

Whose interests do independent directors represent? – Examining the ownership-contingent nature of the relationship between board independence and tunnelling*

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Abstract

When shareholding is widely dispersed, board independence can serve to protect shareholders against self-serving managerial behaviour. When a large shareholder is in a more dominant position, shareholder interests may be more difficult to define as the interests of the largest shareholder and the minority shareholders may diverge. The largest shareholder may extract resources from the company on preferential terms (e.g. tunnelling) and thereby harm the minority shareholders. When a large shareholder is present, it is unclear whether the independent directors will serve the interests of the largest shareholders or those of the minority shareholders. We examine whether more independent boards may be better at protecting minority shareholders when there is greater relative minority shareholder power. Using a sample of 13,579 firm-years of Chinese companies, we find a significant interaction between board independence and relative minority shareholder power in a tunnelling model. These results suggest that independent boards are more likely to inhibit tunnelling when minority shareholders have greater voting influence over board elections.

Keywords: Board Independence, Minority Shareholders, Ownership Concentration, Tunnelling

JEL classification: G30, G34, G38

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独立董事代表谁的利益？基于股权结构对董事会独立性与大股东掏空关系的影响研究

摘要

高度分散的股权结构下，董事会独立性有助于限制管理层自利行为以保护股东利益不受侵害。然而，当大股东处于主导地位时，由于大股东利益与中小股东利益可能产生分歧，因此很难清晰地界定股东利益。大股东会运用掏空等方式侵占公司利益，进而损害中小股东利益。因此，当上市公司存在大股东时，很难判断独立董事代表大股东还是中小股东的利益。本文研究：当中小股东制衡能力较强时，聘任更多的独立董事能否更好地保护中小股东利益。本文以中国 13,579 家主板公司-年度数据为样本，发现董事会独立性与中小股东制衡能力的交互作用对大股东侵占具有显著影响。研究表明，当中小股东有更高的投票权时，独立董事更可能抑制大股东掏空行为。

关键词：董事会独立性、中小股东、股权集中、掏空

I. Introduction

A wide variety of research suggests that independent directors can enhance firm decision making and protect the interests of the firm's shareholders (e.g. Fama and Jensen, 1983; Bhagat *et al.*, 1987; Weisbach, 1988; Peasnell, Pope, and Young, 2005; Booth *et al.*, 2002). These studies are generally premised on agency theory, which posits that there is a divergence of interests between the firm's shareholders (the principals) and the firm's managers (the agents) in which management may engage in self-serving behaviour that causes harm to the shareholders (e.g. Jensen and Meckling, 1976). Because the shareholders have the power to vote the directors onto (or off) the board, independent directors have an incentive to protect the interests of the shareholders rather than those of the management. This traditional agency theory model is premised on a widely dispersed ownership structure, as is common in the US.

In traditional agency theory, shareholders are viewed as a homogeneous group which could face harm from self-serving managerial behaviour. Because all of the shareholders in a company could be harmed by adverse managerial behaviour, there is a convergence of interests among the shareholders. The independent directors can therefore have a clear sense of what protecting shareholder interests means: protecting the shareholders from self-serving managerial behaviour.

A somewhat different picture emerges when there is a large shareholder who owns a material portion of the company's shares. This large-shareholder ownership structure is common in many countries, with La Porta *et al.* (1999) finding that over 63% of companies around the world have a dominant shareholder. If there is a dominant shareholder, management may serve the interests of the largest shareholder, even if the interests of the largest shareholder conflict with those of the minority shareholders (e.g. Lei *et al.*, 2013; Shan, 2013; Du *et al.*, 2013). This conflict represents the main agency problem in China (Yao *et al.*, 2010). The potential for large shareholders to harm the interests of minority shareholders is sometimes called the "expropriation" of minority shareholders (e.g. Berkman *et al.*, 2009). Reflecting on this possible expropriation of minority shareholders, Bebchuk, in *The New York Times* (16 September 2014), noted that the expropriation of minority shareholders could be effected by "divert[ing] value from [the company] to other entities" owned by the largest shareholder.

When there is a potential conflict between the largest shareholder and the minority shareholders (rather than between shareholders and management), the role of the independent directors is less clear. In this setting, the question arises as to which shareholders' interests the independent directors will protect: the interests of the dominant shareholder or those of the minority shareholders. While Chinese securities regulations require independent directors to serve the interests of minority shareholders, research examining the relationship between board independence and the expropriation of minority

shareholders has produced mixed results. For example, Gao and Kling (2008) and Qian and Zhou (2012) find a negative relationship between board independence and minority shareholder expropriation, suggesting that independent directors may serve the interests of minority shareholders. In contrast, Huyghebaert and Wang (2012) find a positive relationship between board independence and minority shareholder expropriation among firms in which the state is the largest shareholder. For firms with a largest shareholder that is not state related, they find no relationship between board independence and minority shareholder expropriation. Huyghebaert and Wang's (2012) results suggest that an independent director may sometimes serve the interests of the largest shareholder (when the largest shareholder is a state entity) rather than those of the minority shareholders.

In addition to board independence, the ownership among minority shareholders may also influence the prevalence of minority shareholder expropriation. If the minority shareholders have greater voting power (relative to the largest shareholder), they may be able to reduce self-serving behaviour by the largest shareholder. Like the research on board independence, research examining relative minority shareholder power and minority shareholder expropriation has produced mixed results (e.g. Gao and Kling, 2008; Hughebaert and Wang, 2012).

One type of expropriation of minority shareholders is when the largest shareholder extracts resources from the company on terms that are favourable for the largest investor but potentially harmful to minority shareholders. The extraction of resources from companies by the largest shareholder is called "tunnelling" (e.g. Cheung *et al.*, 2006). Management may be unlikely to prevent this type of expropriation because the largest shareholder (through their voting control of the board) may control the management.

We propose that board independence and relative minority shareholder power may interact to influence the potential relationship between board independence and tunnelling. When minority ownership is low and widely dispersed, the minority shareholders have less ability to induce the independent directors to protect their interests,² so the independent directors may serve the interests of the largest shareholder rather than those of the minority shareholders. However, if minority shareholders own larger and more concentrated ownership stakes, they have both the incentive (based on their larger investments) and the ability (through their voting power) to induce the independent directors to protect their interests. We therefore expect that independent directors may be more effective at reducing tunnelling when there is greater concentration of ownership among the minority shareholders. This notion may also help to explain the mixed results in the previous literature on the relationship between board independence and tunnelling and relative

² Widely dispersed and small minority shareholders may also have less incentive to be actively engaged in governance activities as they could "vote with their feet" by disposing of their small ownership stakes, which are more readily sellable than those of larger shareholders, who could face price declines if they were to sell their large ownership stake.

minority shareholder power and tunnelling.

We obtain a sample of 13,579 firm-years among Chinese listed companies from 2004 to 2014. We find that the percentage of independent directors is positively related to tunnelling, suggesting that independent directors are more likely to serve the interests of the largest shareholder. We also find that greater minority shareholder power (measured as the percentage of shares owned by the second to tenth largest shareholders relative to the largest shareholder's ownership stake) is negatively related to tunnelling, suggesting that minority shareholders with more voting power can constrain the largest shareholder from engaging in tunnelling.

The interaction between relative minority shareholder power and board independence is negative, suggesting that independent directors may more effectively serve the interests of the minority shareholders when the minority shareholders have higher relative voting power. We also split the sample on the basis of the size of the minority shareholder's ownership stake. We find that board independence is positively related to tunnelling when the disclosed minority shareholder's stake is smaller. However, when the disclosed minority shareholders' ownership interests are larger, the sign on the percentage of independent directors variable flips and there is a negative relationship between board independence and tunnelling. These results suggest that independent directors serve either the interests of the largest shareholder or the interests of the minority shareholders depending on the relative ownership of these two types of shareholders but have difficulty in serving the divergent interests of both.

We contribute the literature in two important ways. We extend the literature on the relationship between relative minority shareholder power and tunnelling (e.g. Berkman *et al.*, 2009; Huyghebaert and Wang, 2012), and we expand the literature on the relationship between board independence and tunnelling (e.g. Gao and Kling, 2008; Shan, 2013) by examining the potential interactive effects between board independence and relative minority shareholder power on tunnelling. By so doing, we may help to explain the inconsistent results of previous studies on these topics.

II. Background Literature and Hypothesis Development

2.1 Tunnelling

Johnson *et al.* (2000) define tunnelling as the transfer of assets and/or profits out of firms for the largest shareholder's benefit. Tunnelling is a type of agency cost in which the largest shareholder and management collude to the detriment of the minority shareholders. Tunnelling is more likely when there is a large shareholder with a dominant ownership stake in the company who can exert strong influence on the company. Research indicates that large controlling shareholders exist in many companies around the world (e.g. La Porta *et al.*, 1999; Faccio and Lang, 2002; Franks and Mayer, 2001; Claessens *et al.*, 1999). These controlling shareholders could have the power to expropriate resources from the minority

shareholders through tunnelling (Pagano and Roell, 1998; Johnson *et al.*, 2000). Tunnelling has been found to be more prevalent in developing countries due to the weaker legal protection of minority shareholders and/or weaker corporate governance in emerging markets (e.g. Shleifer and Vishny, 1997; Liu and Lu, 2007; Li, 2010).

More dominant shareholders may increase the likelihood of tunnelling. Faccio *et al.* (2010) indicate that controlling shareholders may prefer a capital structure with more debt (i.e., higher leverage) because debt (in contrast to equity which has voting rights) will not dilute their control ability. Liu and Tian (2012) further find that companies may incur excess debt to generate resources that can then be tunneled to the largest shareholder.

Companies engaged in tunnelling may attempt to reduce or hide the adverse effects of tunnelling through the strategic use of accounting and earnings management. Liu and Lu (2007) point out that the controlling shareholders may manage their earnings to mask a firm's true performance. Fan and Wong (2002) also note that accounting policies can be adjusted to benefit the controlling shareholder, and Cullinan *et al.* (2012) find that companies with controlling shareholders may use less conservative accounting to mask potential expropriation of resources from minority shareholders.

2.2 Board Independence and Tunnelling

Independent directors are those who have no relationship with the company other than as directors: for example, they are not employees of the company. They are typically executives from other companies, retired executives, and/or academics. Because they do not work for company management, independent directors can be independent of management and can therefore promote the interests of shareholders by providing more effective oversight of management (e.g. Fama and Jensen, 1983; Bhagat *et al.*, 1987). These independent directors may also have a stronger focus on maintaining their business reputation, which can create incentives for them to show greater diligence in their role as directors (Fama and Jensen, 1983).

Board independence has been found to be associated with stronger firm performance (e.g. Liu *et al.*, 2015) and better board decision making (Weisbach, 1988; Peasnell *et al.*, 2005). For example, Weisbach (1988) finds that boards with greater independence are more likely to replace a poorly performing CEO, and Peasnell *et al.* (2005) note that board independence is associated with higher quality financial reporting. Booth *et al.* (2002) find that decision making may be enhanced by more independent boards because independent directors bring complementary knowledge from outside the company. Anderson and Reeb (2004) find that controlling shareholders (whose interests may conflict with those of minority shareholders) seek to limit the presence of independent directors, especially in family-controlled firms, suggesting that independent directors may limit the power of controlling shareholders.

Similar to Western governance practices, Chinese independent directors cannot be part

of management and cannot have a business relationship with the firm. Given the concentrated ownership structure in China and the need to balance interests among the shareholders, Chinese regulations add another requirement that “[i]ndependent directors shall be independent from...the company’s major shareholders” (CSRC, 2001a). Independence from the major shareholders is designed to enhance the likelihood that independent directors will protect the interests of minority shareholders. Consistent with this idea, Jiang and Kim (2015) note that the “primary and legally explicit requirement of independent directors [is] to monitor large controlling shareholders on behalf of minority shareholders.”³

One of the ways in which independent directors may protect minority shareholders is through preventing or limiting tunnelling (e.g. Shan, 2013). Previous research has found mixed results regarding the relationship between board independence and tunnelling among Chinese companies. Huyghebaert and Wang (2012) find no relationship between board independence and tunnelling except among state-controlled firms, where board independence is *positively* related to tunnelling. Other research, however, has found that tunnelling is *negatively* related to the percentage of independent directors (e.g. Gao and Kling, 2008; Qian and Zhou, 2012) or to the number of independent directors (Shan, 2013).

We also examine the relationship between board independence and tunnelling. Previous research has found that board independence is either positively related to tunnelling, negatively related to tunnelling, or not related to tunnelling. We therefore propose a non-directional (null) hypothesis as follows:

H1: There is no relationship between board independence and tunnelling.

2.3 Relative Minority Shareholder Power and Tunnelling

The presence of large shareholders (other than the largest shareholder) may inhibit the ability of the largest shareholder to expropriate resources from the minority shareholders (e.g. Huyghebaert and Wang, 2012). Chinese securities regulations recognise the value of a balance between the largest shareholder and other shareholders with the admonition for companies and their largest shareholders to “emphasise the establishment of a reasonably balanced shareholding structure” (CSRC, 2001a). More concentrated ownership among the minority shareholders (i.e. greater balance between the largest and minority shareholders) may give the minority shareholder greater incentive and ability to influence the company’s actions and thereby protect their own interests and those of other minority shareholders. Consistent with this notion, Jiang and Kim (2015) note the following:

“The ability of [other] large shareholders to sell their shares may represent an effective

³ Chinese securities regulations (CSRC, 2001b) specifically state that “independent directors shall...protect the overall interests of the company, and shall be especially concerned with protecting the interests of minority shareholders from being infringed.”

bargaining tool among large shareholders. For example, the largest shareholder will not want the second largest shareholder to sell his or her shares, as the block sale and the strong negative signal would lead to a very large stock price decline.”

This bargaining tool could limit the ability of the largest shareholder to expropriate the minority shareholders.

Empirical evidence on the relationship between relative minority shareholder power and tunnelling is mixed. Gao and Kling (2008) find no relationship between whether the second through fifth largest shareholders own more than the largest shareholder and the likelihood of tunnelling. However, Berkman *et al.* (2009) do find some limited evidence that larger shareholdings among the second to tenth shareholders⁴ are associated with a reduced likelihood of tunnelling. Huyghebaert and Wang (2012) find more consistent evidence that the relative size of the shareholdings of the second to tenth shareholders is negatively associated with tunnelling.

Relative minority shareholder power may enhance minority shareholder influence on the company and thereby help to reduce tunnelling behaviour, and there is some empirical support for this position. Consistent with most existing research, we therefore propose that relative minority shareholder power may be negatively associated with tunnelling and hypothesize as follows:

H2: Relative minority shareholder power is negatively related to tunnelling.

2.4 Interaction between Independent Directors and Relative Minority Shareholder Power

As mentioned previously, research has found mixed results on the relationship between board independence and tunnelling. These mixed results suggest that the board independence-tunnelling relationship may be contingent on some other factors related to tunnelling, perhaps including relative minority shareholder power.

Independent directors are elected by the shareholders and are supposed to help ensure that management acts in the shareholders’ interests (e.g. Bhagat *et al.*, 1987). However, it is possible that not all shareholders have the same interests, especially when there is a large shareholder who may be able to expropriate resources from the minority shareholders. If there is a conflict between the interests of the largest shareholder and those of the other shareholders, the independent directors may have to decide whose interests to support. Consistent with this notion, Cheung *et al.* (2011) find that corporate governance structures are less effective at protecting firm value when there is a concentrated ownership structure. Similarly, Prencipe and Bar-Yosef (2013) suggest that the effectiveness of independent directors is contingent upon ownership structure, with independent directors being less

⁴ The names and shareholdings of the 10 largest shareholders are disclosed in China.

effective in family-controlled companies.

If there is a large and dominant shareholder, company management may be willing to take actions (such as tunnelling) that are beneficial for the largest shareholder (who has a strong influence on the compensation and future employment of the executives) but which harm the interests of the minority shareholders. When ownership is more concentrated, boards may be less effective in limiting self-serving behaviour by the largest shareholder. Consistent with this notion, Chin *et al.* (2009, p. 145) note that “[t]ight control creates an entrenchment problem that allows controlling owners’ self-interested behavior to go unchallenged...by the boards of directors”. Independent directors may not object to the largest owner’s self-interested behaviour (such as tunnelling) if their position on the board depends on the support of the largest shareholder because the minority shareholders are widely dispersed. Liu *et al.* (2013) note that large shareholders minimise monitoring from independent directors, and this minimised monitoring may be more likely to occur if the minority shareholders have lower power relative to the largest shareholder.

However, if the minority shareholders have greater voting power, this voting power may influence the decisions of the independent directors, making them more likely to protect the interests of these minority shareholders by limiting tunnelling. We therefore expect that independent directors may be more effective at inhibiting tunnelling when the relative voting power of minority shareholders is higher. We therefore propose an interactive relationship between independent directors and relative minority shareholder power as follows:

H3: Independent directors are more effective at inhibiting tunnelling when relative minority shareholder power is higher.

2.5 Largest Shareholder Voting Power and Tunnelling

In addition to the relative voting power of the minority shareholders, the absolute voting power of the largest shareholder may also be related to the likelihood of tunnelling. The greater the ability of the largest shareholder to control the company, the more power the largest shareholder may have to extract resources from the company over which it has voting influence. We therefore propose the following hypothesis:

H4: There is a positive relationship between the voting power of the largest shareholder and tunnelling.

There may also be an interaction effect between the voting power of the largest shareholder and board independence. One possibility is that if the largest shareholder has greater voting power, board independence may not matter for reducing tunnelling as the

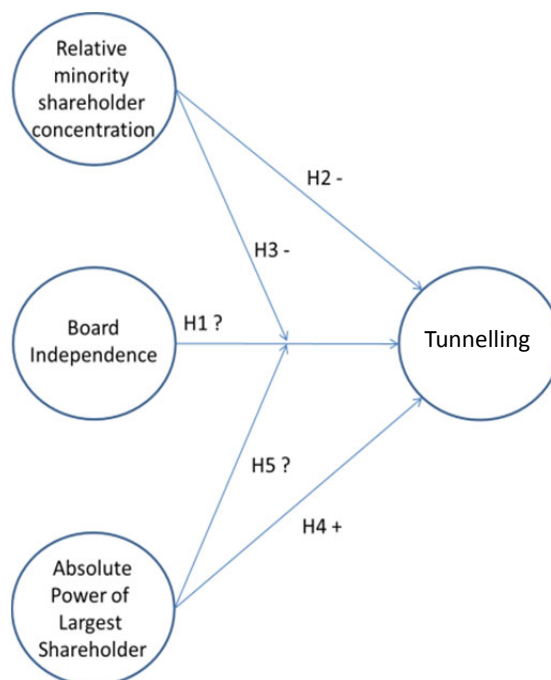
largest shareholder has a commanding and dominant position. Alternatively, the ability of the independent directors to voice their concerns about tunnelling at board meetings may serve to constrain behaviour. Because of the two possibilities, we pose the final hypothesis in the null form:

H5: There is no interactive relationship between the voting power of the largest shareholder and board independence on tunnelling.

2.6 Summary of Hypotheses

Our hypotheses are summarised in Figure 1. H1 examines whether there is a relationship between board independence and tunnelling. Given the mixed results of existing research, we do not propose a direction for this relationship. H2 posits that there is a negative relationship between relative minority shareholder power and tunnelling. H3 indicates that the interaction between relative minority shareholder power and the percentage of independent directors is expected to be negative, either adding to the main effect of the percentage of independent directors (if the main effect is negative) or offsetting the main effect of the percentage of independent directors (if the main effect is positive). H4 posits that greater voting power of the largest shareholder may be associated with more tunnelling, while H5 considers whether there is an interactive effect of the voting power of the largest shareholder and board independence on tunnelling.

Figure 1 Summary of Hypotheses



III. Research Methods

3.1 Sample

We gather data from Chinese A-share companies listed on the Main Board of the Shenzhen and Shanghai Stock Exchanges for 2004 to 2014. We obtain most of the data from the CSMAR database. We hand collect ownership data on the basis of cross and common ownership among the various owners from the Juchao website to ensure that we accurately measure the ultimate owner of the shares. Our sample is limited because of missing data (213 firm-year observations). We also remove firms in the financial services industry due to their distinctive characteristics (289 firm-years). Our sample includes 13,579 firm-years for Chinese companies from 2004 to 2014. Our sample creation process is summarised in Table 1.

Table 1 Sample selection

	Number of firm-year observations
A-share companies listed on the Main Board of Shenzhen and Shanghai Stock Exchanges from 2004 to 2014	15,048
<i>Less:</i>	
Observations for which the ultimate owner could not be identified	(967)
Observations with insufficient data of independent variables and other control variables	(213)
Observations from financial services	(289)
Final sample	13,579

3.2 Variable Measurements

3.2.1 Dependent variable

Consistent with Cheung *et al.* (2006), we consider transactions between the company and the largest shareholder in our measure of tunnelling. We include all of the following types of transactions in our tunnelling measure: (1) sales of assets and/or goods and services to the largest shareholder; (2) purchases of assets and/or goods and services from the largest shareholder; (3) direct cash payments and/or loan guarantees from the company to the largest shareholder; and (4) sales of equity securities to the largest shareholder. Our tunnelling variable sums each of these measures and scales the total by company size (based on assets). Table 2 provides details on the individual connected party transactions we include in our tunnelling measure.

Table 2 Connected Transactions Included in Tunnelling Variable

Types of transaction	Transaction direction	Items in the CSMAR database	Description
Asset acquisitions	Purchasing	Repat=02(tangible asset) Repat=19 (intangible asset)	Transactions that involve the acquisition of tangible or intangible assets by the listed company from a connected person or from a private company majority-controlled by this person.
Asset sales	Selling	Repat=02(tangible asset) Repat=19 (intangible asset)	Transactions that involve the sale of tangible or intangible assets by the listed company to a connected person or to a private company majority-controlled by this person.
Trading relationship	Purchasing /Selling	Repat=01(goods trading) Repat=03(services trading)	Transactions that involve the trade of goods and services between the listed company and a private company majority-controlled by a connected person. They can be purchases by the listed company or sales or both.
Cash payments	Selling	Repat=05(part of this item, including funds provision or occupation, loan, cash assistance) Repat=06(guarantee provision)	Transactions that involve direct cash payments by the listed company to a connected person or to a company controlled by this person or to a subsidiary (including loans and cash assistance) and the provision of cash guarantees by the listed company for debts owed by the connected person or by the companies controlled by this person.
Equity sales	Selling	Repat=13 (equity transfer)	Transactions that involve the sale of equity stake in the listed company to a connected person or a private company majority-controlled by this person.

$$\text{TUNNELLING} = \Sigma(\text{AMOUNT OF EACH TYPE OF TRANSACTION}) / \text{ASSETS}$$

3.2.2 Hypothesised independent variables

To test H1, we measure the percentage of independent directors (*INDP*) on the board of directors. *INDP* is calculated as the number of independent directors on the board divided by the total number of directors on the board. We measure relative minority shareholder power (used to test H2) on the basis of the holdings of the second to tenth largest shareholders divided by the holdings of the largest shareholder (*CSTR*). At higher levels of *CSTR*, the minority shareholders have greater potential to influence the actions of the company. To ensure clean measurements of shareholding levels, we combined share ownership among different shareholders when there is cross/common ownership of shares among the largest shareholder and/or other disclosed shareholders.⁵ This procedure

⁵ Fan and Wong (2002) find that controlling shareholders in East Asian markets often have enhanced control of listed companies through pyramid ownership structures and cross-holdings.

sometimes results in the largest *disclosed* shareholder not being the largest *actual* shareholder because two (or more) of the other disclosed shareholders are under common control.⁶ In all cases, we base our measure of the largest shareholder on the actual largest shareholder, which may differ from the largest disclosed shareholder. To test H3, we interact the relative minority shareholder power variable (*CSTR*) with the percentage of independent directors variable (*INDP*).

We also include two measures of the absolute voting power of the largest shareholder. The dichotomous variable *HDOM* takes the value of 1 if the largest shareholder controls more than 50% of the voting rights over the company and 0 otherwise. When *HDOM* = 1, the largest shareholder can control the actions of the company through their ability to elect a majority of the board of directors. We thus expect a positive relationship between *HDOM* and tunnelling. We also code an *LDOM* variable, which takes the value of 1 if the largest shareholder has less than 30% of the voting rights over the company. We base the 30% cut-off on regulations of the China Securities Regulatory Commission (CSRC), which consider shareholders owning at least 30% to have a greater ability to harm the interests of minority shareholders. We expect tunnelling to be less prevalent among companies with *LDOM* = 1. For both the *HDOM* and *LDOM* measures, we consider control rights, which may differ from cash-flow rights due to cross/common ownership.

3.2.3 Control variables

We include the cash-flow rights of the largest shareholder relative to their voting rights (*CVR*) as a control variable.⁷ Tunnelling behaviour can adversely affect firm value (e.g. Cheung *et al.*, 2006; Jiang *et al.*, 2010; Du *et al.*, 2013), harming the minority shareholders. However, as fellow shareholders of the business, the largest shareholder engaging in tunnelling would also be adversely affected by the decline in firm value brought about by tunnelling. The largest shareholder will therefore be balancing the direct benefits they obtain through tunnelling with the indirect cost they may incur through decreased share value. We therefore expect that largest shareholders with higher cash-flow rights will be less likely to engage in tunnelling, which may not be cost beneficial to the largest shareholder if they have to absorb more of the cost of the tunnelling. We also control for whether the company's shares are held in a pyramid-type structure (Peng and Jiang, 2010) that can magnify the power of large shareholders.

Because state-related firms may have different incentives than other firms, we include a

⁶ This procedure also results in some cases in which there are less than nine other shareholders included in the minority shareholder concentration calculation due to the cross/common ownership.

⁷ Cash flow rights may differ from voting rights. Consider, for example, a situation in which Company B owns 51% of the shares of Company C. Company B therefore exercises effective control over Company C. If Company A owns 51% of Company B, Company A controls Company B, which controls company C. Effectively, A has 51% control of C. However, if Company C paid dividends, Company A's would receive only 26.01% of the dividends (i.e. 51% A's ownership in B * 51% B's ownership in C), making the cash flow rights 26.01%.

dummy variable (*SOE*) indicating whether the largest owner is state related (coded as 1) or not (coded as 0).⁸ Consistent with most other research on tunnelling, we include firm size (log of assets) and the ratio of debt to assets (*LEV*) as control variables. Faccio *et al.* (2010) suggest that higher leverage can increase the power of the largest shareholder because debtors (as opposed to investors) generally do not have voting rights. Finally, we include 10 year dummy variables and 16 industry dummy variables. To control for potential outliers, all of the continuous variables are winsorised at 1% and 99%.⁹ A summary of all of these variables and their measurements is presented in Table 3.

Table 3 Variable Definitions

Variable Code	Description	Data Source
Dependent variable		
<i>TUNL</i>	Transactions with the largest shareholder /Assets at the end of fiscal year (based on Cheung <i>et al.</i> , 2006).	CSMAR Database
Independent variables		
<i>INDP</i>	Percentage of independent directors served on the board.	CSMAR Database
<i>CSTR</i>	The ratio of non-controlling shareholding within the top 10 big shareholders to the largest shareholding, calculated as: $\frac{\text{The aggregate percentages of shares held by the other large shareholders}}{\text{The percentage of shares held by the largest shareholder}}$	Manually coded
<i>HDOM</i>	Dummy variable, coded 1 if the voting rights of the largest shareholder are larger than 50% and 0 otherwise.	Manually coded
<i>LDOM</i>	Dummy variable, coded 1 if the voting rights of the largest shareholder are less than 30% and 0 otherwise.	Manually coded
Control variables		
<i>CVR</i>	The discrepancy of ultimate owner's voting rights and cash flow rights, calculated as $CVR = (\text{Voting right} - \text{Cash flow right}) / \text{Voting right}$	Manually coded
<i>PYRD</i>	Dummy variable, coded 1 if the companies with the pyramid structure and 0 otherwise (Peng and Jiang, 2010).	Manually coded
<i>SOE</i>	Dummy variable, equal to 1 if the ultimate owner is the government and 0 otherwise.	Manually coded
<i>SIZE</i>	The logarithm of total assets at the end of fiscal year.	CSMAR
<i>LEV</i>	Debt divided by total assets.	CSMAR
<i>YEAR_i</i>	Dummy variable ($i=2004\sim 2014$), coded 1 if the observation is in year j and 0 otherwise.	CSMAR
<i>INDU_i</i>	Dummy variables ($j=1\sim 17$). Choosing the manufacture industry as the base group, coded 1 if the company is the industry j and 0 otherwise.	CSMAR

⁸ As with the ownership variables, the determination of the largest owner for coding the *SOE* variable is based on the actual largest shareholder, which may differ from the disclosed largest shareholder due to cross/common ownership.

⁹ All main results are robust with respect to cross-sectional winsorisation each year and to no winsorisation.

3.3 Testing Techniques

To test H2 and H4, we estimate an OLS regression model with tunnelling as the dependent variable and relative minority shareholder power (*CSTR*) (to test H2), *HDOM* and *LDOM* (to test H4), and the control variables as the independent variables. To test H1, we add the percentage of independent directors (*INDP*). We test H3 and H5 by adding to our tunnelling model (1) the interaction between board independence (*INDP*) and relative minority shareholder power (*CSTR*) (to test H3) and (2) the interactions between *LDOM* and *HDOM* and board independence and the three-way interactions of *INDP***CSTR***HDOM* and *INDP***CSTR***LDOM* (to test H5).

IV. Results

4.1 Descriptive Statistics

Panel A of Table 4 presents the descriptive statistics for the firms in our sample. For the mean company, the tunnelling variable (*TUNL*) indicates that tunnelling averages 9% of assets, with a maximum of 153.7% of assets and a minimum of no tunnelling. *CSTR* averages 0.523, indicating that the second to tenth largest shareholders together hold an average of 52.3% of the number of shares held by the largest shareholder. Independent directors comprise 36.2% of the directors at the average company (*INDP*), with some companies having up to 80% of their board comprised of independent directors. For 29.2% of the firm-years in our sample, the largest shareholder controls more than 50% of the voting power (*HDOM*), and for 34.8% of the firm-years in our sample, the largest shareholder controls less than 30% of the voting power over the company (*LDOM*).

Cash-flow rights relative to voting rights (*CVR*) average 16.5%, with a maximum of 87.7%, and 93.9% of the firm-years having a pyramid ownership structure. A state-related enterprise is the largest owner of 68.3% of the firm-years, and the mean log of company size is 21.82. Debt averages 55.0% of assets among the firms in our sample (*LEV*).

Panels B, C, and D of Table 4 present the descriptive statistics categorised into the three levels of voting power of the largest shareholder. When the largest shareholder has more than 50% voting power, tunnelling has a mean of 0.140. For firm-years in which the largest shareholder has between 30% and 50% voting power, tunnelling averages 0.084. For firm-years in which the largest shareholder has the smallest degree of voting power (<30%), tunnelling is also smallest, with a mean of 0.063. The differences in means among the three levels of voting control are all significant at $P < 0.01$ and are consistent with H4, which posits that tunnelling is likely to be higher when the largest shareholder has a higher degree of voting power.

Table 4 Descriptive Statistics**Panel A Full Sample**

Variable	N	Min	Mean	p50	Max	sd
<i>TUNL</i>	13579	0	0.09	0.01	1.537	0.231
<i>CSTR</i>	13579	0.017	0.523	0.332	2.429	0.517
<i>INDP</i>	13579	0	0.362	0.333	0.800	0.054
<i>HDOM</i>	13579	0	0.292	0	1	0.455
<i>LDOM</i>	13579	0	0.348	0	1	0.476
<i>CVR</i>	13579	0	0.165	0	0.877	0.246
<i>PYRD</i>	13579	0	0.939	1	1	0.240
<i>SOE</i>	13579	0	0.683	1	1	0.465
<i>SIZE</i>	13579	18.62	21.82	21.72	25.79	1.361
<i>LEV</i>	13579	0.081	0.550	0.538	2.004	0.267

Panel B High Voting Power: Largest Shareholder Voting Rights > 50% (*HDOM* = 1)

Variable	N	Min	Mean	p50	Max	sd
<i>TUNL</i>	3967	0	0.140	0.0244	1.537	0.280
<i>CSTR</i>	3967	0.017	0.167	0.122	0.998	0.150
<i>INDP</i>	3967	0	0.364	0.333	0.800	0.059
<i>CVR</i>	3967	0	0.130	0	0.877	0.214
<i>PYRD</i>	3967	0	0.952	1	1	0.215
<i>SOE</i>	3967	0	0.811	1	1	0.391
<i>SIZE</i>	3967	18.62	22.40	22.24	25.79	1.447
<i>LEV</i>	3967	0.081	0.519	0.526	2.004	0.213

Panel C Medium Voting Power: Largest Shareholder Voting Rights between 30% and 50%

Variable	N	Min	Mean	p50	Max	sd
<i>TUNL</i>	4893	0	0.084	0.011	1.537	0.207
<i>CSTR</i>	4893	0.017	0.412	0.320	2.313	0.328
<i>INDP</i>	4893	0	0.359	0.333	0.667	0.0501
<i>CVR</i>	4893	0	0.153	0	0.877	0.237
<i>PYRD</i>	4893	0	0.939	1	1	0.240
<i>SOE</i>	4893	0	0.746	1	1	0.436
<i>SIZE</i>	4893	18.62	21.88	21.79	25.79	1.209
<i>LEV</i>	4893	0.081	0.536	0.536	2.004	0.220

Panel D Low Voting Power: Largest Shareholder Voting Rights < 30% (*LDOM* = 1)

Variable	N	Min	Mean	p50	Max	sd
<i>TUNL</i>	4719	0	0.063	0	1.537	0.201
<i>CSTR</i>	4719	0.039	0.938	0.850	2.429	0.589
<i>INDP</i>	4719	0	0.363	0.333	0.714	0.054
<i>CVR</i>	4719	0	0.207	0.014	0.877	0.273
<i>PYRD</i>	4719	0	0.927	1	1	0.260
<i>SOE</i>	4719	0	0.510	1	1	0.500
<i>SIZE</i>	4719	18.62	21.27	21.27	25.79	1.212
<i>LEV</i>	4719	0.081	0.591	0.553	2.004	0.338

Mean difference of tunnelling between **high power of controlling shareholder** and **medium power of controlling shareholder** is significant (mean difference=0.056, t-value=10.77***).

Mean difference of tunnelling between **medium power of controlling shareholder** and **low power of controlling shareholder** is significant (mean difference=0.021, t-value=5.08***).

Mean difference of tunnelling between **high power of controlling shareholder** and **low power of controlling shareholder** is significant (mean difference=0.077, t-value=14.87***).

4.2 Regression Results

Table 5 presents the results of our main OLS regression models. Column 1 tests H2 and H4. The results for the *CSTR*¹⁰ variable are consistent with our expectations in H2: relative minority shareholder power is negatively related to tunnelling. These results suggest that when the disclosed minority shareholders have greater relative voting power, tunnelling is less likely to occur. The *HDOM* variable is significantly positive, consistent with H4, which suggests that when the majority shareholder is in a more dominant position, tunnelling is more likely.

Table 5 Regression Results Examining the Relationships between Minority Ownership Concentration, Board Independence, and Tunnelling – Full sample used for all models

VARIABLE	Column 1	Column 2	Column 3
<i>CSTR</i>	-0.018*** (-3.703)	-0.018*** (-3.614)	-0.019*** (-3.886)
<i>INDP</i>		-0.141*** (-3.632)	-0.304*** (-4.936)
<i>HDOM</i>	0.055*** (10.708)	0.056*** (10.876)	0.056*** (10.859)
<i>LDOM</i>	-0.008 (-1.549)	-0.008 (-1.498)	-0.007 (-1.269)
<i>INDP</i> × <i>CSTR</i>			-0.331** (-2.141)
<i>INDP</i> × <i>HDOM</i>			-0.390** (-2.168)
<i>INDP</i> × <i>LDOM</i>			0.169 (1.564)
<i>INDP</i> × <i>CSTR</i> × <i>HDOM</i>			-1.224** (-2.499)
<i>INDP</i> × <i>CSTR</i> × <i>LDOM</i>			0.251 (0.994)
<i>CVR</i>	0.054*** (6.337)	0.053*** (6.218)	0.051*** (6.041)
<i>PYRD</i>	0.040*** (4.793)	0.039*** (4.742)	0.039*** (4.708)
<i>SOE</i>	0.048*** (10.176)	0.047*** (9.996)	0.047*** (9.932)
<i>SIZE</i>	-0.004** (-2.241)	-0.004** (-2.129)	-0.003* (-1.744)
<i>LEV</i>	0.042*** (5.595)	0.042*** (5.680)	0.041*** (5.580)
Constant	0.014 (0.372)	0.060 (1.475)	0.108** (2.454)
Observations	13579	13579	13579
R ²	0.056	0.056	0.057

Note: *, **, and *** denote statistically significant at 0.10, 0.05, and 0.01 levels, respectively, in a two-tailed test.

¹⁰ Results when using a dummy variable to measure whether the second to tenth largest shareholders own at least as many shares as the largest shareholder (untabulated) are materially consistent with the results presented for the *CSTR* variables for all of our analyses.

Column 2 of Table 5 presents the results of our testing of H1, examining the relationship between board independence and tunnelling. We find a negative relationship between board independence and tunnelling. Our results are consistent with H1 and with the negative board independence-tunnelling relationship found by Gao and Kling (2008) and Qian and Zhou (2012). This result suggests that independent directors may help to protect the interests of minority shareholders.

Column 3 presents the regression model of tunnelling incorporating the various interaction variables to test H3 and H5. The $INDP*CSTR$ interaction variable is negatively associated with tunnelling. These results are consistent with H3 and suggest that independent directors may be more effective at limiting tunnelling when the minority shareholders have more voting power. The $INDP*HDOM$ variable is significantly negative. These results shed light on H5 and indicate that, even when the largest shareholder holds a controlling voting position, independent directors may help to reduce tunnelling. The $INDP*CSTR*HDOM$ variable is also significantly negative, consistent with the notion that independent directors may be more effective at inhibiting tunnelling when the minority shareholders have more concentrated voting power even when the largest shareholder has control of the company. Neither of the interaction variables including $LDOM$ are significant, suggesting that independent directors are not incrementally effective at preventing tunnelling among companies in which the largest shareholder has less than 30% voting power, perhaps because tunnelling is less prevalent among these companies.

With regard to the control variables, CVR and $PYRD$ are positively associated with tunnelling, suggesting that companies that may use pyramid ownership structures to enhance their control may be more likely to engage in tunnelling. These results suggest that if the largest shareholder will incur less of the cost of tunnelling (through decreased share value, etc.), tunnelling may be more likely. The positive and significant coefficient on SOE indicates that tunnelling may be more common among state-owned enterprises. The size variable is negatively associated with tunnelling, suggesting that smaller firms are more likely to experience tunnelling. Consistent with Faccio *et al.*'s (2010) theory that higher leverage gives the largest shareholder more power, LEV is positively associated with tunnelling.

4.3 Supplemental Analysis

To further analyse the three-way interactive relationship between the voting power of the largest shareholder, minority shareholder concentration, board independence, and tunnelling, we break the sample down into three subsamples: higher voting power (>50% voting power held by the largest shareholder), medium voting power (voting power held by the largest shareholder between 30% and 50%), and lower voting power (<30% voting power held by the largest shareholder). We then divide these three subsamples according to whether the $CSTR$ is above or below the median level. The results of this testing are

presented in Table 6. The High control model results indicate that independent directors may be effective at inhibiting tunnelling among firms with a dominant shareholder only when minority shareholding is highly concentrated (high *CSTR*). Independent directors appear to be useful in limiting tunnelling among companies with medium voting power (Middle control), regardless of the level of *CSTR*. Independent directors do not appear to be effective in reducing tunnelling among firms in which the largest shareholder holds a smaller degree of voting control (Low control), perhaps because tunnelling is less common among these companies.

Table 6 Regression Results Examining the Relationship between Board Independence and Tunnelling for Subsamples Based on the Level of Controlling Shareholders Power and Level of *CSTR*

	High Control		Middle Control		Low Control	
	High <i>CSTR</i>	Low <i>CSTR</i>	High <i>CSTR</i>	Low <i>CSTR</i>	High <i>CSTR</i>	Low <i>CSTR</i>
<i>INDP</i>	-0.306*** (-2.770)	-0.073 (-0.605)	-0.207** (-2.496)	-0.324*** (-3.339)	-0.007 (-0.090)	-0.080 (-0.912)
<i>CVR</i>	0.099*** (3.463)	0.117*** (3.674)	0.069*** (4.056)	0.070*** (3.353)	0.045*** (3.187)	0.006 (0.313)
<i>PYRD</i>	0.086*** (3.501)	-0.009 (-0.267)	0.019 (1.274)	0.053** (2.374)	0.021 (1.510)	0.053*** (2.707)
<i>SOE</i>	0.103*** (6.378)	0.096*** (5.196)	0.063*** (6.726)	0.006 (0.539)	0.031*** (3.655)	0.047*** (4.725)
<i>SIZE</i>	-0.006 (-1.342)	0.017*** (3.242)	-0.001 (-0.376)	-0.003 (-0.677)	-0.008** (-2.251)	-0.019*** (-4.474)
<i>LEV</i>	0.094*** (3.306)	0.079** (2.391)	-0.016 (-0.906)	-0.014 (-0.631)	0.055*** (5.076)	0.029** (2.015)
Const.	0.065 (0.492)	-0.383*** (-3.023)	0.115 (1.368)	0.123 (1.133)	0.076 (0.917)	0.305*** (2.992)
Obs.	1984	1983	2446	2447	2360	2359
R ²	0.112	0.098	0.038	0.019	0.037	0.045

4.4 Robustness Analysis

In this section of the paper, we consider different measures and time periods to assess the robustness of our results. China implemented a share reform in 2006. The China Securities Regulatory Commission issued split-share reforms in 2006 to convert non-tradable shares into tradable shares. Before the reform, about 70% of listed firms' outstanding shares were non-tradable and mainly held by controlling shareholders and other blockholders. We split our sample into observations before and after this date. The results (presented in Table 7) indicate that our findings regarding the potential role of board

independence relate mainly to the post-share-reform period.

Table 7 Before and After the Share Trading Reform of 2006
Independent variable: *TUNL*

VARIABLE	Year<2006	Year>2007
<i>CSTR</i>	-0.005 (-0.369)	-0.020*** (-3.196)
<i>INDP</i>	-0.033 (-0.145)	-0.322*** (-4.811)
<i>HDOM</i>	0.057*** (4.834)	0.057*** (8.852)
<i>LDOM</i>	-0.022 (-1.528)	-0.007 (-1.011)
<i>INDP</i> × <i>CSTR</i>	0.598 (1.071)	-0.402** (-2.076)
<i>INDP</i> × <i>HDOM</i>	0.091 (0.267)	0.132 (1.028)
<i>INDP</i> × <i>LDOM</i>	0.468 (0.989)	-0.383** (-2.085)
<i>INDP</i> × <i>CSTR</i> × <i>HDOM</i>	0.357 (0.550)	0.357 (1.119)
<i>INDP</i> × <i>CSTR</i> × <i>LDOM</i>	1.292 (1.024)	-1.615*** (-2.752)
<i>CVR</i>	0.015 (0.801)	0.061*** (5.678)
<i>PYRD</i>	0.024 (1.545)	0.051*** (4.597)
<i>SOE</i>	0.028** (2.390)	0.052*** (9.006)
<i>SIZE</i>	0.024*** (4.966)	-0.010*** (-4.945)
<i>LEV</i>	0.006 (0.322)	0.052*** (5.352)
Constant	-0.505*** (-3.893)	0.277*** (5.301)
Observations	2374	8830
R ²	0.067	0.060

Note: *, **, and *** denote statistically significant at 0.10, 0.05, and 0.01 levels, respectively, in a two-tailed test.

We also create a dichotomous variable for *INDP* (*INDPD*) which takes the value of 1 if

the company exceeds the minimum required percentage of independent directors (1/3) and 0 otherwise. The results are presented in Table 8 and are broadly consistent with our main results: *CSTR*, *INCDP*, *INDPD***CSTR*, *INDPD***HDOM*, and *INDPD***CSTR***HDOM* are all negatively related to tunnelling. We also redefine our *CSTR* variable to consider the shareholdings of only the second-largest shareholder (*CSTR2*). The results (presented in Table 9) are broadly consistent with our earlier results, although the significance levels are lower for the *CSTR2* variables (and their interactions). These lower significance levels suggest that the use of the *CSTR* based on the second to tenth largest shareholders may be more appropriate.

Table 8 Regression Results Using Dichotomous Board Independence Variable
INDPD = 1 if *INDP* > 1/3 and 0 otherwise

VARIABLE	Column 1	Column 2	Column 3
<i>CSTR</i>	-0.018*** (-3.703)	-0.018*** (-3.625)	-0.018*** (-3.617)
<i>INDPD</i>		-0.007* (-1.650)	-0.027*** (-4.088)
<i>HDOM</i>	0.055*** (10.708)	0.055*** (10.747)	0.055*** (10.800)
<i>LDOM</i>	-0.008 (-1.549)	-0.008 (-1.535)	-0.008 (-1.455)
<i>INDPD</i> × <i>CSTR</i>			-0.061*** (-3.734)
<i>INDPD</i> × <i>HDOM</i>			-0.053*** (-2.691)
<i>INDPD</i> × <i>LDOM</i>			0.028*** (2.617)
<i>INDPD</i> × <i>CSTR</i> × <i>HDOM</i>			-0.214*** (-4.098)
<i>INDPD</i> × <i>CSTR</i> × <i>LDOM</i>			-0.012 (-0.530)
<i>CVR</i>	0.054*** (6.337)	0.053*** (6.266)	0.051*** (6.075)
<i>PYRD</i>	0.040*** (4.793)	0.040*** (4.777)	0.040*** (4.825)
<i>SOE</i>	0.048*** (10.176)	0.048*** (10.115)	0.048*** (10.070)
<i>SIZE</i>	-0.004** (-2.241)	-0.004** (-2.141)	-0.003** (-2.028)
<i>LEV</i>	0.042*** (5.595)	0.042*** (5.651)	0.043*** (5.720)
Constant	0.014 (0.372)	0.014 (0.354)	0.018 (0.460)
Observations	13579	13579	13579
R ²	0.056	0.056	0.057

Note: *, **, and *** denote statistically significant at 0.10, 0.05, and 0.01 levels, respectively, in a two-tailed test.

Table 9 *CSTR2* substituted for *CSTR*
CSTR2 is the ownership of the second-largest shareholder relative to the largest shareholder

VARIABLE	Column 1	Column 2	Column 3
<i>CSTR2</i>	-0.023*** (-2.589)	-0.022** (-2.504)	-0.021** (-2.395)
<i>INDP</i>		-0.142*** (-3.663)	-0.194*** (-4.387)
<i>HDOM</i>	0.057*** (11.255)	0.058*** (11.421)	0.059*** (11.592)
<i>LDOM</i>	-0.014*** (-2.728)	-0.014*** (-2.653)	-0.013*** (-2.590)
<i>INDP</i> × <i>CSTR2</i>			-0.495*** (-2.639)
<i>INDP</i> × <i>HDOM</i>			-0.102 (-0.922)
<i>INDP</i> × <i>LDOM</i>			0.252** (2.512)
<i>INDP</i> × <i>CSTR2</i> × <i>HDOM</i>			-0.934* (-1.725)
<i>INDP</i> × <i>CSTR2</i> × <i>LDOM</i>			0.238 (0.611)
<i>CVR</i>	0.054*** (6.368)	0.053*** (6.246)	0.052*** (6.086)
<i>PYRD</i>	0.041*** (5.009)	0.041*** (4.953)	0.041*** (4.961)
<i>SOE</i>	0.049*** (10.282)	0.048*** (10.100)	0.047*** (10.022)
<i>SIZE</i>	-0.004** (-2.400)	-0.004** (-2.285)	-0.003** (-1.975)
<i>LEV</i>	0.041*** (5.548)	0.042*** (5.636)	0.042*** (5.643)
Constant	0.016 (0.403)	0.062 (1.513)	0.068* (1.649)
Observations	13579	13579	13579
R ²	0.055	0.056	0.057

Note: *, **, and *** denote statistically significant at 0.10, 0.05, and 0.01 levels, respectively, in a two-tailed test.

Institutional investors may have greater influence over company decisions and therefore may be effective at inhibiting tunnelling. We run the model presented in Table 5 substituting the size of institutional shareholding (relative to the holding of the largest shareholder). The results (untabulated) are largely consistent with the results presented in Table 5, except the institutional shareholder variable is less significant in most cases than the

CSTR variable was in the results presented earlier. These results suggest that the results are driven by the large minority shareholder, regardless of whether the minority shareholders are institutions or not.

Our final robustness analysis is based on a two-stage model in which board independence is the predicted variable in the first stage analysis. The results of the two-stage analysis are presented in Table 10. Consistent with our other results, *CSTR* is negatively related to tunnelling and *HDOM* is positively related to tunnelling.

Table 10 Two-Stage Model to Control for Possible Endogeneity of Board Independence

	Full sample <i>INDP</i> First stage	Full sample <i>TUNL</i> Second stage
<i>CSTR</i>	0.001 (1.13)	-0.180*** (-3.24)
<i>INDP</i>		-0.016*** (-3.17)
<i>INDU.INDP</i>	0.679*** (10.06)	
<i>L.INDP</i>	0.685*** (110.60)	
<i>HDOM</i>	0.002** (2.23)	0.059*** (11.25)
<i>LDOM</i>	0.001 (0.80)	-0.00875 (-1.57)
<i>CVR</i>	-0.003** (-2.20)	0.053*** (6.16)
<i>PYRD</i>	-0.001 (-0.93)	0.038*** (4.42)
<i>SOE</i>	-0.002** (-2.39)	0.045*** (9.36)
<i>SIZE</i>	0.000 (0.25)	-0.004** (-2.06)
<i>LEV</i>	0.002* (1.67)	0.042*** (5.56)
Constant	-0.118*** (-4.85)	0.072 (1.62)
Observations	13237	13237
R-squared	0.515	0.058
Score chi2(1)	0.361 (p=0.548)	
Durbin chi2(1)	0.606 (p=0.436)	
Wu-Hausman F(1,13200)	0.604 (p=0.437)	

4.5 Limitations

Our study is subject to a number of limitations. First, our measure of *TUNL* may not capture all types of tunnelling or may overestimate the amount of tunnelling if the related party transactions with the largest shareholder are conducted on terms similar to arms-length transactions. Second, we do not have measures of the detailed backgrounds of the independent directors, which may have revealed relationships with the largest shareholder or with the minority shareholders that may have influenced our results. Finally, while we attempted to control for other variables that may influence tunnelling, there may be other variables associated with tunnelling that we have not captured which might have influenced our results.

V. Summary and Conclusions

Research has found inconsistent results when examining the relationship between board independence and tunnelling. We propose that while independent directors are supposed to protect shareholders' interests, these interests may not be the same among all shareholders. The interests of different types of shareholders may be more likely to diverge when there is a large shareholder who may be in a position to harm the interests of the other (minority) shareholders. These differing interests may help to explain the inconsistent results found in previous literature. Board independence may influence the extent of tunnelling experienced by an organisation. However, given the potential conflict between the interests of different types of shareholders, the direction of this relationship is not clear. The board independence-tunnelling relationship may be positive (if the independent directors are serving the interests of the largest shareholder) or negative (if the independent directors are serving the interests of the minority shareholders).

A very limited body of research has examined the relationship between the share ownership of minority shareholders and the likelihood that the largest shareholder may expropriate resources from the minority shareholders through tunnelling. We propose that if the ownership interests of the minority shareholders are more concentrated, they will be in a better position to defend their interests than if the minority ownership were more dispersed. The more concentrated ownership position can give the minority shareholders more influence over the company's affairs which might allow the minority shareholders to limit tunnelling. We thus expect that relative minority shareholder power is negatively related to tunnelling.

Combining these perspectives on board independence and minority ownership concentration, we also propose that there may be an interactive effect of board independence and relative minority shareholder power on tunnelling. Independent directors of companies with greater minority shareholdings (relative to the largest shareholder) may be more vulnerable to the voting power of these minority shareholders and thus may be more likely

to protect the minority shareholders by limiting tunnelling by the largest shareholder.

We use a sample of 13,579 firm-years of Chinese firms from 2004 to 2014 to test these ideas. We find a positive relationship between board independence and tunnelling, suggesting that independent directors may serve the interests of the largest shareholder, even when these interests may harm the interests of the minority shareholders. Consistent with the greater influence of minority shareholders when ownership is more concentrated, our results indicate a negative relationship between relative minority shareholder power and tunnelling. We also find that the interaction between board independence and relative minority shareholder power is negatively related to tunnelling. This result suggests that independent directors may be more likely to protect the minority shareholders' interests when the minority shareholders have greater voting power.

Overall, our results suggest that the role of independent directors is more complex when there is a large shareholder who may dominate the company (as is common in China and other Asian countries) rather than when ownership is widely dispersed (as is more common in the US). When there is a large shareholder, the bigger threat to the shareholders may not come from self-serving behaviour by management (as in traditional agency theory) but from a divergence of interests between the largest shareholder (who may control management) and the interests of minority shareholders. In such a context, the independent directors may not effectively serve the interests of the minority shareholders, particularly if the largest shareholder has a more dominant position and minority shareholdings are more widely dispersed.

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