape when depicted graphically. However, it presents an inverted-N shape for Good Transfers. When the controlled shareholding ratio is low (high), target firms in Bad Transfers exhibit more (less) severe tunneling behavior than Good Transfers.

Keywords: Tunneling; Shareholding ratio; Market for corporate control; Agency theory

JEL Classification G34, G32, G38

Introduction

Ever since the tunneling behavior of controlling shareholders was first identified, it has been studied extensively. Companies with concentrated ownership structures[3] typically have one controlling shareholder.[4] Controlling shareholders can access benefits by either creating or transferring a company's wealth. When creating wealth, controlling shareholders derive benefits from the general value enhancement that results from improved management, which is known as the alignment (incentive) effect. Conversely, when engaging in wealth transfers, controlling shareholders obtain private benefits by expropriating minority shareholder benefits, which is also known as the tunneling (entrenchment) effect (Shleifer and Vishny, 1986; Johnson *et al.,* 2000). It is generally believed that ownership structure affects controlling shareholders' tunneling and alignment decisions and that in turn, tunneling behavior affects firm value.

Most of the research on this topic examines the relationship between ownership structure and firm value, with the assumption that ownership structure (particularly with respect to the difference between control rights and cash-flow rights) affects the controlled tunneling behavior, which affects firm value. The general findings in this direction support the inverted U-shaped (or concave) relationship between ownership structure and firm value (Morck, Shleifer and Vishny, 1988; Stulz, 1988; McConnell and Servaes, 1990). In addition, some

[3] Over the past decade, studies have shown that corporate ownership structures are concentrated rather than dispersed in most countries, particularly those with weak investor protections (La *et al.* 1998, 1999).

[4] The controlling shareholder is either the shareholder that controls the company and owns 50% or more equity or the shareholder that owns less than 50% equity but dominates the company's daily operations and decision-making and uses the company's property by virtue of his superior position.

research finds that a disparity between control rights and cash-flow rights triggers tunneling activity, which decreases firm value (Lins, 2003; Claessens *et al.*, 2002).

Subsequent studies have investigated the relationship between tunneling and firm value and have arrived at results that are consistent with the conclusions discussed above. Tunneling activity and firm value are negatively correlated, and more severe tunneling activity leads to lower firm value (Jiang *et al.*, 2010).

Thus far, no studies have examined the direct relationship between the controlled shareholding ratio and tunneling. Although previous studies assume that certain ownership structures will trigger tunneling and eventually affect firm value, none of the previous research directly examines how the controlled shareholding ratio affects tunneling. The theoretical models of Johnson *et al*. (2000) and LLSV (2002) imply that controlling shareholders' equity holdings affect their tunneling behavior, but there is no empirical evidence to support this theoretical conjecture.

In this paper, we aim to offer a comprehensive study of the causal effects of the controlled shareholding ratio on tunneling behavior in China; our primary purpose is to study the direct relationship between the controlled shareholding ratio and tunneling activity. We use control-rights-transfer events to study the research question in the China market from 2000 to 2010. Theoretically, we modify and extend the theoretical models of Johnson *et al.* (2000) and LLSV (2002); we then differentiate control-rights-transfer events into two scenarios (Good Transfers and Bad Transfers), and we explicitly study the direct relationship between the controlled shareholding ratio and tunneling. We then offer empirical findings and analysis to verify our theoretical conjectures.

Our primary findings are as follows: (1) tunneling activities are likely to be a consequence of the controlled shareholding ratio, whereas the controlled shareholding ratio is not significantly impacted by tunneling activities; (2) the relationships between tunneling activities and the controlled shareholding ratio are different for target firms in Good Transfers than Bad Transfers; (3) in addition to being linear or tortuous, the relationship between tunneling activities and the controlled shareholding ratio may be cubic; (4) for Bad Transfers, the relationship between the two variables presents an "incline-decline-incline" trend or an N-shaped relationship; (5) for Good Transfers, the relationship between the two variables presents a "decline-incline-decline" trend or an inverse N-shaped relationship; (6) firms with controlling-shareholder shareholding ratios in the 25%-30% range have the most severe tunneling activities, whereas firms with controlling-shareholder shareholding ratios in the 36%-48% range have the least severe tunneling activities; and (7) when the controlled shareholding ratio is low, target firms in Bad Transfers have more severe tunneling than Good Transfers, and when the controlled shareholding ratio is high, Bad Transfers have significantly less tunneling than their Good Transfers counterparts.

We make five major contributions to the literature. First, we provide direct evidence of the relationship between the controlled shareholding ratio and tunneling behavior. Second, we construct a theoretical model to depict the cubic relationship between the two variables. Third, we design a set of quadratic regression models both to capture the relationship between the two variables and to test our theoretical conjecture. Fourth, we complement the current literature by conducting the study using two subsamples (Good Transfers and Bad Transfers), and we find that the relationship between the two variables presents significantly different trends in the two subsamples. Finally, we find that there are two turning points of the controlled shareholding ratio that trigger more severe or less severe tunneling activities.

The remainder of the paper is structured as follows. Section I reviews the current literature, and Section II introduces the institutional background and data. Section III presents the theoretical model and the hypotheses. In section IV, we design a set of regression models to test the theoretical conjecture and the hypotheses. Section V contains the robustness test, and Section VI concludes the paper.

Literature Review

Morck, Shleifer and Vishny (1988) first define the "entrenchment effect" as a decrease in the value of corporate assets when managed by a manager with high levels of control rights and low levels of cash-flow rights. La Porta *et al.* (2000) find that Czech markets have been plagued by massive expropriation from minority shareholders and introduce the concept of "tunneling" to describe the appropriation of assets from both firms and mutual funds by controlling shareholders. More specifically, La Porta *et al.* (2002) define "tunneling" as the activity of controlling shareholders who divert firm profits to themselves before distributing the remainder as dividends. Such diversion or tunneling can take the form of salaries, transfer pricing, subsidized personal loans, non-arm's-length asset transactions and even outright theft. Researchers (La Porta *et al.*, 2000; Johnson *et al.*, 2000; La Porta *et al.*, 2002) generally refer to tunneling activity as a situation in which controlling shareholders transfer a company's property or profits counter to the interests of minority shareholders by virtue of their superior control positions. We adopt this latter definition.

The literature focuses on the relationship between the structure of ownership control and firm value (La Porta *et al.,* 2000; La Porta *et al.,* 2002; Claessens *et al.*, 2002; Lemmon and Lins, 2003; Offenberg, 2009; Jiang et al., 2010). Claessens *et al.* (2002) find that firm value increases when the controlling shareholder has commensurate cash flow ownership, which is, of course, consistent with a positive incentive effect. However, firm value decreases when the control rights of the controlling shareholder exceed its cash-flow ownership, which is consistent with the tunneling effect. Faccio and Lang (2002) and Lins (2003) report similar findings. Chan *et al.* (2003) suggest a non-linear relationship between the cash-flow ownership of the controlling shareholder and firm value. Morck et al. (1988) presents an inverted U-shaped (Claessens *et al.*, 2002) relationship between managerial control rights and firm value. Stulz (1988) depicts a concave relationship between managerial control rights and firm value, and McConnell and Servaes (1990) provide empirical support for such a concave relationship. Shleifer and Vishny (1997) suggest that when managerial control rights exceed a certain level, the controlling shareholders prefer to gain private benefits through tunneling;

their findings also support the inverted U-shaped relationship between a controlling shareholder's control right and firm value. The general findings on this topic are consistent with the inverted U-shaped or concave relationship between the managerial control right and firm value, which implies that a managerial control right is positively related to firm value before reaching a certain level, at which it becomes negative and tunneling begins. As discussed above, most current studies focus on the effects of a managerial control rights on firm value instead of the effects of the controlled shareholding ratio on tunneling behavior.

Indeed, few studies directly examine the relationship between the controlled shareholding ratio and tunneling. It is generally believed that the relationship between tunneling and the controlled shareholding ratio is not stable and may be affected either by time or by company operations (Xi and Yu, 2006; Bai and Wu, 2008). Johnson *et al.* (2000) deduce a theoretical model with implications for a concave relationship between the controlled shareholding ratio and tunneling behavior; however, there is no empirical evidence to support this theoretical conjecture. In this paper, we consider transfers of control rights involving public Chinese companies as events and then study how a highly concentrated ownership structure and tunneling behavior influence one another.

We choose to use transfers of control rights through equity transfer agreements as our key events because when control rights are transferred, controlling shareholders will carefully reselect the shareholding ratio to maximize their private benefit (La Porta *et al.*, 2002). The current controlling shareholder transfers control rights to the bidder that offers the largest “bribe” (including possibly illegal actions) instead of to the bidder with the greatest ability to maximize performance (Bayne, 1963; Jennings, 1956). Thus, the controlling shareholder's behavior would lead to unsuccessful acquisitions because of the controlling shareholder's greed in attempting to maximize private benefits when transferring control rights (Kahan, 1993; Bebchuk, 1994). Bae *et al.* (2002) show that controlling shareholder blocs’ acquisition prices are established to enhance those blocs’ value to other firms, to the detriment of minority shareholders. Prior studies also show that controlling shareholders’ incentives to obtain the private benefits of control are closely related to the proportion of ownership held during the period of a control rights transfer and therefore, they have a significant influence on firm value after that transfer (La Porta *et al.*, 2002; Bayne, 1963; Jennings, 1956; Kahan, 1993; Bebchuk, 1994). Thus, the transfer of control rights is a major event through which controlling shareholders can pursue tunneling.

In order to thoroughly explore the relationship between control-rights transfers quality (diminish the value or not), the full sample is subdivided into groups of Good Transfers and Bad Transfers. We analyze the direct relationships between the equity holdings of controlling shareholders and tunneling activities within the two groups. Bad Transfers refer to control-rights transfers that destroy the value of companies and small shareholders, whereas Good Transfers refer to the same types of transactions that nevertheless enhance the value of companies. The reason why we need two sub-groups is that some controlling shareholders’ behavior will lead to unsuccessful transactions because of their greed in grabbing private benefits during the transfer of control rights (Bayne, 1963; Jennings, 1956; Kahan, 1993; Bebchuk, 1994; La Porta *et al.*, 2002); thus, for some firms, severe tunneling will lead to a decline in firm value following the transfer of control rights. The ownership structure chosen by controlling shareholders before and after a control-rights transfer will affect those shareholders' tunneling behavior; therefore, to provide a comprehensive picture of the relationship between the controlled shareholding ratio and tunneling, we should conduct a study of two sub-groups: Good Transfers and Bad Transfers.

Institutional Background and Data

Institutional background

As an emerging financial market, China has highly concentrated firm ownership and lacks a comprehensive legal system to protect the interests of minority investors (Jiang *et al.* (2010)). More specifically, regulators in China have a long tradition of protecting state interests and little experience with litigation driven by private plaintiffs (Allen *et al.*, 2005; MacNeil, 2002). As a rapidly developing transitional economy, China is an excellent laboratory in which to study the direct relationships between the controlling shareholders' tunneling behavior and firm value.

(Insert Table Ⅰ here.)

A special feature of China's corporate control market consists of state-owned enterprises (SOEs). Green (2003) reports that the Chinese stock market was organized by the government as a vehicle for SOEs to raise capital and improve their operating performance. To make this vehicle effective, the state aimed to retain sufficient equity interests to control public firms. Thus, the ownership of public Chinese companies is heavily concentrated in the hands of the state. As shown in Table I, from 2000 to 2010, the ownership structure of public companies changed from 81.89% state-owned shares, 13.87% legal person shares and 4.25% private shares to 59.90% state-owned shares, 22.07% legal person shares and 18.03% private shares. The percentage of shares owned by the state and by legal persons is decreasing, but it still accounts for a significant share (more than 80%) of the ownership structure.

(Insert Table Ⅱ here.)

Table 2 shows the development of China's corporate control market from 1998 to 2010; during that period, China's corporate control market grew rapidly. From 2000 to 2010, the number of acquisitions increased from zero to 452, with the highest numbers (732 and 924) posted in 2006 and 2007, respectively. The number of transfers of corporate control increased from zero to 237, with the highest number (302) in 2007. In addition, in July 2005, the Chinese government announced a policy to convert non-tradable shares[5] into tradable shares. This "Share Segregation Reform" policy aimed to achieve a balance among the interests of non-tradable shareholders and tradable shareholders through a consultative mechanism and therefore to eliminate differences in the share transfer system in the A-share market. Generally, non-tradable shareholders of listed companies had to pay a certain consideration

[5] Non-tradable shares refer to block shares (state-owned shares and legal person shares) that could not be traded in the market before 2005 (Jiang *et al.* (2010)).

(compensation) to holders of tradable shares (typically minority shareholders) to secure the liquidity rights of their share blocs. As of October 30, 2006, the capitalization of reformed companies comprised more than 94% of the total Shanghai and Shenzhen stock markets. The policy had been completely implemented by the end of 2007. Thus, the market began to bloom in 2005 and reached its zenith in 2007.

In China, tunneling by controlling shareholders is commonly observed (Tang *et al.*, 2002; Li *et al.*, 2004; Wang *et al.*, 2004). Unlike most developed markets, China's controlling-shareholder activity is much more consistent with the tunneling effect than with the alignment effect because of China's immature market for corporate control and its imperfect legal system and because the ownership structures of public Chinese companies are heavily concentrated in the hands of the state (70% on average) (Green, 2003), as discussed above. Thus, the influence of a highly concentrated ownership structure on tunneling behavior is an important topic to investigate both to improve the level of investor protection and to develop an appropriate regulatory framework.

We adopt the methodology of Liu and Lu (2007) and Jiang *et al.* (2010) who use other receivables over total assets (ORECTA) as a measure of tunneling activity. We discuss the reasons for the choice of this methodology below.

First, Liu and Lu (2007) indicate that tunneling behavior in China primarily occurs in the form of loans from controlled companies to majority shareholders, in addition to other types of related-party transactions. According to Jiang *et al.* (2010), controlling shareholders used inter-corporate loans to siphon billions of RMB from hundreds of Chinese public companies during the 1996-2006 period, and a substantial portion of these loans (between 30% and 40% of total OREC[6] in the top three deciles) were made for the benefit of controlling shareholders and/or their affiliates. Thus, inter-corporate lending is a major method of tunneling. Peng *et al.* (2011) also find that related-party transactions were used to effect tunneling activities in China from 1998 to 2004. Tu and Yu (2015) also use OREC to capture potential tunneling behaviors, and find that tunneling behaviors declined when the State both issued regulations against tunneling and strengthened enforcement.

Second, Liu and Lu (2007) find that the controlling shareholders of 130 firms owe their listed companies an average of US$ 40 million in the form of account receivables or parent borrowing from subsidiaries. Most of the "other receivables" of Chinese listed firms are corporate loans to related companies (Jiang *et al.*, 2010).

Third, ORECTA is a measure of inter-corporate loans, which are in turn a good measure of tunneling activity in China. Higher ORECTA values indicate more severe tunneling activities (Jiang *et al.*, 2010).

Thus, considering both prior research and China's corporate control market, we use ORECTA to measure the severity of tunneling.

As noted previously, over the past decade, tunneling has been commonly observed in

[6] In their study, Jiang *et al.* (2010) indicate that tens of billions in renminbi (RMB) have been siphoned from hundreds of Chinese firms by controlling shareholders. Typically reported as part of "other receivables" (OREC), these loans are found on the balance sheets of a majority of Chinese firms and collectively represent a large portion of the assets and market values of such firms. This situation has been referred to as the OREC problem.

China. Table 3 shows public Chinese companies' tunneling activities from 2000 to 2010.

(Insert Table Ⅲ here.)

Tunneling activities were widespread from 2000 to 2006; the highest ORECTA value reached 0.113 in 2006, which was followed by a sharp decrease. In 2007, the China Securities Regulatory Commission amended the "Administration of the Takeover of Listed Companies Procedures" and revised the regulation of public company acquisition according to its newly revised "Securities Law" to improve the efficiency of the country's capital markets. In 2010, the ORECTA value decreased to 0.023, which indicates that tunneling activity has been regulated more effectively since 2007.

In another study, Gao and Kling (2008) analyze the tunneling data for public Chinese firms from 1998 to 2002 and find that improvements in corporate governance have prevented operational tunneling. However, Li (2010) studies the tunneling effect from 2002 to 2007 and finds that privately controlled public companies engage in more tunneling despite having better corporate governance.

Data description and preliminary analysis

We select sample companies that have had control rights transferred through equity transfer agreements from January 2001 to December 2010. We search for the name and ownership of each of the top ten shareholders disclosed in the CSMAR Database. Next, we collected the financial data and corporate governance data obtained from the CSMAR Database, including "The Mergers and Acquisitions of Public Companies in China Database," "China's Corporate Governance Structure Database" and "Shareholders of China's Public Companies Research Database". Stata 10.0 software is used as for processing the data.

Our data selection criteria are as follows:

(1) We select public companies that witnessed their controlling shareholder change during the sample period.

(2) For companies that were the subject of two or more control rights transfers in a three-year period, we select only the last event as a sample event to exclude the stack effect.

(3) To avoid a situation in which the company's actual controlling shareholder did not change, we eliminate companies in which control-rights transfers occurred between a parent company and either a subsidiary company or an affiliated (sister) company.

(4) We eliminate financial companies from our analysis.

(5) We eliminate companies for whom the transactions have not been completed or were terminated.

(6) We eliminate companies that had transactions that were free of charge.

(7) We eliminate companies that have individual data missing and/or that have abnormal extremes.

We obtain 456 control-rights-transfer samples and 1,368 firm-year observations during the study period.

Table 4 reports descriptive statistics for the sample companies in the sample period.

(Insert Table IV here.)

Table IV shows that public companies with control transfers had an average non-negative cumulative abnormal return ("CAR") of 0.0260, which indicates that on average, the reaction of the market to control transfers was positive during the sample period. The mean ORECTA value is 0.0713, which indicates that the firms in the sample have an average tunneling activity value of 0.0713. Compared to the ORECTA value of 0.081 from Jiang *et al.* (2010), our sample has a slightly lower value (Jiang *et al.*'s (2010) sample period spanned from 1996 to 2004).

The average controlled shareholding ratio (HLD) is approximately 0.3433, and the average board size is greater than 9. The average return on assets (ROA) is 0.0394. The average debt ratio is 0.54. The average firm size is 21.1631.

It is notable that most firms have substantial ORECTA on their balance sheets. The average ORECTA value is 0.0713, and the interquartile range is between 0.017 and 0.108 of total assets, which indicates that our sample firms exhibited noticeable tunneling activity during the sample period.

Sub-sample descriptions – Good Transfers and Bad Transfers

According to Mitchell and Lehn (1990) and Offenberg (2009), Good Bidders are defined as those in which the compound CAR to the acquirer is nonnegative. Similarly, Bad Bidders are defined as those in which the compound CAR is negative.

Following Mitchell and Lehn (1990), we define target firms[7] with positive CARs as Good Transfers and those with negative CARs as Bad Transfers. CAR is calculated as the sum of the pre-announcement run-up and the post-announcement increase in the target's stock price.

Mitchell and Lehn (1990) define bad bidders as firms that experience a decrease in shareholder wealth as a result of their acquisition based on their computations of CAR over four windows of time ([-1,1], [-5,1], [-5,40] and [-20,40]). Like Mitchell and Lehn (1990), Offenberg (2009) uses short-term CAR to measure good and bad bidders; Offenberg (2009) defines good bidders as firms with non-negative CARs and bad bidders as firms with negative CARs over the period of [-5, 2] surrounding the acquisition event. By contrast, Schwert (1996) uses a longer period to compute CAR (-42, 126) and finds that CARs begin to rise near day -42 (approximately two months before the first bid announcement)—with the largest pre-bid rise occurring from days -21 to day -1—and that the CARs for the entire sample are flat for the first 126 trading days (approximately six months) after the announcement date.

Considering the literature on the efficiency of the Chinese stock market, we consider buy-and-hold CAR (BHCAR) to be more suitable for capturing the entire corresponding premium caused by a large event. Thus, we follow the approach of Schwert (1996) and

[7] Most of the data about acquirers in our control-rights transfers samples are not available in the CSMAR Database and the other Chinese financial database. And our research focus on the corporate value of the targets after control-rights transfer are diminished or not.

calculate the BHCARs for the longer period (-42, 126).

Based on the CAR values that we compute[8], we obtain 703 Good Transfers samples and 623 Bad Transfers samples. We match Good Transfers and Bad Transfers by firm year, industry and size. We eventually obtain 241 Good Transfers samples and 215 Bad Transfers samples in the matched groups. Table Ⅴ-a presents the summary statistics for the control variables of the two samples.

(Insert Table Ⅴ-a here.)

As Table Ⅴ-a shows, the matched Good Transfers and Bad Transfers samples in each industry have similar market capitalizations.

Table Ⅴ-b reports the descriptive statistics for the main variables of Good Transfers and Bad Transfers samples during three periods. Period T is the year of the control rights transfer, period T-1 is the year before the control rights transfer and T+1 is the year after the control rights transfer.

(Insert Table Ⅴ-b here.)

Table Ⅴ-b shows the changes in tunneling activities (ORECTA), the shareholding ratio of the controlling shareholder (HLD) and firm performance (ROA) for the full sample, Bad Transfers group and Good Transfers group over the three periods.

On average, ORECTA significantly decreases from 0.07 to 0.06. The trends in Bad Transfers and Good Transfers samples are consistent. The value of ORECTA is

[8] We have computed 1,326 CARs.

significantly higher in Bad Transfers sample during time T, which indicates that target firms in Bad Transfers experienced significant more sever tunneling during the control rights transfers, compare to Good Transfers.

HLD decreases from 36 percent to 33 percent after control transfers. The trend is similar for Good Transfers and Bad Transfers samples, and there is no significant difference between Good Transfers and Bad Transfers. Although the controlling shareholders shareholding ratio did not change much, the controlling shareholders have changed after the control transfer events.

ROA is found to be significantly higher for target firms in Bad Transfers than for Good Transfers for the three periods. The ROA for target firms in Bad Transfers significantly decrease after control right transfer, while the ROA for Good Transfers did not change much before, during and after the control right transfer. These results show that the firms with better performance have higher chance to be target firms in Bad Transfers and experience severer tunneling, and tunneling significantly reduce firm operational performance.

These results indicate as follows. First, and consistent with previous findings, tunneling activity significantly reduces firm operational performance. Second, the controlling shareholders of target firms in Good Transfers have less incentive to tunnel and that stock market performance (as reflected in CAR) is negatively related to tunneling activity, whereas operational performance is positively related to tunneling.

To examine the dynamic relationship between the controlled shareholding ratio and tunneling behavior, we divide the sample into 10 deciles based on the controlled shareholding ratio during the pre-event period (T-1), and we compute ORECTA at time T (the event year). The results are reported in Table VI.

(Insert Table VI here.)

Table VI reports the ORECTA values of the 10 controlled shareholding deciles for the full, Bad Transfers and Good Transfers samples. The results show the following.

First, deciles 4 and 5 have the highest ORECTA values, whereas deciles 7 and 8 have the lowest ORECTA values, which indicate that firms with controlled shareholding ratios in the 25%-30% range have the most severe tunneling activity, whereas firms in the 36%-48% range have the least tunneling activity. Second, the ORECTA value of Bad Transfers sample is significantly higher than that of Good Transfers sample for deciles 2 to 6 but is significantly lower than Good Transfers sample for deciles 7 and 9. The two samples exhibit no significant differences in the other holding deciles. These findings imply that when the controlled shareholding ratio is low, tunneling is more severe for target firms in Bad Transfers. When the controlled shareholding ratio is higher, Good Transfers tend to have more tunneling. Tunneling increase first and then decreases as the controlled shareholding ratio increases until the last decile, at which point tunneling increases again, which clearly indicates that the relationship between the controlled shareholding ratio and tunneling activity is not simply linear.

Prior research reports not only that there is an inverted U-shaped relationship between firm value and the shareholding ratio of the controlling shareholder (Claessenst *et al.*, 2002; Li *et al.*, 2004) but also that the change in firm value is caused by tunneling behavior; however, there is no clear evidence of how tunneling behaviors change with the controlled shareholding ratio. From the above findings, we can infer not only that the controlled shareholding ratio and tunneling activities are not related on a simple linear or tortuous basis but also that there is more than one turning point in the trend. Therefore, we should employ a more comprehensive design to study the effect of the interaction between these two variables.

Theoretical model and hypotheses

Johnson *et al.* (2000) and LLSV (2002) establish a basic theoretical framework for tunneling behavior.

We extend the models of Johnson *et al.* (2000) and LLSV (2002) to control rights transfer events. Specifically, in one extension, we divide the entire sample into two sub-sets—Good Transfers and Bad Transfers—and study the direct relationship between the two variables in these two sub-samples. We consider this extension to be one of the contributions of this study.

Assumptions:

(1) The controlling shareholder owns share α of the firm, and outsiders own share $(1-\alpha)$.

(2) The total assets of the target firm are denoted by *TA*, and the CARs related to the control transfer are denoted by *R*.

(3) The controlling shareholder usurps *s* of the total assets (*TA)* of the target in the control

transfer.

(4) The cost of tunneling (usurping s) is $c(k,s) = \frac{1}{2k}s^2$, and a higher value of k represents either weaker corporate governance regulation, a weaker legal system or both (i.e., it is less costly to usurp assets from the target).

(5) The cost of tunneling is greater than zero but less than the total stealing amount to trigger tunneling; that is, $0 < \frac{1}{2k}s^2 \leq s$, which implies that $0 < \frac{1}{k}s \leq 2$.

The controlled optimization problem may be written as follows:

$$\text{MaxU}(\text{s};\text{R},\text{k},\alpha) = \text{Max}[\alpha\text{R}(\text{TA}-\text{s}) + \text{s} - \frac{1}{2\text{k}}\text{s}^2] \quad (1)$$

Differentiating Equation 1 with respect to α yields the following:

$$\frac{\partial s}{\partial \alpha} = \frac{RS - R*TA}{1-\alpha R - \frac{s}{k}} \quad (2)$$

When the CARs of a control transfer are less than zero (R<0), we define these types of control transfers as Bad Transfers[9]. We thus obtain the following:

$$(Rs - R*TA) > 0 \; because \; s < TA \text{ and } R < 0$$

Because $0 < \frac{1}{k}s \leq 2$ (Assumption (5)),

when α is small, we obtain the following:

$\left(1 - \alpha\text{R} - \frac{s}{k}\right) > 0$, which yields $\frac{\partial s}{\partial \alpha} > 0$;

when α is large, we obtain the following:

$\left(1 - \alpha\text{R} - \frac{s}{k}\right) \leq 0$, which yields $\frac{\partial s}{\partial \alpha} \leq 0$.

Therefore, our first hypothesis is as follows:

[9] We define target firms with CARs>0 as "good" bids and those with CARs<0 as "bad" bids in the sample descriptions.

H1. The relationship between tunneling and the shareholding ratio exhibits an "incline-decline" trend for Bad Transfers, which resembles an inverted-U shape graphically (see Figure Ⅰ-a).

When the CARs of control transfers are greater than zero (*R*>0), we define these types of control transfers as Good Transfers. We obtain the following:

$(Rs - R * TA) < 0$ because $s < TA$ and *R*>0

Because $0 < \frac{1}{k} s \leq 2$ (Assumption (5)),

when α is small, 0≤s≤ k, s/k ≤1, we obtain the following:

$\left(1 - \alpha R - \frac{s}{k}\right) > 0$, which yields $\frac{\partial s}{\partial \alpha} < 0$;

when α is large, k<s≤2k, 1<s/k≤2, we obtain the following:

$\left(1 - \alpha R - \frac{s}{k}\right) \leq 0$, which yields $\frac{\partial s}{\partial \alpha} \geq 0$.

Therefore, our second hypothesis is as follows:

H2. The relationship between the tunneling behavior of controlling shareholders and the shareholding ratio exhibits a "decline-incline" trend for Good Transfers, which resembles a U shape graphically (see Figure Ⅰ-b).

(Insert Figure Ⅰ-a and Figure Ⅰ-b here.)

As discussed above, corporate governance laws and mechanisms are underdeveloped in China. If corporate governance rules were more developed, the tunneling behavior of controlling shareholders would be punished or would more likely be punished. The cost of tunneling decreases sharply when controlling shareholders own most of the shares of the target. In this instance, we define the cost of tunneling as follows:

$\frac{(1-\alpha)^{\gamma}}{2k}s^2$, where $0 < \gamma \ll 1, 0 < \alpha < 1$

Equation 2 can be revised as follows:

$$\frac{\partial s}{\partial \alpha} = \frac{RS - R*TA - \frac{\gamma s^2}{2k}(1-\alpha)^{\gamma-1}}{1 - \alpha R - \frac{s}{k}(1-\alpha)^{\gamma}} \tag{3}$$

Because $\gamma \ll 1$, we obtain the following:

$$\frac{\gamma s^2}{2k}(1-\alpha)^{\gamma-1} \approx 0$$

Equation 5 can be written as follows:

$$\frac{\partial s}{\partial \alpha} = \frac{RS - R*TA}{1 - \alpha R - \frac{s}{k}(1-\alpha)^{\gamma}} \tag{4}$$

For the Bad Transfers ($R < 0$),

when $\alpha \to 1$ and $(1-\alpha)^{\gamma} \to 0$,

we obtain $\{1 - \alpha R - \frac{s}{k}(1-\alpha)^{\gamma} \approx 1 - \alpha R > 0\}$,

which implies that Equation 6 is greater than zero, or $\frac{\partial s}{\partial \alpha} > 0$.

Thus, we present another important hypothesis:

H3: Given that controlling shareholders in China control more than 80% of the shares of firms on average, the relationship between the tunneling of controlling shareholders and the shareholding ratio exhibits an "incline-decline-incline" trend for Bad Transfers, which resembles an N-shape graphically (see Figure Ⅱ-a).

(Insert Figure Ⅱ-a here.)

For the Good Transfers ($R > 0$),

when $\alpha \to 1$ and $(1-\alpha)^{\gamma} \to 0$,

we obtain $\{1 - \alpha R - \frac{s}{k}(1-\alpha)^{\gamma} \approx 1 - \alpha R > 0\}$,

which implies that Equation 6 is less than zero, or $\frac{\partial s}{\partial \alpha} < 0$.

Thus, we propose the fourth hypothesis:

H4: Given that controlling shareholders in China control more than 80% of the shares of firms on average, the relationship between the tunneling of controlling shareholders and the shareholding ratio exhibits a "decline-incline-decline" trend for Good Transfers, which resembles an inverted N-shape graphically (see Figure Ⅱ-b).

(Insert Figure Ⅱ-b here.)

Our theoretical conjectures above extend the findings of previous studies and offer a more complete picture of the relationship between the controlled shareholding ratio and tunneling behavior.

To test the validity of our theoretical conjectures, we use control-rights-transfer events of publically listed Chinese companies as the setting in which to empirically test the relationship between the shareholding structure and tunneling activities empirically.

Model Specification and Empirical Results

Factorial analysis of variance (ANOVA) and Granger causality tests

To test the above theoretical conjectures and analyze thoroughly the relationship between the shareholding ratios and the tunneling activities of controlling shareholders, we conduct two empirical tests in this section. First, we conduct a factorial ANOVA. Second, we perform a Granger causality test to test the relationship between these two variables.

a. Factorial ANOVA

To further investigate the relation of ORECTA and HLD, we divide ORECTA and HLD into 10 deciles by sorting the values of these variables from bottom to top. We then utilize the STATA program to conduct a factorial ANOVA.

(Insert Table VII a and VII b here.)

The results of the factorial ANOVA indicate that the controlled shareholding ratio has a significant effect on tunneling activities[10].

b. Granger Causality Tests

To test the robustness of the causal relationship between tunneling activity and the controlled shareholding ratio, we use vector auto-regression (VAR) to estimate the full sample, Bad Transfers group and Good Transfers group[11].

The following conclusions can be drawn from our results. 1. More tunneling in the year of a control-rights transfer leads to even more tunneling following the transfer, and higher controlled shareholding ratios prior to the year of a control rights transfer lead to more tunneling after the rights transfer. However, better firm performance in the year of a rights transfer leads to less tunneling after the rights transfer. 2. More severe tunneling in the year of

[10] More details can be found in **Table Ⅶ-a and Table Ⅶ-b.**

[11] We report the results in **Table Ⅷ**.

a rights transfer leads to lower firm performance. 3. Tunneling and firm performance have no significant effect on the controlled shareholding ratio. Overall, tunneling activity and firm performance negatively affect one another in their interaction, which is consistent with current assumptions in the literature. In addition, changes in the controlled shareholding ratio have a significant positive effect on tunneling.

Next, we use the Granger causality test to analyze the causal relationship among the three variables[12].

(Insert Table IX here.)

Based on Tables Ⅷ and Ⅸ, we can confirm that the controlled shareholding ratio significantly influences tunneling behavior, but tunneling behavior does not have a significant effect on the controlled shareholding ratio. Therefore, in the remainder of the paper, we focus on examining how the controlled shareholding ratio influences tunneling behavior.

B. Multiple regression analysis

The findings above indicate that tunneling activity is significantly affected by the controlled shareholding ratio and that the relationship between tunneling activity and shareholding ratios is not simply linear or tortuous.

We borrow the method of La Porta *et al.* (1998) and construct a multivariate analysis model to examine the dynamic relationship. Jiang *et al.* (2010) and Li *et al.* (2004) indicate that the factors affecting tunneling behavior include the size of a company's board of directors,

[12] The results are reported in Table Ⅸ-a. Table Ⅸ-b and Table Ⅸ-c show the results of the Granger causality tests for the Good Transfers and Bad Transfers samples. The results are consistent with the findings for the full sample

the percentage of independent directors and other corporate governance characteristics. Therefore, we use governance characteristics as control variables to differentiate the effects of a company's governance characteristics on tunneling from other factors.

Based on our preliminary data analysis in Section II and theoretical conjecture in Section III, we design Model 1 to tests the linear relationship.

Model 1：

$$\mathrm{ORECTA} = \alpha_0 + \beta_1\mathrm{HLD} + \beta_2\mathrm{ROA} + \beta_3\mathrm{LEV} + \beta_4\mathrm{Size} + \beta_5\mathrm{Boardsize} + \beta_6\mathrm{Indbsize} + \beta_7\mathrm{Boardhold} + \beta_8\mathrm{Ceoduality} + \beta_9\mathrm{Normal} + \beta_{10}\mathrm{State} + \beta_{11}\mathrm{Mindex} + \beta_i\mathrm{Industry} + \mathrm{year} \quad (5)$$

where:

ORECTA is a measure of the level of tunneling severity of the controlling shareholder;

HLD represents the shareholding ratio of the controlling shareholder;

ROA is return on total assets and measures the overall operational performance of the company;

LEV is the asset-liability ratio and represents the financial risk of the company;

SIZE is the logarithm of the firm’s total assets and indicates firm size;

Boardsize is the size of the board of directors; different board sizes have different balancing capabilities relative to the activity of the controlling shareholder;

Boardhold is the shareholding ratio of the board of directors;

Indbsize represents the ratio of independent directors on the board of directors;

Ceoduality represents whether the posts of general manager and chairman of the board of public companies are held by the same person, where 1 represents the general manager and chairman of the board being the same person and 0 represents the general manager and chairman of the board being separate individuals;

Normal represents whether the public company has a normal trading status, where 1 represents the company with a normal trading status and 0 represents non-normal trading status;

State represents the actual type of the company's controlling shareholder, where 1 represents a state-owned holding and 0 represents a holding that is not state-controlled;

Mindex refers to the area's degree of marketization—which will affect the level of corporate governance—in which we use the market index (1997-2007) created by Fan Gang (2009), with 2008 following the index of 2007; and

Industry is an industry dummy variable, and according to the industry classification standard of the China Securities Regulatory Commission (2001), we set 21 dummy variables (excluding the financial industry, the manufacturing industry classified by the second category, and other industries classified by the main category standard).

Model 1 tests the linear relationship between the two variables that can be inferred from previous studies. If β_1 is significant and negative, the controlled shareholding ratio negatively influences tunneling activity. If β_1 is significant and positive, the controlled shareholding ratio positively affects tunneling activity.

Next, we add the square of the shareholding ratio of the controlling shareholder (HLD^2) to Model 1 for testing the tortuous relationship. It is our second model.

Model 2：

$$\text{ORECTA} = \alpha_0 + \beta_1\text{HLD} + \beta_2\text{HLD}^2 + \beta_3\text{ROA} + \beta_4\text{LEV} + \beta_5\text{Size} + \beta_6\text{Boardsize} + \beta_7\text{Indbsize} + \beta_8\text{Boardhold} + \beta_9\text{Ceoduality} + \beta_{10}\text{Normal} + \beta_{11}\text{State} + \beta_{12}\text{Mindex} + \beta_i\text{Industry} + \text{year} \quad (6)$$

HLD^2 represents the square of the shareholding ratio of the controlling shareholder;

The other control variables are the same as in Model 1; Model 2 is the second stage for testing the tortuous relation between tunneling and the controlled shareholding ratio.

If, for Bad Transfers sample,

(1) the coefficient of HLD^2 is significantly negative and

(2) the coefficient of HLD is significantly positive,

then, there is an inverted U-shaped relation between tunneling and the shareholding ratio of the controlling shareholder. Thus, we can confirm H1.

If, for Good Transfers sample,

(1) the coefficient of HLD^2 is significantly positive and

(2) the coefficient of HLD is significantly negative,

then, there is a U-shaped relation between tunneling and the shareholding ratio of the controlling shareholder. Thus, we can confirm H2.

Finally, we add the cube of the shareholding ratio (*HLD^3*) to Model 2 for testing the cubic relationship. It is our last model.

Model 3:

$$\begin{aligned}\mathrm{ORECTA} = \alpha_0 &+ \beta_1\mathrm{HLD} + \beta_2\mathrm{HLD}^2 + \beta_3\mathrm{HLD}^3 + \beta_4\mathrm{ROA} + \beta_5\mathrm{LEV} + \beta_6\mathrm{Size} + \beta_7\mathrm{Boardsize} \\ &+ \beta_8\mathrm{Indbsize} + \beta_9\mathrm{Boardhold} + \beta_{10}\mathrm{Ceoduality} + \beta_{11}\mathrm{Normal} + \beta_{12}\mathrm{State} \\ &+ \beta_{13}\mathrm{Mindex} + \beta_i\mathrm{Industry} + \mathrm{year}\end{aligned} \qquad (7)$$

HLD^3 represents the cube of the shareholding ratio of the controlling shareholder;

All other variables are defined as in Models 1 and 2.

Model 3 is designed to test the cubic relation between tunneling and the shareholding ratio of the controlling shareholder.

If, for Bad Transfers sample,

(1) the coefficient of HLD^3 is significantly positive, then there is a cubic relation;

(2) if the coefficient of HLD^2 is significantly negative; and

(3) the coefficient of HLD is significantly positive,

then there will be an N-shaped relation, and we can thus confirm H3.

If, for Good Transfers sample,

(4) the coefficient of HLD^3 is significantly negative, then there is a cubic relation.

(5) Furthermore, if the coefficient of HLD^2 is significantly positive; and

(6) the coefficient of HLD is significantly negative,

then, there will be an inverted N-shaped relation, and we can thus confirm H4.

Table Ⅹ presents the regression results of the full, Bad Transfers and Good Transfers samples. For Model 1, the coefficients of HLD are not significant except for Good Transfers sample, this result indicate that H1 is not strongly supported. For Bad Transfers sample, we first examine Model 2. The coefficients of HLD and HLD^2 are 1.79 and -1.74, respectively, and both are significant. This result confirms H2 of our theoretical conjecture, which posits that the quadratic relationship between the controlled shareholding ratio and tunneling is an inverted-U shape (incline-decline). For Model 3, the coefficients of HLD, HLD^2 and HLD^3 are 1.207, -3.492 and 2.983, respectively, and all are significant. This result indicates that the cubic relationship between the controlled shareholding ratio and tunneling is an N shape (incline-decline-incline), which confirms H3 of our theoretical conjecture.

For Good Transfers sample, we first examine Model 2. The coefficients of HLD and HLD^2 are -0.328 and 0.545, respectively, and both are significant. This result confirms H2 of our theoretical conjecture, which indicates that the quadratic relationship between the controlled shareholding ratio and tunneling is a U shape (decline-incline). For Model 3, the coefficients of HLD, HLD^2 and HLD^3 are -1.325, 3.414 and -2.457, respectively, and all are significant. This result indicates that the cubic relationship between the controlled shareholding ratio and tunneling is an inverted N shape (decline-incline-decline), which confirms H4 of our theoretical conjecture.

Across the full sample, the coefficients of HLD, HLD^2 and HLD^3 for Model 3 are not significant.

Overall, the results from the regression model are consistent with our theoretical conjectures, and indicate that divide the whole sample into Good Transfers and Bad Transfers capture more insight of the relationship of the two variables. .

(Insert Table Ⅹ here.)

Robustness

A. Endogeneity

The correlation between the measures of tunneling and operational performance may suffer from an endogeneity problem when *ROA* is not exogenous because we find that *ORECTA* and *ROA* impact one another in the results of the Granger causality test (see Tables Ⅸ-a, Ⅸ-b and Ⅸ-c), while we cannot find this correlation between *ORECTA* and *HLD*. To address this issue, we use cash flow per share and growth rate of net profit as the instrumental variables for *ROA*, and employ two-stage least squares (2SLS), LIML, GMM and IGMM approaches in the empirical test. Tables Ⅺ-a, Ⅺ-b and Ⅺ-c report the estimates of the OLS model without *ROA*, OLS model with *ROA*, 2SLS model, LIML model, GMM model and IGMM for full sample, Bad Transfers and Good Transfers.

(Insert Table Ⅺ-a here.)

(Insert Table Ⅺ-b here.)

(Insert Table Ⅺ-c here.)

Because there is no heteroskedasticity in the models reported in Table Ⅹ, we use a Hausman specification test to find any endogenous variables in the 2SLS model. Tables Ⅻ-a, Ⅻ-b and Ⅻ-c report the results for full sample, Bad Transfers and Good Transfers, respectively.

(Insert Table Ⅻ-a here.)

(Insert Table Ⅻ-b here.)

(Insert Table Ⅻ-c here.)

Tables Ⅻ-a and Ⅻ-b show that there is an endogenous variable (ROA) in the model of full sample and Bad Transfers sample. Thus, using instrumental variables and 2SLS, LIML, GMM and IGMM approaches to address this issue is apposite. In addition, the results reported in tables Ⅺ-a and Ⅺ-b are statistically similar to the main results of the full sample and Bad Transfers sample reported in table Ⅹ.

Table Ⅻ-c shows that there is no endogenous variable (ROA) in the model of Good Transfers sample. These results ensure that our results from Good Transfers sample are robust in table Ⅹ.

B. Alternative Measures of CAR

We re-compute the CAR using the Fama-French-Cohart four-factor model and re-divide the good- and Bad Transfers samples according to the CAR. We performed propensity score matching to form Good Transfers and Bad Transfers sample groups.

The results are statistically similar to the main results reported in Table Ⅹ.

C. Alternative Measures of Tunneling

We use another tunneling measurement, the private benefits of control (PBC), as a measure of tunneling activity. The following formula is used to calculate PBC:

$$\mathrm{PBC} = \frac{TP - NA}{NA} - EP = \frac{TP - NA}{NA} - \sum_{i=1}^{3} \beta_i \times ROE_{t-i}/(\beta_1 + \beta_2 + \beta_3)$$

$$\mathrm{ROE}_t = \alpha + \beta_i ROE_{t-i} \qquad (8)$$

Barclay and Holderness (1989) use PBC to measure the private benefits of control rights. We use the computed PBC to conduct the same tests and regressions. The results are statistically similar to the main results reported in Table Ⅹ. Thus, the results of the robustness tests confirm the findings in this study.[13]

Conclusion

In this paper, we present a theoretical conjecture depicting the causal effects of the controlled shareholding ratio on tunneling activity under two scenarios—Good Transfers and Bad Transfers—based on the market performance of firms after a control rights transfer event. We also test the theoretical conjectures using data for 456 control rights transfer samples and 1,368 firm-year observations over a 10-year study period from 2000 to 2010. The results generally confirm the theoretical predictions and show that controlled shareholding ratio has a significant effect on tunneling behavior, although the impact paths are different between Good Transfers and Bad Transfers. The effect reveals a cubic relationship. Graphically, the effect of Bad Transfers forms an N shape, and the effect of Good Transfers firms an

[13] The results of the robustness tests are available upon request.

inverted-N shape. Furthermore, there are at least two turning points in the controlled shareholding ratio that cause tunneling behavior to change. Thus, these findings expand the understanding of tunneling behavior in a transitional economy. Given that tunneling activity is still occurring in most markets worldwide, this evidence is relevant for global corporate governance.

References

Allen, F., Qian,J., Qian, M.J.. (2005). Law, finance, and economic growth in China. *Journal of Financial Economics*, 77(1), 57-116.

Bae, K., Kang, J., Kim, J.. (2002). Tunneling or value added? Evidence from mergers by Korean business groups. *Journal of Finance*. 57, 2695-2740.

Bai, Y.X., and Wu L.S. (2008). The Impact of Takeovers and Change of Ultimate Control on Operating Performance of State-owned Enterprises. *Journal of Financial Research*, 6, 130-143.

Barclay, M. J., Holderness, C. G. (1989). Private benefits from control of public corporations. *Journal of Financial Economics*, 25, 371-395.

Bayne, D.C. (1963). A philosophy of corporate control. *University of Pennsylvania Law Review*, 112.

Bebchuk, L.A. (1994). Efficient and Inefficient Sales of Corporate Control. *The Quarterly Journal of Economics*, 109(4), 957－993.

Chan,K.,Hu S.Y. and Wang Y.Z. (2003). When will the controlling shareholder expropriate the investors? cash flow rights and investment opportunity perspective. *Academia Economic Papers,* 31, 301-331.

Claessens S., Simeon D., Joseph F., and Lang,L. (2002). Disentangling the incentive and entrenchment effects of large shareholdings, *Journal of Finance*, 57, 2741-2771.

Faccio, M. and Larry H. P Lang. (2002). The ultimate ownership of Western European Corporation. *Journal of Financial Economics*, 65, 365-395.

Fan, G., Wang X.L., Zhu,H.P. (2009). NERI INDEX of Marketization of China's Provinces 2009 Report. *Economic Science Press*, Beijing, 259-288.

Gao,L. Kling,G. (2008). Corporate governance and tunneling: Empirical evidence from China. *Pacific-Basin Finance Journal*, 16, 591–605.

Green, S. (2003). China's Stock Market, Profile Books Ltd., London.

Jennings, R.W. (1956). Trading in corporate control. *California Law Review* ,44, 1-39.

Jiang, G.H., Charles M. C. Lee, and Heng,Y. (2010). Tunneling through intercorporate loans: The China experience. *Journal of Financial Economics,* 98, 1-20.

Johnson, S., Boone, P. Breach, A. and Friedman, E. (2000). Corporate governance in the Asian financial crisis. *Journal of Financial Economics,* 58, 141-186.
Kahan.M. (1993). Sale of Corporate Control. *Journal of Law, Economics, & Organization*, 9(2), 368-379.
Kini O., Kracaw, W. Mian, S. (2004). The nature of discipline by corporate takeovers. *The Journal of Finance*, 59(4), 1511-1552.
La Porta, R., Lopez- de- Silanes, F., Shleifer, A. and Vishny, R. W. (2000). Investor Protection and Corporate Governance. *Journal of Financial Economics*, 58, 3-27.
La Porta, R., Lopez- de- Silanes, F., Shleifer, A. and Vishny, R. W. (1998). Law and Finance. *Journal of Political Economy*, 106, 1113-1155.
La Porta, R., Lopez- de- Silanes, F., Shleifer, A. and Vishny, R. W. (2002). Investor Protection and Corporate Valuation. *Journal of Finance,* 57, 1147-1170.
Lemmon, M. and Lins, K. (2003). Ownership Structure, Corporate Governance and Firm Value: Evidence from the East Asian Financial Crisis. *Journal of Finance,* 58, 1445-1468.
Li G.P. (2010). The pervasiveness and severity of tunneling by controlling shareholders in China. *China Economic Review,* 21, 310–323.
Li, Z.Q., Sun,Z., and Wang, Z.W. (2004). Tunneling and Ownership Structure: Evidence from the Lending of Controlling Shareholder from the Chinese Listed Companies. *Accounting Research*, 12, 3-13.
Lins, K. (2003). Equity ownership and firm value in emerging markets. *Journal of Financial and Quantitative Analysis,* 38, 159-184.
Liu Q., and Lu Z. (2007). Corporate governance and earnings management in the Chinese Listed Companies: A Tunneling Perspective. *Journal of Corporate Finance.* 13, 881-906.
MacNeil, I.. (2002). Adaptation and convergence in corporate governance: the case of Chinese listed companies. *Journal of Corporate Law Studies,* 2, 289-344.
McConnell, John J., and Henri S. (1990). Additional evidence on equity ownership and corporate value. *Journal of Financial Economics,* 27, 595-612.
Mitchell, Mark, and Kenneth L. (1990). Do bad bidders become good targets?. *Journal of Political Economy*, 98, 372-298.
Mork R., Shleifer,A. Vishney,R.W. (1988). Management ownership and market valuation: an empirical analysis. *Journal of Financial Economics,* 20, 293-315.
Offenberg, D. (2009). Firm size and the effectiveness of the market for corporate control. *Journal of Corporate Finance,* 15, 66–79.
Peng W. Qian., Wei K.C. John, and Yang Z.S. (2011). Tunneling or propping: Evidence from connected transactions in China. *Journal of Corporate Finance.*, 17, 306–325.
Schwert G. (1996). Markup Pricing in Mergers and Acquisitions. *Journal of Financial Economics,* 41, 153-192.
Shleifer, A. and Vishny, R.W. (1986). Large Shareholders and Corporate Control. *Journal of Political Economy,* 94(3), 461-488.
Shleifer, A. and Vishny, R.W. (1997). A Survey of Corporate Governance. *Journal of Finance,* 52,

737-783.
Stulz, ReneM. (1988). Managerial control of voting rights: Financing policies and the market for corporate control. *Journal of Financial Economics,* 20, 25-54.
Tang, Z.M., and Jiang Wei. (2002). A Study on the Expropriation Degree of Large Shareholders of China's Listed Companies. *Economic Research Journal*. 4, 44-50.
Tu, Guoqian and Frank Yu (2015). Tunneling or Not? The Change of Legal Environment on the Effect of Post-Privatization Performance. *Journal of Business Ethics*, 129, 491-510.
Wang, Z.H., and Zhang Y. (2004). The block stock transfer and corporate control. *Management World* , 5, 116-126.
Xi, J.F., and Yu P.Y. (2006). The Study on Transfer of the Control Right and It's Related Operating Performance and Earnings Management. *Nankai Business Review,* 9(4), 42-48

Table Ⅰ. Ownership structure of public companies in China from 2000 to 2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
State-owned shares	0.82	0.81	0.77	0.68	0.64	0.61	0.59	0.57	0.58	0.64	0.60
Legal person shares	0.14	0.15	0.19	0.31	0.34	0.36	0.38	0.37	0.35	0.26	0.22
Private shares	0.04	0.04	0.04	0.01	0.03	0.03	0.03	0.07	0.07	0.10	0.18

(Data source: China Stock Market Accounting Research (CSMAR))

TableⅡ. China's corporate control market development from 1998 to 2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Acquisitions	0	0	0	44	330	522	732	924	388	643	452

Transfers	0	0	0	8	65	175	67	302	205	269	237

(Data source: CSMAR)

Table Ⅲ. The tunneling activity of public companies from 2000 to 2010

This table presents the tunneling activity of public companies of China from 2000 to 2010. Following the methodology of Liu and Lu (2007) and Jiang *et al.* (2010),we use other receivables over total assets (ORECTA) to measure the severity of tunneling. The higher the ORECTA, the more sever the tunneling.

Tunneling	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
ORECTA	0.088	0.078	0.073	0.071	0.071	0.079	0.113	0.041	0.033	0.028	0.023

(Data source: CSMAR)

Table Ⅳ. Descriptive Statistics

Table IV presents the descriptive statistics of the sample firms. We use other receivables as a percentage of total assets (*ORECTA*) to measure tunneling severity. Other firm characteristics are as follows: (1) *HLd* represents the shareholding ratio of the controlling shareholder; (2) *ROA* is the return on total assets and measures the overall operation performance; (3) *LEV* is the asset-liability ratio and represents the financial risks of the company; (4) *SIZE* is the logarithm of the firm's total assets and represents firm size; (5) *Boardsize* is the size of the board of directors, and different board sizes have different balancing abilities with respect to the activity of the controlling shareholder; (6) *Boardhold* is the shareholding ratio of the board of directors; (7) Q1 is the first quantile (25%) of the full sample; Q3 is the third quantile (75%) of the full sample; and (8) CAR is the cumulative abnormal return measured with a value-weighted market model estimated over the period [-42, 126]. All variables are averaged across the period and across firms. All observations are processed by excluding singular values (we winsorize all continuous variables, except the dummy variables, at the 1st and 99th percentiles).

Variable	CAR	ORECTA	HLD	ROA	LEV	SIZE	Boardsize	Boardhold
N	1368	1368	1368	1368	1368	1368	1368	1368
Mean	0.0260	0.0713	0.3433	0.0394	0.5353	21.1631	9.2902	0.0122
Median	0.0255	0.0315	0.3049	0.0470	0.5356	21.0315	9.0000	0.0000
Std.dev.	0.5827	0.1061	0.1476	0.0839	0.2387	1.1072	1.9801	0.0580
Q1	-0.2834	0.0104	0.2341	0.0218	0.3879	20.4009	9.0000	0.0000
Q3	0.3105	0.0820	0.4427	0.0774	0.6444	21.7967	10.0000	0.0002

Table Ⅴ-a. Summary of the control variables of the matched samples

The samples are matched by firm year, industry and size. Size is the natural logarithm of total assets (Ln(Total Asset)). There are 13 industries according to the "Listed Company Industry Classification Guidelines" issued by the China Securities Regulatory Commission. Code A refers to agriculture, forestry, animal husbandry and fishery; Code B refers to extractive industries. Code C refers to manufacturing; Code D refers to electricity, gas and water production and supply industry; Code E refers to the building industry; Code F refers to transportation and warehousing. Code G refers to the IT industry; Code H refers to wholesale and retail trade; Code J refers to real estate; Code K refers to social services; Code L refers to communication and cultural industries; and Code M refers to a comprehensive class. Code I refers to finance and insurance. We exclude companies from the Code I industry because those companies have different sets of accounts, voucher preparation, financial processes and specific business processes compared with the other industries.

	Good Transfers sample		Bad Transfers sample	
Industry code	Number of Firms	Size	Number of Firms	Size
A	10	20.97	5	21.01
B	4	22.56	2	21.54
C	128	21.01	115	21.18
D	9	21.61	9	22.42
E	4	22.48	4	21.22
F	5	21.57	3	21.08
G	12	20.84	18	20.75
H	20	20.88	12	20.81
J	18	21.81	13	21.63
K	12	21.18	5	21.01
L	0	--	3	20.91
M	19	20.83	26	21.30
Total	241	21.13	215	21.20

Table Ⅴ-b. The main statistics of the full, Good Transfers and Bad Transfers samples

Table 5b reports the statics of the three main variables in three periods under the full sample and the two sub-samples. ORECTA measures tunneling behavior, HLD measures the shareholding ratio of the controlling shareholder and ROA measures firm performance. The numbers are reported in three periods: T-1, T and T+1. "T-1" refers to the year before the event year, "T" refers to the year when the event occurred and "T+1" refers to the year after the event year. All variables are averaged across firms. The p-values of the equality t-test of Good Transfers and Bad Transfers samples are reported in the last row of each variable. The p-values of the equality t-test of periods T-1 and T+1 are reported in the last column.

		T-1	T	T+1	P value (T-1, T+1)
ORECTA	Full	0.0768	0.0737	0.0634	0.0287
	Bad Transfers	0.0795	0.0792	0.066	0.0101
	Good Transfers	0.0743	0.0687	0.0611	0.0512
	P value	0.6208	0.0891	0.6008	
HLD	Full	0.3572	0.3436	0.3291	0.0019

	Bad Transfers	0.3643	0.347	0.3311	0.0278
	Good Transfers	0.351	0.3405	0.3273	0.0597
	P value	0.356	0.6408	0.7675	
ROA	Full	0.0441	0.0391	0.0352	0.0586
	Bad Transfers	0.0507	0.0426	0.0401	0.0863
	Good Transfers	0.0381	0.0359	0.0319	0.359
	P value	0.0501	0.0766	0.0726	

Table Ⅵ. The tunneling behavior under different ranges of control shareholding ratios

The sample is divided into 10 deciles based on the controlled shareholding ratio in the pre-event period (T-1), and the ORECTA are computed at time T (the event year) for the full, Bad Transfers and Good Transfers samples. The P value of t-test in the last column test the equality of Good Transfers and Bad Transfers samples.

Deciles of HLD
1
2
3
4
5
6
7
8
9
10

Table Ⅶ-a. Factorial ANOVA

We use HLD, ROA, and a term representing the interaction of HLD and ROA to explain the changes in ORECTA. The results show that the overall model is statistically significant for all three samples (i.e., the full, Bad Transfers and Good Transfers samples), which indicate that HLD and ROA can explain the changes in ORECTA, whereas the interactive term does not add any significant explanation power to the analysis. Therefore, we conclude that the controlled shareholding ratio and firm performance have a significant effect on tunneling behavior.

	Source	Partial SS	df	Mean Square	F	Prob>F
ORECTA (full samples)	Model	3.43	99	0.035	3.68	0.000
	G (HLD)	0.287	9	0.319	3.39	0.004
	G (ROA)	2.319	9	0.258	27.35	0.000
	G(HLD)*G(ROA)	0.579	81	0.007	0.76	0.943
	Residual	11.944	1268	0.009		
	Total	15.377	1367	0.011		
ORECTA (Bad Transfers samples)	Model	2.352	99	0.028	2.26	0.000
	G (HLD)	0.336	9	0.037	3.55	0.003
	G (ROA)	0.914	9	0.102	9.66	0.000
	G(HLD)*G(ROA)	0.607	81	0.007	0.71	0.971
	Residual	5.730	545	0.011		
	Total	8.082	644	0.013		
ORECTA (Good Transfers samples)	Model	2.25	99	0.023	2.82	0.000
	G (HLD)	0.256	9	0.028	3.53	0.000
	G (ROA)	1.165	9	0.129	16.04	0.000
	G(HLD)*G(ROA)	0.723	81	0.009	1.11	0.257
	Residual	5.028	623	0.008		
	Total	7.280	722	0.008		

Table Ⅶ-b. Factorial ANOVA

We use ORECTA, ROA, and a term representing the interaction between ORECTA and ROA to explain changes in HLD. The results indicate that the overall model is not statistically significant for any of the samples. ORECTA can explain the change in HLD for the full and Bad Transfers samples with significant explanatory power but not for the Good Transfers sample; again, the interactive term does not have any effect on HLD. Therefore, we can conclude that tunneling activity has a significant effect on the controlled shareholding ratio, whereas firm performance appears not to have a significant influence on the controlled shareholding ratio. However, because the model generally does not show significant results, we can infer that the effect is primarily in the direction from the shareholding ratio to tunneling rather than in the opposite direction.

	Source	Partial SS	df	Mean Square	F	Prob>F
HLD (full samples)	Model	2.388	99	0.024	1.12	0.210
	G(ORECTA)	0.332	9	0.037	1.71	0.082
	G(ROA)	0.211	9	0.023	1.09	0.368
	G(ORECTA)*G(ROA)	1.803	81	0.022	1.03	0.407

	Residual	27.377	1268	0.022		
	Total	29.765	1367	0.022		
HLD	Model					
(Bad	G(ORECTA)	2.60	97	0.027	1.11	0.23
Transfers	G(ROA)	0.445	9	0.049	2.05	0.032
samples)	G(ORECTA)*G(ROA)	0.146	9	0.016	0.67	0.734
	Residual	1.798	79	0.023	0.95	0.609
	Total	13.156	547	0.024		
		15.756	644	0.024		
HLD	Model					
(Good	G(ORECTA)	1.748	99	0.018	0.90	0.743
Transfers	G(ROA)	0.205	9	0.023	1.16	0.319
samples)	G(ORECTA)*G(ROA)	0.129	9	0.014	0.73	0.684
	Residual	1.425	81	0.018	0.90	0.728
	Total	12.240	623	0.020		
		13.988	722	0.019		

Table Ⅷ. Vector auto-regression of tunneling behavior, controlling shareholding ratios and the firm performance

The variables with a prefix of "L" are the lag terms of the variables; for example, "L1.ORECTA" is the one-lag term of ORECTA, and "L2.ORECTA" is the two-lag term of ORECTA. In this regression, period T+1 is set as Time 0, period T is set as lag 1, and period T-1 is lag 2.

For ORECTA, L1.ORECTA and L2.HLD are significantly positive, whereas L1.ROA is significantly negative; thus, these results imply that tunneling activity in the event year has a positive effect on tunneling behavior in the year after the transfer of control rights. In addition, the controlled shareholding ratio in the year prior to a control rights transfer has a significant positive effect on tunneling behavior in the year after the transfer. However, firm performance in the year of the transfer has a negative influence on tunneling behavior in the year after the event occurs.

For HLD, only L1.HLD has a significant effect on HLD. For ROA, L1.ORECTA is significantly negative, and L1.ROA is significantly positive, which indicates that tunneling activity in the year of a control rights transfer has a significant negative effect on firm performance following the control rights transfer. Firm performance in the year of an event has a significant positive effect on firm performance in the year following the event. These results are consistent with the findings of previous research.

	(1)	(2)	(3)
VARIABLES	ORECTA	HLD	ROA
L1.ORECTA	0.391	-0.011	-0.076
	(0.000)	(0.769)	(0.002)
L2.ORECTA	0.027	0.034	-0.000
	(0.334)	(0.376)	(0.994)
L1.HLD	-0.001	0.519	0.009

	(0.972)	(0.000)	(0.595)
L2.HLD	0.045	-0.009	-0.015
	(0.022)	(0.754)	(0.366)
L1.ROA	-0.180	-0.002	0.288
	(0.000)	(0.964)	(0.000)
L2.ROA	-0.026	0.002	-0.039
	(0.443)	(0.964)	(0.173)
Constant	0.034	0.166	0.037
	(0.000)	(0.000)	(0.000)
Observations	1366	1366	1366

Table Ⅸ-a Granger causality tests of the full sample

The results indicate that ORECTA is more likely to be a consequence of ROA and HLD and that HLD is not a consequence of ORECTA.

Equation	Excluded	Chi2	df	Prob>chi2
ORECTA	HLD	7.0082	2	*0.030*
ORECTA	ROA	33.604	2	*0.000*
ORECTA	ALL	39.795	4	*0.000*
HLD	ORECTA	0.7855	2	0.675
HLD	ROA	0.00333	2	0.998
HLD	ALL	0.85357	4	0.931
ROA	ORECTA	11.442	2	*0.003*
ROA	HLD	0.8243	2	0.662
ROA	ALL	12.593	4	0.013

Table Ⅸ-b Granger causality tests in the Bad Transfers sample

The results indicate that ORECTA is more likely to be a consequence of ROA and HLD, except for the first line of the table. When we test to determine whether ORECTA is the consequence of ROA, HLD or neither, the probabilities are 0.119, 0.000 and 0.000, respectively. However, this relationship is not significant when we test for HLD.

Equation	Excluded	Chi2	df	Prob>chi2
ORECTA	HLD	4.2512	2	*0.109*
ORECTA	ROA	20.063	2	*0.000*
ORECTA	ALL	23.924	4	*0.000*
HLD	ORECTA	0.54237	2	0.762
HLD	ROA	2.5154	2	0.284
HLD	ALL	2.736	4	0.603
ROA	ORECTA	6.0722	2	*0.048*
ROA	HLD	0.32683	2	0.849
ROA	ALL	7.0101	4	0.135

Table Ⅸ-c Granger causality tests in Good Transfers sample

The results indicate that ORECTA is more likely to be a consequence of ROA and HLD. However, this relationship is not significant when we test for HLD.

Equation	Excluded	Chi2	df	Prob>chi2
ORECTA	HLD	4.1095	2	*0.108*
ORECTA	ROA	14.299	2	*0.001*
ORECTA	ALL	17.746	4	*0.001*
HLD	ORECTA	2.9518	2	0.229
HLD	ROA	2.3491	2	0.309
HLD	ALL	4.1585	4	0.385
ROA	ORECTA	7.3596	2	*0.025*
ROA	HLD	0.27022	2	0.874
ROA	ALL	7.7321	4	0.102

Table Ⅹ Multiple regression analysis of the shareholding ratio and the tunneling of controlling shareholders for the *full, Bad Transfers and Good Transfers samples*

Model 1 tests the linear relationship between the two variables. Model 2 tests H1 and H2, the tortuous relationship between the two variables. Model 3 tests H3 and H4, the cubic relationship between the two variables. *ORECTA* is a measure of the level of tunneling severity of the controlling shareholder; *HLD* represents the shareholding ratio of the controlling shareholder; *ROA* is return on total assets and measures the overall operational performance of the company; *LEV* is the asset-liability ratio and represents the financial risk of the company; *SIZE* is the logarithm of the firm's total assets and indicates firm size; *Boardsize* is the size of the board of directors; different board sizes have different balancing capabilities relative to the activity of the controlling shareholder; *Boardhold* is the shareholding ratio of the board of directors; *Indbsize* represents the ratio of independent directors on the board of directors; *Ceoduality* represents whether the posts of general manager and chairman of the board of public companies are held by the same person, where 1 represents the general manager and chairman of the board being the same person and 0 represents the general manager and chairman of the board being separate individuals; *Normal* represents whether the public company has a normal trading status, where 1 represents the company with a normal trading status and 0 represents non-normal trading status; *State* represents the actual type of the company's controlling shareholder, where 1 represents a state-owned holding and 0 represents a holding that is not state-controlled; *Mindex* refers to the area's degree of marketization—which will affect the level of corporate governance—in which we use the market index (1997-2007) created by Fan Gang (2009), with 2008 following the index of 2007; and *Industry* is an industry dummy variable, and according to the industry classification standard of the China Securities Regulatory Commission (2001), we set 21 dummy variables (excluding the financial industry, the manufacturing industry classified by the second category, and other industries classified by the main category standard). HLD^2 represents the square of the shareholding ratio of the controlling shareholder; HLD^3 represents the cube of the shareholding ratio of the controlling shareholder.

	Full Sample			Bad Transfers			Good Transfers		
VARIABLES	***Model1***	***Model2***	***Model3***	***Model1***	***Model2***	***Model3***	***Model1***	***Model2***	***Model3***
HLD	0.035	-0.204	0.063	0.006	1.799	1.207	0.091	-0.328	-1.325
	(0.296)	(0.083)	(0.867)	(0.906)	(0.010)	(0.013)	(0.077)	(0.077)	(0.034)
HLD2		0.312	-0.453		-1.740	-3.492		0.545	3.414
		(0.056)	(0.671)		(0.007)	(0.009)		(0.032)	(0.051)
HLD3			0.649			2.983			-2.457
			(0.474)			(0.008)			(0.094)
ROA	-0.331	-0.335	-0.333	-0.408	-0.675	-0.398	-0.228	-0.237	-0.249
	(0.000)	(0.000)	(0.000)	(0.003)	(0.001)	(0.003)	(0.017)	(0.012)	(0.007)
LEV	0.038	0.038	0.038	0.028	-0.017	0.022	0.098	0.101	0.102
	(0.344)	(0.333)	(0.342)	(0.659)	(0.728)	(0.713)	(0.060)	(0.051)	(0.045)
Size	-0.014	-0.015	-0.015	-0.018	0.003	-0.015	-0.016	-0.017	-0.016
	(0.011)	(0.007)	(0.009)	(0.032)	(0.727)	(0.062)	(0.039)	(0.025)	(0.027)
Boardsize	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.002	0.002
	(0.728)	(0.751)	(0.754)	(0.884)	(0.925)	(0.826)	(0.542)	(0.661)	(0.623)
Boardhold	-0.094	-0.094	-0.095	-0.103	0.011	-0.112	-0.160	-0.169	-0.167
	(0.035)	(0.033)	(0.031)	(0.094)	(0.923)	(0.074)	(0.093)	(0.073)	(0.062)

Indbsize	-0.065	-0.066	-0.066	0.045	-0.009	0.033	-0.127	-0.134	-0.138
	(0.127)	(0.125)	(0.123)	(0.486)	(0.835)	(0.605)	(0.030)	(0.022)	(0.019)
Ceoduality	0.019	0.019	0.019	0.020	0.018	0.019	0.014	0.014	0.014
	(0.171)	(0.152)	(0.155)	(0.324)	(0.377)	(0.350)	(0.392)	(0.373)	(0.363)
State	-0.015	-0.015	-0.015	-0.017	0.008	-0.018	-0.011	-0.010	-0.010
	(0.123)	(0.117)	(0.117)	(0.243)	(0.781)	(0.219)	(0.353)	(0.387)	(0.384)
Normal	-0.081	-0.080	-0.080	-0.120	0.008	-0.122	-0.029	-0.028	-0.029
	(0.000)	(0.000)	(0.000)	(0.000)	(0.771)	(0.000)	(0.263)	(0.266)	(0.254)
Mindex	-0.002	-0.002	-0.002	-0.004	-0.001	-0.004	-0.000	-0.000	-0.000
	(0.379)	(0.363)	(0.383)	(0.177)	(0.837)	(0.200)	(0.889)	(0.945)	(0.870)
Industry	Control	Control	Control	Control	Control	Control	Control	Control	Control
Constant	0.464	0.513	0.483	0.633	-0.386	0.464	0.369	0.463	0.551
	(0.000)	(0.000)	(0.000)	(0.000)	(0.184)	(0.004)	(0.005)	(0.000)	(0.000)
Observations	456	456	456	215	215	215	241	241	241
R-squared	0.329	0.333	0.334	0.462	0.596	0.475	0.345	0.360	0.369

Robust p-values are report in parentheses. We also do the White's test to ensure our results reported are robust and no evidence shows heteroskedasticity in our models.

Table Ⅺ-a. Endogeneity estimation for full sample

Variable	ols_no_roa	ols_with_roa	tsls	liml	gmm	igmm
HLD	0.2121	0.063	0.1319	0.1314	0.1063	0.1063
	0.5886	0.8673	0.677	0.6781	0.8844	0.8844
HLD2	-0.8985	-0.4534	-0.7163	-0.7152	-0.8314	-0.8314
	0.4105	0.6706	0.419	0.4199	0.6926	0.6926
HLD3	0.9928	0.6494	0.8712	0.8704	0.783	0.783
	0.2782	0.4744	0.2394	0.24	0.6241	0.6241
LEV	0.0757	0.0375	0.0558	0.0557	0.195	0.195
	0.0208	0.3417	0.2048	0.2064	0.5234	0.5234
Size	-0.0213	-0.0146	-0.0049	-0.0049	0.0163	0.0163
	0.0001	0.009	0.3248	0.3283	0.7054	0.7054
Boardsize	0.0015	0.0008	-0.0058	-0.0058	0.0034	0.0034
	0.5423	0.7539	0.0072	0.0072	0.8702	0.8702
Boardhold	-0.144	-0.0954	-0.0978	-0.0975	0.0249	0.0249
	0.0026	0.0313	0.0592	0.0606	0.9221	0.9221
Indbsize	-0.0989	-0.0663	-0.0258	-0.0258	-0.4058	-0.4058
	0.0257	0.1228	0.72	0.7201	0.6118	0.6118
Ceoduality	0.0188	0.0193	0.0191	0.0191	0.0502	0.0502
	0.1722	0.1552	0.1599	0.1606	0.438	0.438
State	-0.0133	-0.0152	-0.0152	-0.0152	-0.0452	-0.0452
	0.1835	0.1165	0.0944	0.0942	0.5016	0.5016
Normal	-0.0735	-0.0802	-0.0756	-0.0757	-0.091	-0.091
	0.0011	0.0002	0.0039	0.0039	0.0744	0.0744
Mindex	-0.0016	-0.0019	-0.0013	-0.0013	-0.0143	-0.0143
	0.4933	0.3826	0.4791	0.4802	0.6086	0.6086
Industry	Control	Control	Control	Control	Control	Control
ROA		-0.3326	-0.6027	-0.6054	-0.3431	-0.3431

		0.0001	0.0151	0.0155	0.6417	0.6417
Constant	0.5805	0.4828	0.2841	0.2838	-0.5572	-0.5572
	0	0	0.0009	0.0009	0.7538	0.7538
Observations	456	456	312	312	312	312
R-squared	0.2334	0.282	0.1848	0.1842		

Table Ⅺ-b. Endogeneity estimation for Bad Transfers

Variable	ols_no_roa	ols_with_roa	tsls	liml	gmm	igmm
HLD	1.3526	1.2065	0.5395	0.533	0.2873	0.2873
	0.0069	0.0135	0.1997	0.2073	0.8321	0.8321
HLD2	-3.9738	-3.4916	-1.8367	-1.8174	-1.4882	-1.4882
	0.0039	0.0095	0.1097	0.1152	0.686	0.686
HLD3	3.3535	2.9832	1.6432	1.6279	1.1054	1.1054
	0.0034	0.0085	0.0757	0.0799	0.7145	0.7145
LEV	0.0778	0.0222	0.0309	0.0288	0.0421	0.0421
	0.0666	0.7133	0.3739	0.4261	0.7538	0.7538
Size	-0.0231	-0.0154	-0.0093	-0.0091	0	0
	0.0005	0.062	0.0498	0.0602	0.9976	0.9976
Boardsize	0.0025	0.0008	-0.0017	-0.0018	-0.0035	-0.0035
	0.4745	0.8259	0.533	0.5102	0.6136	0.6136
Boardhold	-0.168	-0.1115	-0.1248	-0.1214	-0.2303	-0.2303
	0.0088	0.0736	0.0162	0.0245	0.0239	0.0239
Indbsize	-0.0297	0.0333	0.0923	0.0927	-0.0592	-0.0592
	0.6399	0.6054	0.3692	0.3675	0.8445	0.8445
Ceoduality	0.0247	0.0192	0.0311	0.0303	0.0391	0.0391
	0.245	0.3502	0.1006	0.1131	0.2505	0.2505
State	-0.019	-0.0176	-0.0158	-0.016	-0.0267	-0.0267
	0.2099	0.2185	0.2681	0.2653	0.3758	0.3758
Normal	-0.1118	-0.122	-0.096	-0.0961	-0.0114	-0.0114
	0.0017	0.0003	0.0082	0.0081	0.916	0.916
Mindex	-0.0046	-0.0039	-0.0048	-0.0047	-0.019	-0.019
	0.1788	0.2001	0.0631	0.0692	0.1147	0.1147
Industry	Control	Control	Control	Control	Control	Control
ROA		-0.3983	-0.5204	-0.5473	-0.1126	-0.1126
		0.0033	0.008	0.0165	0.851	0.851
Constant	0.5735	0.4641	0.3237	0.3229	1.0179	1.0179
	0.0001	0.0038	0.0009	0.001	0.0817	0.0817
Observations	215	215	152	152	152	152
R-squared	0.3108	0.3794	0.3002	0.297		

Table XI-c. Endogeneity estimation for Good Transfers

Variable	ols_no_roa	ols_with_roa	tsls	liml	gmm	igmm
HLD	-1.1776	-1.3245	-0.7813	-0.7848	2.3726	2.3726
	0.0618	0.0342	0.1163	0.1277	0.7115	0.7115
HLD2	2.9968	3.414	1.5679	1.5718	-7.1118	-7.1118
	0.0866	0.051	0.2396	0.255	0.688	0.688
HLD3	-2.1301	-2.4573	-0.7202	-0.7207	6.1388	6.1388
	0.1449	0.0941	0.5133	0.528	0.662	0.662
LEV	0.1229	0.102	0.1096	0.1081	-0.1455	-0.1455
	0.0125	0.0446	0.0724	0.0806	0.7913	0.7913
Size	-0.0216	-0.0164	0.0025	0.0034	0.0263	0.0263
	0.0058	0.0271	0.7719	0.7142	0.6473	0.6473
Boardsize	0.0024	0.002	-0.0086	-0.0086	-0.014	-0.014
	0.5609	0.6235	0.0318	0.034	0.3517	0.3517
Boardhold	-0.1853	-0.167	-0.1969	-0.1952	-0.3349	-0.3349
	0.0406	0.0615	0.0831	0.0933	0.3203	0.3203
Indbsize	-0.154	-0.1383	-0.1502	-0.1484	-0.4562	-0.4562
	0.0118	0.0187	0.1953	0.2104	0.5275	0.5275
Ceoduality	0.0115	0.014	0.0114	0.0116	-0.0665	-0.0665
	0.4679	0.3633	0.4355	0.4342	0.6538	0.6538
State	-0.0075	-0.0101	-0.0164	-0.0174	-0.1259	-0.1259
	0.5231	0.3838	0.1755	0.1692	0.5844	0.5844
Normal	-0.0269	-0.0287	-0.034	-0.0352	-0.1194	-0.1194
	0.2959	0.2542	0.2226	0.2276	0.5151	0.5151
Mindex	0.0002	-0.0005	0.0028	0.0028	0.0001	0.0001
	0.935	0.8699	0.3388	0.3501	0.9892	0.9892
Industry	Control	Control	Control	Control	Control	Control
ROA		-0.2487	-0.9044	-0.9817	-2.1662	-2.1662
		0.0068	0.1893	0.1895	0.4713	0.4713
Constant	0.6254	0.5513	0.2006	0.1889	0.5359	0.5359
	0.0001	0.0001	0.1515	0.198	0.446	0.446
Observations	241	241	160	160	160	160
R-squared	0.2454	0.2719	-0.0473	-0.1071		

Table Ⅻ-a Hausman specification test for full sample

Test: Ho: difference in coefficients not systematic

chi2(31) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 60.14
Prob>chi2 = 0.0013
(V_b-V_B is not positive definite)

Table Ⅻ-b Hausman specification test for Bad Transfers

Test: Ho: difference in coefficients not systematic

chi2(30) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 57.59
Prob>chi2 = 0.0018
(V_b-V_B is not positive definite)

Table Ⅻ-c Hausman specification test for Good Transfers

Test: Ho: difference in coefficients not systematic

chi2(28) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 37.77
Prob>chi2 = 0.1028
(V_b-V_B is not positive definite)

Figure Ⅰ-a Bad Transfers　　Figure Ⅰ-b Good Transfers

Figure I The tortuous relationship between the controlled shareholding ratios and the tunneling activities

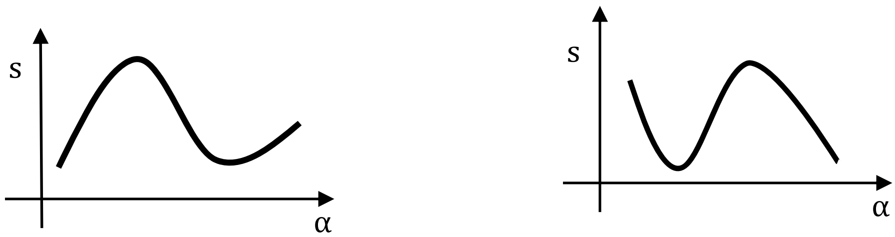

Figure Ⅱ-a Bad Transfers: N-shaped relationship　　Figure Ⅱ-b Good Transfers: inverted N-shaped relationship

Figure II The cubic relationship between the controlled shareholding ratios and the tunneling activities