

# Extraction of Private Benefits of Control by Families: Tunnelling and Trading in a Private Information Environment

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## Abstract

Using a sample of Hong Kong listed companies we investigate how private benefits of control are extracted by a family via tunnelling and trading in shares. We find that family ownership is associated with entrenchment/liquidity-using effects, leading to tunnelling and trading by families. Family board overrepresentation is associated with entrenchment/liquidity-restricting effects, facilitating tunnelling but limiting market scrutiny via informed trading. Family board leadership leads to monitoring/liquidity-promoting effects that prevent tunnelling and promote the price discovery process. These effects differ between founder- and heir-families. Tunnelling and trading are two independent mechanisms of rent extraction even after controlling for endogeneity.

**Keywords:** Family control, tunnelling, informed trading

JEL Classification G3, L2, K2

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## Abstract

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## 1. Introduction

Modern corporate finance research has widely accepted that family owners represent the most common category of large, undiversified shareholders, especially in emerging economies (Bebchuk and Weisbach, 2010).

However, how large family shareholders exploit private information to extract their specific rents remains relatively unexplored. Private benefits of control are usually assumed to be part of the opaque information environment, which stimulates private information risk faced by uninformed investors (Easley, Hvidkjaer, and O'Hara, 2002). The first and second order extraction of the private benefits of control can be captured by two important characteristics of the private information environment: the existence of private information and the structure of trade, where the structure of trade is defined as the intensity of informed over uninformed trade in the stock market. The existence of private information often provide a basis for tunnelling by managers or controlling shareholders which takes many forms, including self-dealing transactions, transfer pricing, private appropriation of corporate opportunities, self-serving financial deals such as directed equity issuance or personal loans to insiders, and outright theft of corporate assets to divert wealth from uninformed investors to themselves (Shleifer and Vishny, 1997a; Johnson, La Porta, Lopez-de-Silanes, and Shleifer, 2000). Given the existence of private information, there is a second-order wealth re-distribution from uninformed investors to informed investors, when informed investors take or tap the liquidity of uninformed trade in the stock market (O'Hara, 1995). The second-order extraction of private benefits of control via trading can be revealed in the structure of trade. Although both types of private benefits are related to the existence of private information in the market, there is very little research on how they are jointly affected by the firm-level governance factors.

Using market microstructure modelling, we investigate the impact of controlling families on the first-order extraction of private benefits of control via tunnelling captured by the existence of private information, and the second-order extraction of private benefits of control via trading captured by the structure of trade. Previous literature on the private benefits of control focus either on one specific type of tunnelling<sup>2</sup>, or on trading separately<sup>3</sup>. Different forms of private benefits of control can co-exist and/or can substitute each other (Atanasov, Black, Ciccotello, Gyoshev, 2010), and thus focusing on either form without considering the overall process can misrepresent the controlling shareholders' true impact. We consider the extraction of the private benefits of control via tunnelling and trading jointly. This recognises the different incentives for families facing

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<sup>2</sup> Previous studies have explored tunnelling through inter-corporate loans (Jiang, Lee, and Yue, 2010), related-party transactions (Bates, Lemmon, and Linck, 2006, and Baek, Kang, and Lee, 2006) and earnings management (Bertrand, Mehta, and Mullainathan, 2002).

<sup>3</sup> For example, Filatotchev, Zhang, Piesse (2011) and Anderson et al. (2012) focus on families' informed trading; Demsetz (1986) and Chan, Chen, and Hilary (2010) directly explore families' insider trading.

multiple agency conflicts. These may include the conflict between managers and family owners (Jensen and Meckling, 1976; Demsetz and Lehn, 1985), and conflicts between family owners and minority shareholders (Anderson, Duru, and Reeb, 2009; Claessens, Djankov, Fan, and Lang, 2002). In the first-order extraction of private benefits of control via tunnelling, family owners compete for rents with opportunistic managers, while in the second-order extraction of private benefits of control via trading, family owners compete for private rents with other informed investors.

In this paper test three hypotheses that focus on family ownership entrenchment/liquidity- using effects, family leadership monitoring/liquidity-promoting effects, and family board overrepresentation entrenchment/liquidity-restricting effects on the first and second-order extraction of private benefits of control via tunnelling and trading. The family ownership entrenchment/liquidity-using hypothesis suggests that family ownership concentration can be associated with entrenchment effects that stimulate agency conflicts between families and external investors. Controlling families can substitute for the disciplinary role of transparency by lowering the need for greater disclosure compared with firms with diverse ownership (Ball, Robin, and Wu, 2003). This can facilitate tunnelling activity by the family that leaves outside investors largely uninformed (Anderson, Duru, and Reeb, 2009). On the other hand, the entrenchment effect of the first-order tunnelling can also give family owners strong incentives to use the liquidity provided by uninformed investors and extract their second-order private benefits via trading. The level of ownership concentration by families can reduce both informed and uninformed trade, but does not affect the structure of trade. However, if families participate in trading by submitting their informed orders to take advantage of liquidity, they shift the structure of trade into one dominated by informed trading. Overall, if family ownership is associated with entrenchment/liquidity-using effects, we expect to observe a positive relation between family ownership and the existence of private information as well as the adverse structure of trade.

The family leadership monitoring/liquidity-promoting hypothesis suggests that family leadership (e.g., family members in key positions of a CEO and/or board Chair) is used by family owners to mitigate managers' first-order extraction of private benefits of control via tunnelling (Anderson and Reeb, 2004; Villalonga and Amit 2006, 2010), and the costly monitoring activities by leading a company can stimulate family block-holders to initiate and/or promote informed trading to emphasise their value-adding monitoring efforts (Kahn and Winton, 1998). Such liquidity promoting effects can come from at least three sources: (1) any information distortion under family leadership can bring high social pressure and threaten the legitimacy in their leadership role (Arthaud-Day, Certo, Dalton and Dalton, 2006) thus mitigating their opportunistic incentives; (2) the

internalized information flows between management and the board under family leadership can improve the quality of public disclosure and hence attract more market participation (Bhushman, Piotroski, and Smith, 2005); and (3) the long investment horizons associated with family leadership can correct managerial myopia and promote long term investments, such as R&D (Gomes-Mejia, Larraza-Kintana, and Makri, 2003; Bushee, 1998). By buying more shares, families signal their private information to the market (Lakonishok and Lee, 2001), which can attract more informed investors (Rubin, 2007) and ultimately promote the price discovery process in an improved liquidity environment. Overall, if family leadership is associated with monitoring/liquidity-promoting effects, we expect to observe a negative relation between family leadership and the existence of private information, and a positive relation between family leadership and informed and uninformed trade in the stock market. This leaves the relation between family leadership and the structure of trade ultimately an empirical question.

Unlike family leadership, the entrenchment/liquidity-restricting hypothesis suggests that board overrepresentation by the family (e.g., the percentage of family related directors on the firm's board is higher than fractional level of family ownership) is used as an entrenchment-enhancing tool to facilitate first-order tunnelling. But at the same time this limits second-order informed trading that is done to avoid leaking the private information associated with their first-order value-destroying tunnelling activities. Because of the relatively higher risk of extracting private benefits via trading than via tunnelling due to a reluctance to violate insider trading laws (Beny, 2007), it is reasonable for family owners to give up their second-order informed trading profits to secure their first-order private benefits of control via tunnelling. Family entrenchment in extracting private benefits via tunnelling together with the lack of second-order informed trading can negatively affect liquidity by decreasing the participation of liquidity traders as well as potential informed investors, such as institutional investors (Glosten and Milgrom, 1985; Back, Cao and Willard, 2000; Ferreira and Laux, 2007). This slows down the whole price discovery process in the stock market (Easley and O'Hara, 2004). Overall, if family board overrepresentation is associated with entrenchment/liquidity-restricting effects, we expect a positive relation of board overrepresentation to the existence of private information and a negative relation to informed and uninformed trading in the stock market. Again, this makes the relation between family board overrepresentation and the structure of trade ultimately an empirical question.

Finally, we segregate the sample of family firms into founder-family firms and heir-family firms to explore whether founder and heir families are different in extracting private benefits of control. It is not clear whether founder family and heir family are different in terms of their monitoring capabilities or entrenchment.

Prior research suggests that a combination of specialized knowledge, prestige and emotional ties to the firm of founder families' may better align their interests with minority shareholders and add value to the company (Demsetz and Lehn, 1985). In contrast, heir control arises because of founder-descendant ties rather than merit, with heirs being less able and less committed to the firm than the founders (Morck and Yeung 2003; Perez-Gonzalez, 2006). These potential differences between founder- and heir-family firms focus on family leadership and board control, and suggest that the family leadership monitoring-liquidity promoting hypothesis may be more relevant to founders while the family board overrepresentation entrenchment-liquidity restricting hypothesis is more applicable to heirs.

We test our theoretical assumptions using a sample of firms listed on the Hong Kong Stock Exchange (HKSE). Although this paper focuses on a single market, HKSE shares many similarities with other stock exchanges, especially those from emerging economies that adopt the order-driven, non-specialist stock market structure (Comerton-Forde and Rydge, 2006). According to Claessens, Djankov, and Lang(2000), family owners control more than 64 % of the public companies listed on HKSE, similar to many emerging economies as well as those in continental Europe (Bebchuk and Weisbach, 2010). A substantial volume of information transmission is facilitated through private channels or Chinese *guanxi*, leaving minority shareholders largely uninformed. We use a market microstructure model to capture the existence of private information and the structure of trade. As one of the largest developed order-driven, non-specialist equity markets, HKSE provides institutional support for a liquid and efficient market (Morck, Yeung, and Yu, 2000). Compared with many developed quote-driven and specialist markets, such as the New York Stock Exchange, HKSE mitigates market structure-related factors such as dealer inventory and market maker monopoly power in observing orders, both of which can explain private information risk (Comerton-Forde and Rydge, 2006; O'Hara and Oldfield, 1986; Brockman and Chung, 2000). Therefore, HKSE highlights the importance of firm-level governance in explaining the existence of private information and informed trading observed in the stock market and thus is an important laboratory to explore the corporate governance effects of family owners on different order extraction of private benefits of control captured by market microstructure modelling. Finally, the Hong Kong stock exchange is similar to many countries that have an insider trading legislation but where this is not supported by effective enforcement (Beny, 2007), so our results may have wider implications.

Our analysis indicates that family ownership is associated with entrenchment-liquidity using effects, which help families extract private benefits via both tunnelling and trading. Family board overrepresentation is associated with entrenchment-liquidity restricting effects, which helps family tunnelling activity and limits

market scrutiny via informed trading. Family leadership is associated with monitoring-liquidity promoting effects, which helps families prevent managerial tunnelling, and promotes the price discovery process. Founder- and heir-families differ mainly due to their different incentives to take leadership roles or secure overrepresentation of the board. Family block-holders reduce both informed and uninformed trade but have informational effects on liquidity by increasing the weight of informed over uninformed trade. Tunnelling and trading are two independent mechanisms to extract private benefits and are not substitutes even after controlling for endogeneity.

Our results are robust to alternative specifications for family firm definitions with a minimum control threshold of 10% or 20% of the voting shares. Our results are also generally robust to alternative econometric techniques, including multivariate and truncated regressions. To mitigate selection bias, we follow Caliendo and Kopeinig (2008) and construct a propensity score matched sample of family and nonfamily firms and obtain similar results.

This study makes four important contributions. First, by simultaneously analyzing two different orders of the extraction of private benefits of control via tunnelling and trading, this study extends previous research on private benefits of control, especially the effects of family block-holdings. It contributes to our understanding of the complete scale of the extraction of private benefits of control by families in an emerging economy.

Second, although earlier studies suggest that large block-holders are more likely to be informed traders (Rubin, 2007; Heflin and Shaw, 2000), previous research on block-holder effects on liquidity is still unclear with regard to whether block-holders negatively affect liquidity via informed trade or simply by reducing liquidity relative to a diffused ownership structure<sup>4</sup>. We distinguish between trade initiated by informed traders and by liquidity traders and focus on the structure of trade executed in the stock market, which represents an important but relatively ignored dimension of liquidity characteristics. This is different from other traditional liquidity measurement such as trade volume, number of trades, and number of shares per trade. We present evidence that large family block-holders can increase the possibility of a private information event, reduce both

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<sup>4</sup> For example, Heflin and Shaw (2000) find that higher block ownership negatively affects liquidity by causing wider spread, less depths, and higher adverse selection costs. They attribute these findings to block-holder possible private information-based trading activities negatively affecting liquidity. Cao, Field, and Hanka (2004) find that the block-holders' participation in trading improves the liquidity for all investors, which can offset the negative effects on liquidity associated with their possible private information-based trading activity. Brockman, Chung and Yan (2009) argue that block ownership is detrimental to the firm's market liquidity only because of its less active trading activity rather than its private information-based trading. They present evidence indicating that block-holders do not lead to wider spreads and lesser depths after controlling for the reduced trading activity associated with block-holders.

informed and uninformed trade but change the structure of trade. Further, their effect on the structure of trade is independent of company size, volatility and the corresponding available liquidity support in the stock market.

Third, there has been active debate on whether the probability of private information based trading (PIN) estimated by the Easley, Kiefer, and O'Hara's model (EKO model) (1997a, b) captures information risk (Li, Wang, Wu, and He, 2009; Aslan, Easley, Hvidkjaer, and O'Hara, 2011) or just liquidity risk in explaining asset returns (Mohanram and Rajgopal, 2009; Duarte and Young, 2009). This paper decomposes PIN into a tunnelling component and a trading component. This contributes to the literature by highlighting that PIN combines two aspects of information (tunnelling) and liquidity (trading). By controlling for endogeneity between tunnelling and trading, we find that these two aspects remain independent of each other and, more specifically, they are not substitutes.

Fourth, our analysis of firm level governance not only captures the family ownership effect on different orders of extraction of private benefits of control via tunnelling and trading, but also differentiates family incentives associated with board leadership and board over-representation. We also recognise the difference between founder- and heir-families within the context of different orders of extraction of private benefits of control. Our results reveal that founders and heirs differ mainly due to the different incentives they face to take leadership of the board or over-representation of the board.

The remainder of the paper proceeds as follows. Section 2 describes the sample, discusses the variables used and provides summary statistics. Section 3 presents the empirical results and Section 4 concludes.

## **2. Sample and Data**

We initially used the 812 listed companies on HKSE in December 31, 2006 with data collected from OSIRIS. We then excluded financial firms because government regulation potentially affects firm ownership structure and corporate disclosure and also removed companies with incomplete data or extreme values. Intraday trade data and bid-ask data for Hong Kong-listed companies from April 1 to June 30 2006 were obtained directly from the HKSE with the requisite 40 trading days. This period was not subject to any special events such as high market volatility, major policy changes or economic recession. We manually collected data from company annual reports, supplemented with OSIRIS, WorldScope, and the Bank of China (Hong Kong)-QianLong databases on family characteristics, including ownership level, and family board leadership, family members as the directors in the board, founders and heirs. The final sample consists of 455 firms.

### *2.1. Family Firms*

We initially define family firms as those whose largest shareholder is the family. Following Claessens, Djankov, and Lang (2000), membership of the controlling family is identified by linking corporate insiders including CEO, board members, board chairman, honorary chairman and vice chairman that share a common family and second name with the largest owner. The shareholding of individual family members is summed to define the total for the family. In addition to the share ownership stakes directly owned by the controlling family, ownership by outside firms controlled by the same family are also included. The latter accounts for an ownership pyramid effect that may increase voting power beyond the limits of immediate share ownership (see Zingales, 1995, for a discussion). Since in many emerging economies large control stakes are not unusual (La Porta, Lopez-de-Silanes, and Shleifer, 1999), minimum thresholds for family ownership (for example, 10%, or 20%) are common in the literature (Claessens, Djankov, and Lang, 2000). In line with previous research, in the robustness analysis, we examine how our results change when we impose additional conditions for family firms. Those conditions include a minimum control threshold of 10% or 20% of the votes. We find consistent results by using these different family firm definitions.

Beside family ownership, we investigate the governance effects of family board leadership and board overrepresentation. A Family Board Leadership dummy (FBLD) is equal to 1 if Chairman of the board and/or CEO are classified as the members of the largest controlling family, and 0 otherwise. Following Anderson, Duru, and Reeb (2009), to capture the family over-representation on the board, we use a Family Board Overrepresentation dummy (FBOD) that is equal to 1 if the percentage of family-related directors on the board is more than the fractional level of family ownership in the firm, 0 otherwise.

We later segregate family firms into founder-family firms and heir-family firms. Following Anderson, Duru, and Reeb (2009), founder-family firms are those in which the founder continues to maintain a presence in the firm either as a largest shareholder, or serves as a director, Chairman or CEO. Heir-family firms are the remaining family firms. When there is more than one founder, either because there were joint founders or because the firm is the result of a merger of family firms, we consider as the founding family the one with the largest voting stake.

## *2.2 The first- and second-order extractions of private benefits of control*

We use the parameter vector  $\theta = (\alpha, \delta, \mu, \varepsilon_s, \varepsilon_b)$  estimated from the EKO model to capture and measure different order extraction of private benefits. This parameter vector  $\theta$  is estimated simultaneously by

maximizing the likelihood function  $V = \prod_{i=1}^I L(\theta | B_i, S_i)$  for each share for at least 40 day periods (Easley,

O'Hara, & Paperman, 1998). Given the co-existing and/or possible substitution of different forms of private benefits of control (Atanasov, Black, Ciccotello, and Gyoshev, 2010), such simultaneous estimation to capture the overall scope of private benefits extractions is important.  $\alpha$  is the probability of a private information event,  $\delta$  is the possibility that such private information is negative, while  $\mu$  is the arrival rate of informed trade, and  $\varepsilon_b$ ,  $\varepsilon_s$  are the arrival rates of uninformed buy trades and uninformed sell trades that are similar to each other. The daily numbers of buyer- or seller-initiated trades are sufficient statistics for the data to estimate the parameter vector  $\theta$ . For each single trading day, the likelihood L is a mixed distribution where the trade outcomes are weighted by the probability of it being a “good private information day”  $\alpha(1-\delta)$ , a “bad private information day” ( $\alpha\delta$ ), and a “no private information day” ( $1-\alpha$ ). The trade process for a single trading day is:

$$\begin{aligned}
L(\theta | B, S) &= (1 - \alpha) e^{-\varepsilon_b} \frac{\varepsilon_b^B}{B!} e^{-\varepsilon_s} \frac{\varepsilon_s^S}{S!} \\
&+ \alpha \delta e^{-\varepsilon_b} \frac{\varepsilon_b^B}{B!} e^{-(\mu + \varepsilon_s)} \frac{(\mu + \varepsilon_s)^S}{S!} + \\
&\alpha(1 - \delta) e^{-(\mu + \varepsilon_b)} \frac{(\mu + \varepsilon_b)^B}{B!} e^{-\varepsilon_s} \frac{\varepsilon_s^S}{S!}
\end{aligned} \tag{1}$$

The first-order extraction of private benefits via all possible tunnelling activities is captured by the possibility of a private information event ( $\alpha$ ). In the robustness test, we focus on the negative characteristics of tunnelling activities by using the possibility of a private information event which is negative in nature ( $\alpha\delta$ ).

The second-order extraction of private benefits via trading is captured by the structure of trade ( $\frac{\mu}{\varepsilon}$ ). We do not

use the traditional PIN measure,  $PIN = \frac{\alpha\mu}{\alpha\mu + 2\varepsilon}$ . This is because PIN actually combines the two dimensions

of private information risk: the existence of private information  $\alpha$  and the structure of trade  $\frac{\mu}{\varepsilon}$ , which does not distinguish between different order extraction of private benefits via tunnelling and trading.

Each trade is specified as buyer- or seller-initiated using the standard Lee-Ready algorithm (Lee and Ready, 1991). The algorithm classifies any trade that takes place above (below) the midpoint of the current quote spread as a buy (sell) because trades originating from buyers (sellers) are most likely to be executed at or near the ask (bid). For trades taking place at the midpoint, a tick test based on the most recent classified trade is used. Large trades are often broken down and matched against multiple investors. Following Hasbrouck (1988), all trades occurring within 5 seconds of each other are classified as a single trade.

### *2.3. Control Variables*

To avoid spurious correlation, we control for factors that may affect the overall private information risk. Previous research suggests that bigger boards with stronger incentives to monitor mitigate agency problems in their firms (Anderson and Reeb, 2004). We use the natural logarithm of the number of directors and the shareholdings of directors who do not belong to controlling families to measure board size and the incentive to monitor, respectively. Previous research suggests that firm size may have an information effect (Barry and Brown, 1984; Easley, Hvidkjaer, O'Hara, 2002). Thus, the natural logarithm of equity market capitalisation at end 2006 is used to control for firm size. Previous research also indicates that liquidity measured by trading volume signals a demand shock that can lead to higher future return (Llorente, Michaely, Saar, Wang, 2002) while illiquid stocks are less likely to be of interest to informed traders (Shleifer and Vishny, 1997b). Therefore the natural logarithm of the mean monthly trading volume in 2006 is used to control for liquidity factor. Risk of future value is a prerequisite for information asymmetry (Huddart, Ke, and Shi, 2007), which can be captured by share price volatility (Demsetz and Lehn, 1985). To control for risk and uncertainty in informed trading decisions the standard deviation of daily share returns in 2006 is used. Aslan, Easley, Hvidkjaer, and O'Hara (2011) find that the overall private information risk has a small negative correlation with firm growth and profitability. To control for growth and profitability factors, we use sales growth in 2006 and a lagged return on equity capital measured by the ratio of EPS over the book value per share in 2005. Easley, O'Hara, and Paperman (1998) suggest that analysts may turn private information into public while Aslan, Easley, Hvidkjaer, and O'Hara (2011) find that older firms tend to have low level of private information risk. To control for these factors, we use firm age measured by the natural logarithm of the number of years the company has been listed on the Hong Kong Stock Exchange in 2006, and financial analysts' coverage measured by the natural logarithm of the number of the first year forward EPS estimates available from Institutional Brokers' Estimate System (I/B/E/S) in 2006. Industry effects are controlled by dummies for the 2-digit SIC codes.

### *2.4. Summary Statistics*

Table I provides two panels of summary statistics. Panel A reports means, medians, standard deviations, minimum, and maximum values. Panel B presents differences of means tests between: (i) family firms and non-family firms; (ii) founder-family firms, and nonfamily firms; and (3) heir-family firms and nonfamily firms. Family-firms account for 370 (81.32%) observations and nonfamily firms represent the remaining 85 (18.68%) observations. Within family-firms, family members hold the post of CEO and Chairman in 219 (59.15%)

observations and professional managers in 151 (40.85%) observations. For 65 (17.57%) observations within family firms, family members are over-represented on the board.

Within the founder-family firms, founding families hold the post of CEO and Chairman in 104 (71.72%) observations and professional managers in 41 (28.28%) observations. For 29 (20.14%) observations within founder-family firms, family members are over-represented on the board. Heir-family firms present a somewhat different picture. Within the heir-family firms, families hold the post of CEO and Chairman in 116 (51.56%) observations and professional managers in 109 (48.44%) firms, approximately a 50/50 split between heir board leadership and professional managers' leadership<sup>5</sup>. For 36 (16.00%) observations within heir-family firms, family members are over-represented on the board. In terms of ownership, families hold 48.52% of the firm equity, and founder-families (heir-families) maintain an average equity stake of 50.94% (46.97%).

In terms of the first order extraction of private benefits of control via tunnelling and second order via trading, for the average firm in our sample, the tunnelling possibility is 0.32 and the trades by informed investors are as 3.53 times higher than the trades by uninformed investors. Because we removed financial companies, our sample has a higher possibility of the existence of private information and higher intensity of informed orders over uninformed orders compared to a sample with financial companies used by Lai, Ng and Zhang (2009). Lai, Ng, and Zhang(2009) find that in Hong Kong, the possibility of the existence of private information is 0.20 and the intensity of informed orders over uninformed orders is about 2.73. It is possible that financial companies have lower tunnelling activity and lower intensity of informed trade over uninformed trade than non-financial companies because of their higher level of regulatory scrutiny.

Firm size varies considerably across the full sample with average equity market capitalization of HK\$13,000 million and a median of HK\$981 million. Minimum and maximum values are HK\$0.95 million, and HK\$1,341,840 million respectively. The large variance across the full sample is also found for liquidity and volatility, with the average monthly mean trade volume HK\$7.98 million, minimum and maximum values for monthly trade volumes HK\$0.03 and HK\$524 million respectively; and the average daily return volatility of 14.23%, with minimum and maximum values being 1.75% and 74.77% respectively.

Panel B presents the difference of means tests between family firms and nonfamily firms, between founder-firms and nonfamily firms, and between heir-family firms and nonfamily firms. Relative to nonfamily firms, family firms tend to be smaller in terms of market capitalization (HK\$8,060 million versus HK\$34,400 million), board size (8.47 versus 10.68) and nonfamily director shareholdings (1.13% versus 1.81%), less liquid

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<sup>5</sup> The finding that heir family firms are more likely to hire professional CEOs or Chairmen relative to founder-family firms is consistent with the notion that heirs are less able than founders (Perez- Gonzalez, 2006).

(6.37 million shares versus 15.00 million shares), lower analyst coverage (2.26 of the first year forward EPS estimates versus 7.00 of the first year forward EPS estimates), older (13.84 years versus 11.64 years) but more volatile (13.34% versus 10.91%). When we segregate the family firms into founder-family firms and heir-family firms, heir-family firms have smaller nonfamily director shareholdings (1.07% versus 1.81%), they are older (15.50 years versus 11.64 years) but more volatile (14.23% versus 10.91%) and have lower ROE (-12.79% versus 5.23%) than nonfamily firms, while founder-family firms tend to be similar to nonfamily firms in terms of these variables. When we only use the simplistic family and nonfamily dichotomy by ignoring firm-level characteristics, difference in governance mechanisms employed by families and the split between founder and heir, we find that family firms have a lower possibility of private benefits of control extracted via tunnelling (0.32 versus 0.35), but the higher possibility of private benefits of control extracted via trade (the intensity of informed trade over uninformed trade is 3.75 versus 2.57). Overall, the results indicate that the characteristics of family firms tend to be different from those of non-family firms. Within family firms, the characteristics of founder-family firms tend to be different from those of heir-family firms.

<Table 1 here>

### 3. Multivariate analysis

Table 2 presents two sets of multivariate regression results. In Column 1, we report the results for the family influence on the first order tunnelling. In Column 2, we report the results for the family influence on second order trading. As Column 1 shows, we find that family ownership and family board overrepresentation exhibit a positive relation to the first order tunnelling, consistent with the entrenchment hypothesis and suggesting that family owners use ownership and board overrepresentation to entrench themselves against minority shareholders to extract private benefits via tunnelling activities. We also find that family board leadership exhibits a negative relation to the first-order tunnelling consistent with the monitoring hypothesis and suggesting that family owners mitigate managerial opportunism by taking a leadership position in extracting their first-order tunnelling. As Column 2 shows, we find that family ownership exhibits a positive relation to the second-order trading consistent with the liquidity-taking hypothesis. Family leadership and board overrepresentation are not significantly related to the structure of trade in this test.

Evaluating possible levels of first-order extraction of private benefits via tunnelling at the 50th percentile of family ownership suggests that family ownership increases this by 14.23%. We calculate this differential as the coefficient estimate on ( $\beta_2$ ) multiplied by family ownership, divided by the average possibility of a private information event for the nonfamily sample  $((0.10*49.8\%)/0.35)$ . Family board

overrepresentation increases such a possibility by 14.29%. We calculate this differential as the coefficient estimate on ( $\beta_4$ ) multiplied by family board overrepresentation, divided by the average possibility of the existence of private information for the nonfamily sample  $((0.05*1)/0.35)$ . Overall, families with the 50th percentile family ownership level and over-representation on the board increase the possibility of the existence of private information by 28.52%. Family board leadership decreases the tunnelling possibility by 17.14%. We calculate this differential as the coefficient estimate on ( $\beta_3$ ) multiplied by family board leadership, divided by the average possibility of the existence of private information for the nonfamily sample  $((-0.06*1)/0.35)$ .

Evaluating the intensity of informed orders over uninformed orders at the 50th percentile of family ownership suggests that family ownership increases the intensity of informed orders over uninformed orders by 24.80%. We calculate this differential as the coefficient estimate on ( $\beta_2$ ) multiplied by family ownership, divided by the natural log of the intensity of informed trade over uninformed trade for the nonfamily sample  $((0.47*49.8\%)/\ln(2.57))$ .

With respect to control variables, Table 2 indicates that the possibility of tunnelling is higher in firms with lower market liquidity and lower share return volatility, suggesting that first-order private benefits of control via tunnelling tend to be extracted in an environment lacking in market scrutiny and efficient price discovery process, consistent with Anderson, Duru, and Reeb, (2009). Table 2 also indicates that the possibility of tunnelling is lower in firms with larger analyst coverage, consistent with Easley, O'Hara, and Paperman (1998) and suggesting that analysts can play an external governance role in turning private information into public and potentially preventing tunnelling activities. Regarding the second order extraction of private benefits via trading, Table 2 shows that the intensity of informed trade over uninformed trade is lower in firms with larger board and more nonfamily board ownership, indicating that an increase in number of potentially informed directors with higher incentives to monitor controlling families can reduce families' incentives to extract second-order private benefits via trading. The intensity of informed trade over uninformed trade is also lower in larger firms, and those with higher market liquidity and larger analyst coverage, indicating that efficient market scrutiny can reduce families' incentives to trade. But the intensity of informed trade over uninformed trade is higher in the firms with higher share return volatility, indicating more volatile trading environments creates more opportunities for informed traders to extract private information based trading profits at the expense of uninformed traders.

<Table 2 here>

### 3.1 Founder- vs heir-families

Our previous analysis does not consider the potential difference between founder- and heir-families. Now we separate family firms into founder-family and heir-family firms to explore their potential difference. We report the results for the influence of founder- or heir-families in Table 3 Panels A and B. As Column 1 shows, founder-family board leadership exhibits a negative relation to the first order tunnelling, consistent with the monitoring hypothesis. We do not find any significant relation between founder-family ownership (founder-family board overrepresentation) and the first order tunnelling. Column 2 shows that heir-family board leadership is negatively related to the first order tunnelling, similar to founder family board leadership and consistent with the monitoring hypothesis. We find that heir-family ownership exhibits a positive relation to the first order tunnelling, different from founder-family ownership. This suggests that entrenchment effects are more likely to dominate monitoring effects in heir-family firms than in founder-family firms. We also find that heir-family board overrepresentation exhibits a positive relation to the first order tunnelling, different from founder-family board overrepresentation. Again, this suggests that family board overrepresentation is more likely to be used by heir-families as the entrenchment-enhancing mechanism.

As Column 3 shows, founder-family ownership exhibits a positive relation to the second order extraction of private benefits via trading, consistent with the liquidity-taking hypothesis. We do not find any significant relation between founder-family board leadership (founder-family board overrepresentation) and the second order trading. As Column 4 shows, heir-family ownership exhibits a positive relation to the second-order extraction of private benefits via trading, similar to founder-family ownership and consistent with the liquidity-taking hypothesis. In addition, we find that heir-family board overrepresentation is negatively related to the second order trading, different from founder family board overrepresentation. This is in line with suggestions that family board overrepresentation is more likely to be used by heir-families as the entrenchment mechanism in terms of the first order tunnelling as well as the liquidity restricting mechanism in terms of the second order rent extraction to limit informed trading on their value-destroying tunnelling activities. Taken together, the comparisons between founder- and heir-families highlight that heir-family ownership is more likely than founder-family ownership to be associated with entrenchment-liquidity taking effects in tunnelling and trading. It is also more likely for heir-families to be associated with entrenchment/liquidity-restricting effects when they are overrepresented on the board than for founder-families.

<Table 3 here>

### *3.2. The negative nature of tunnelling and the informed and uninformed trade behind trade structure*

Our results so far show that a positive relation between heir-family ownership and the possibility of a private information event. We interpret this as evidence consistent with heir-families' entrenchment vis-a-vis uninformed investors to extract their first order private benefits via tunnelling. However, private information may be due to strategic considerations rather than tunnelling activities. To examine the negative nature of tunnelling activities, we further test family influence on the first order extraction of private benefits by focusing on the possibility that there is a private information event *and* such private information is negative in nature. We use the product of the possibility of a private information event  $\alpha$  and the possibility that the private information is negative  $\delta$  as our dependent variable. The results are reported in Table 4 Panel A. As Table 4 Panel A Column 1 shows, we find a positive relation between family ownership and the possibility of negative private information revealed in the market. In Column 2 such a positive relation does not hold for founder-family ownership, but does hold for heir-family ownership. Therefore, this additional evidence confirms our interpretation that family ownership, especially heir-family ownership, is associated with entrenchment effects to extract private benefits via tunnelling activities.

Our results also show a negative relation between heir-family board overrepresentation and the structure of trade. We interpret this as evidence that heir-families use the board overrepresentation mechanism to restrict liquidity and deter market scrutiny of their tunnelling activities via informed trading. To confirm this, we need to know how family board overrepresentation affects the absolute amount of informed and uninformed trade behind the trade structure. The results are reported in Table 4 Panel B and C. Heir-family board overrepresentation exhibits a negative relation to the informed trades (significant at 5% level) and a negative relation to the uninformed trades (weakly significant at 10% level), indicating that heir-family board overrepresentation deters additional market participation, especially by potentially informed traders, and slows down the price discovery process in the market. We did not find such a negative relation for founder-family board overrepresentation. These additional results further confirm that heir-family board overrepresentation is associated with entrenchment/liquidity-restricting effects.

Although both founder- and heir-family leadership is associated with monitoring effects with regard to the first order extraction of rents, it is not clear whether it is associated with liquidity-promoting effects in relation to the second order extraction. As Table 4 Panel B and C show, family leadership exhibits a positive relation to the informed orders (significant at 5% level) and a positive relation to the uninformed orders (weakly significant at 10% level), indicating that family leadership attracts additional market participation, especially from potentially informed traders and promotes the price discovery process in the market. Founder-family board

leadership is more likely than heir-family board leadership to promote market liquidity. The additional results further confirm that founder-family leadership is more likely than heir-family leadership to be associated with monitoring/liquidity-promoting effects.

Table 4 Panels B and C also show that family ownership exhibits negative relations to both informed and uninformed orders. Combining the previous results in Tables 2 and 3, which indicate that family ownership changes the structure of trade by increasing the intensity of informed trade, the additional results here further suggest that families not only reduce the informed and uninformed trade, but also have informational effects on the liquidity by increasing the weight of informed trade over uninformed trade.

<Table 4 here>

### *3.3 The substitution between tunnelling, trading and family firm governance*

Given that different forms of private benefits of control can substitute each other (Atanasov, Black, Ciccotello, and Gyoshev, 2010), we test whether first order tunnelling can substitute second order trading. The results are reported in Table 5. As Table 5 Panel A shows the possibility of tunnelling exhibits a significant and negative relation to the structure of trade, indicating that first order tunnelling as a relatively safer means to extract private benefits can substitute for second order trading. It seems logical to assume that tunnelling through private information is more likely to be the first order activity while trading in private information is a second order activity. This follows from the relative safety and low costs of tunnelling compared to the relatively risky and potentially costly trading on private information. Table 5 Panel A also shows that family ownership exhibits a significant and positive relation to the structure of trade after controlling for first order tunnelling. This indicates that, although family ownership can indirectly reduce second order trading by shifting emphasis to the first order extraction via tunnelling, family ownership (both founder- and heir-family ownership) can directly increase the second order extraction of private benefits of control via trading.

However, possible endogeneity between tunnelling and trading activity can bias our results. To control for this, we perform further tests using 2SLS estimation. In the tunnelling regression, we use the interaction between free cash flow and sales growth as the instrumental variable for tunnelling because managers/controllers can divert these resources away from growth opportunities into private benefits (Jensen 1986; Lehn and Poulsen, 1989). In the trading regression, we use market capitalisation as the instrumental variable for trading because this provides the liquidity base for trading in the stock market. We find that the interaction between free cash flow and sales growth as our instrumental variable is significantly ( $p < 0.001$ ) correlated with tunnelling ( $\alpha^*\delta$ ), but not significantly correlated with trading; while the market capitalization is

significantly ( $p < 0.001$ ) correlated with trading, but not significantly correlated with tunnelling ( $\alpha * \delta$ ). As Table 5 Panel B shows, after controlling for endogeneity, the significant substitution relation between tunnelling and trading disappears, suggesting that tunnelling and trading as mechanisms to extract private benefits of control are independent of each other. We also perform the reversed test using trading to explain tunnelling and do not find any significant substitution relation between them (not reported here).

<Table 5 here>

### *3.4 Robustness tests*

Although we control for a variety of firm-specific characteristics, we also perform a robustness test to compare family firms with similar nonfamily firms by constructing a propensity score matched sample. Using a logit model with the family firm dummy as the dependent variable, we match family to nonfamily firms based on board size, non-family director ownership, market capitalization, liquidity, volatility, return on equity, sales growth, analyst coverage, and firm age. Following Caliendo and Kopeinig (2008), our propensity score model uses one to one matching, a radius/caliper of 0.1, and a common support range of (0.30 to 0.99). Finally, we allow observations to be used as a match more than once, thus making the order of matching irrelevant and removing sample size constraints. The matching process yields a sample of 361 family firms and 361 nonfamily firms. When we segregate family firms into founder-family firms and heir-family firms, we follow the similar procedure to match founder/heir family firms to nonfamily firms. The matching process yields a sample of 145 founder family firms and 145 nonfamily firms, and 225 heir-family firms and 225 nonfamily firms respectively. The results using the propensity score matched samples are presented in Table 6. Consistent with earlier results, the matched sample analysis suggests that family ownership is associated with entrenchment/liquidity-using effects; family leadership is associated with monitoring/liquidity-promoting effects; and family board overrepresentation is associated with entrenchment/liquidity-restricting effects. After we control for possible selection bias problems, the matched sample analysis further shows that founder- and heir-family ownership are similar and both are related to the entrenchment/liquidity-using effects in extracting private benefits of control via tunnelling and trading. But founder-family leadership is more likely to be associated with monitoring/liquidity-promoting effects rather than heir-family leadership while heir family board overrepresentation is more likely than founder family board overrepresentation to be associated with entrenchment/liquidity-restricting effects. After controlling for endogeneity, the significant substitution relation between tunnelling and trading disappears in the matched sample analysis, which again confirms that the

tunnelling and trading as the two independent mechanisms to extract private benefits of control. We also run additional tests using truncated regression and obtained similar results (not reported here).

<Table 6 here>

#### **4. Conclusion**

We examine the impact of controlling families on the first and second order extraction of private benefits of control via tunnelling and trading in an emerging economy. By decomposing PIN into tunnelling and trading components, our paper extends previous research on the large family shareholders' effects on private benefits of control by developing a more complete analysis of the mechanism of extraction of private rents by controlling families. Our analysis not only reveals how corporate governance mechanisms are used by controlling families to extract private benefits of control via tunnelling and trading, but also shows the difference between founder- and heir-families engaging in these activities. This paper also contributes to the debate on PIN as an information or liquidity metric by arguing that PIN can perform both functions. By controlling for potential endogeneity of tunnelling and trading, we find these to be independent from each other. By presenting evidence on large family shareholders' effects on tunnelling and trading, we also contribute to research on the block-holders' effect on liquidity and explain why and how family ownership concentration reduces informed and uninformed trade but have informational effects on liquidity.

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**Table 1 Data description**

Panels A, and B provide summary statistics of the data. The data set includes the 455 firms listed on Hong Kong Stock Exchange as of Dec 31, 2006 with complete data. *Family firms* are firms whose largest shareholder is the family. *Founder-family firms* are firms where the founder maintains a presence in the firm as a shareholder, director, and/or manager. *Heir-family firms* are those family firms without the founder maintaining the family equity position or serving director or chair or CEO position. *Family/founder/heir ownership* is the fractional equity ownership of the family/founder/heir group. *Family/founder/heir leadership* denotes the CEO and/or Chairman belong to the family/founder family/heir family. *Family/founder/heir board overrepresentation* is dummy variable denoting where the percentage of directors on the board who belong to the family/founder family/heir family is more than the fractional level of family/founder family/heir family ownership in the firm. *Non Family Directors Ownership* is the ownership of directors who are not from the largest family. *Market Capitalization of Common Equity* is the market value of outstanding common equities in the end of 2006. *Liquidity* is the average monthly trading volume in 2006. *Volatility* is the standard deviation in daily share return in the year 2006. *Growth* is the growth ratio of sale revenue in the year 2006. *Leverage* is the debt ratio measured as total long-term debt divided by total assets in the year 2006. *ROE* is the return on Equity Capital in the year 2005. *Firm Age* is the number of years listed on the Hong Kong Stock Exchange in the year 2006. *Analysts' coverage* is the number of the first year forward EPS estimates available from I/B/E/S in the year 2006. *Alfa* is the possibility of private information event in the 2006, which is used to measure the first order private benefits of control via tunnelling. *MTE* is the intensity of informed trade over uninformed trade in the stock market in 2006, which is used to measure the second order private benefits of control via trading.

Panel A: Summary Statistics for Full Sample (n=455)

Variable	Mean	Median	Sta. Dev.	Minimum	Maximum
Family Firms (n=370)	81.32%	---	---	---	---
Family Ownership	48.52	49.80	17.20	10.00	89.64
Family Leadership (n=219)	59.19%	---	---	---	---
Family Board Over-Representation (n=65)	17.57%	---	---	---	---
Founder-Controlled Firms (n=145)	31.87%	---	---	---	---
Founder-Family Ownership	50.94	52.195	15.47	10.00	79.98
Founder Leadership (n=104)	71.72%	---	---	---	---
Founder Board Over-Representation (n=29)	20.14%	---	---	---	---
Heir-Controlled Firms (n=225)	49.45%	---	---	---	---
Heir Family Ownership	46.97	47.59	18.13	10.35	89.64
Heir Family Leadership (n=116)	51.56%	---	---	---	---
Heir Family Board Over-Representation (n=36)	16.00%	---	---	---	---
Board Size	8.65	2.08	2.75	5	19
Non-Family Director Ownership	1.07	0	2.57	0	25.5
Market Value of Equity (Million HK\$)	13000	981	70300	0.95	1341840
Liquidity (Million HK\$)	7.98	0.93	37.70	0.03	524
Volatility	14.23	10.26	11.84	1.75	74.77
Analyst Coverage	2.33	0	4.91	0	23
Firm Age	15.50	13	8.52	1	35
Growth	0.21	0.10	0.90	-0.99	8.05
ROE	-0.18	0.10	1.72	-21.34	2.41
Alfa	0.32	0.30	0.17	0.03	0.99

MTE 3.53 2.97 2.42 0.63 22.27

Panel B: Difference of Means Tests for Key variables							
Variable	Mean Values				T-test		
	Non-family	Family	Founder	Heir	Family vs Nonfamily (1)	Founder vs Nonfamily (2)	Heir vs Nonfamily (3)
Number of Observations	85	370	145	225	---	---	---
Family Ownership	0	48.52	50.91	46.97	54.27***	39.82***	38.87***
Family Leadership	0	59.19%	71.03%	51.56%	23.13***	18.79***	15.44***
Family Board Over-Representation	0	17.58%	20%	16%	8.87***	6.00***	6.53***
Board Size	10.68	8.47	8.19	8.65	-6.82***	-7.01***	-5.86***
Ln Board Size	2.34	2.09	2.07	2.11	-7.57***	-7.59***	-6.47***
Non-Family Board Ownership	1.81	1.13	1.21	1.07	-1.91*	-1.56	-1.97**
Market Value of Equity (million HK\$)	34400	8060	6870	8830	-1.61	-1.67*	-1.56
Ln (MV of Equity)	21.91	20.77	20.56	20.90	-4.37***	-4.80***	-3.66***
Liquidity (million HK\$)	15.00	6.37	3.89	7.97	-1.27	-1.66*	-0.99
Ln (Liquidity)	14.54	13.64	13.47	13.76	-3.67***	-4.06***	-3.00***
Volatility	10.91	13.34	11.95	14.23	3.49***	1.26	3.37***
Analyst Coverage	7.00	2.26	2.14	2.33	-4.79***	-4.73***	-4.60***
Ln (1+AC)	1.36	0.59	0.61	0.58	-5.32***	-4.86***	-5.17***
Firm Age	11.64	13.84	11.26	15.50	2.78***	-0.41	4.44***
Ln (Firm Age)	2.26	2.41	2.18	2.56	1.77*	-0.70	3.29***
Growth (%)	57.39	18.85	14.74	21.49	-1.43	-1.57	-1.31
ROE (%)	5.23	-4.09	0.09	-12.79	-1.62	1.07	-2.17**
Alfa	0.35	0.32	0.31	0.32	-1.86*	-1.80*	-1.66*
MTE	2.57	3.75	3.74	3.75	5.26***	4.19***	4.79***

**Table 2 The extraction of private benefits and family governance**

This table reports multivariate regression results of the first order extraction of private benefits via tunnelling (alfa) on family ownership, family leadership and family board overrepresentation in Panel A; and results of the second order extraction of private benefits via trading (LnMTE) on family ownership, family leadership and family board overrepresentation in Panel B. Variable definitions are given in Table 1. Industry effects are controlled by dummies associated with 2-digit SIC codes. T-values are in parentheses. \*\*\* /\*\*/\* indicate significance at the 1%/5%/10% level or better.

	1.Alfa	2.LnMTE
	Family vs Nonfamily	Family vs Nonfamily
Family Dummy ( $\beta_1$ )	-0.04 [-1.22]	-0.22** [-2.39]
Family' Ownership ( $\beta_2$ )	0.10** [1.96]	0.47*** [3.23]
Family Leadership ( $\beta_3$ )	-0.06*** [-3.26]	0.03 [0.64]
Family Board Over-Representation ( $\beta_4$ )	0.05** [1.96]	-0.07 [-0.99]
Board Size ( $\beta_5$ )	-0.002 [-0.05]	-0.21** [-2.34]
Non-Family Board Ownership ( $\beta_6$ )	0.44 [1.51]	-1.41* [-1.73]
Ln Market Value of Equity ( $\beta_7$ )	-0.002 [-0.29]	-0.08*** [-4.21]
Ln Liquidity ( $\beta_8$ )	-0.01** [-2.10]	-0.07*** [-5.45]
Volatility ( $\beta_9$ )	-0.004*** [-4.51]	0.01*** [4.10]
Ln Analyst Coverage ( $\beta_{10}$ )	0.03** [2.23]	-0.18** [-5.14]
Ln Firm Age ( $\beta_{11}$ )	0.001 [0.13]	-0.003 [-0.10]
Growth ( $\beta_{12}$ )	-0.01 [-1.57]	-0.01 [-0.59]
ROE ( $\beta_{13}$ )	-0.01 [-1.03]	0.003 [0.12]
Dummies for Industries	Yes	Yes
Observations	455	455
Adjusted-R Square	17.47	52.54

**Table 3 The extraction of private benefits of control, founder- and heir-family governance**

This table reports multivariate regression results of the first order extraction of private benefits via tunnelling (alfa) on founder/heir family ownership, founder/heir family leadership and founder/heir family board overrepresentation in Panel A; and results of the second order extraction of private benefits via trading (LnMTE) on founder/heir family ownership, founder/heir family leadership and founder/heir family board overrepresentation in Panel B. Variable definitions are given in Table 1. Industry effects are controlled by dummies associated with 2-digit SIC codes. T-values are in parentheses. \*\*\* /\*\*/\* indicate significance at the 1%/5%/10% level or better.

	Panel A First-Order Extraction of Private Benefits		Panel B Second-Order Extraction of Private Benefits	
	Founder vs Nonfamily 1.alfa	Heir vs Nonfamily 2.alfa	Founder vs Nonfamily 3.LnMTE	Heir vs Nonfamily 4.LnMTE
Family Dummy ( $\beta_1$ )	-0.03 [-0.55]	-0.05 [-1.16]	-0.30* [-1.93]	-0.23** [-2.29]
Family' Ownership( $\beta_2$ )	0.09 [0.91]	0.11* [1.74]	0.64** [2.39]	0.51*** [3.00]
Family Leadership( $\beta_3$ )	-0.09*** [-2.72]	-0.05** [-1.96]	0.03 [0.39]	0.05 [0.83]
Family Board Over-Representation( $\beta_4$ )	-0.01 [-0.30]	0.08** [2.43]	0.11 [1.08]	-0.17** [-1.97]
Board Size( $\beta_5$ )	-0.03 [-0.61]	0.03 [0.90]	-0.29** [-2.17]	-0.27*** [-2.69]
Non-Family Board Ownership( $\beta_6$ )	0.12 [0.29]	0.62* [1.85]	-1.09 [-0.93]	-1.25 [-1.37]
Ln Market Value of Equity( $\beta_7$ )	0.003 [0.30]	-0.01 [-1.12]	-0.07*** [-2.34]	-0.06*** [-2.90]
Ln Liquidity( $\beta_8$ )	-0.01 [-0.80]	-0.01* [-2.39]	-0.05*** [-2.89]	-0.08*** [-5.79]
Volatility( $\beta_9$ )	-0.002 [-1.01]	-0.004*** [-3.71]	0.001 [0.11]	0.01*** [4.69]
Ln Analyst Coverage ( $\beta_{10}$ )	0.01 [0.84]	0.04*** [2.64]	-0.18*** [-3.81]	-0.19*** [-4.72]
Firm Age( $\beta_{11}$ )	-0.03 [-0.21]	0.01 [0.45]	0.06 [1.26]	-0.06 [-1.58]
Growth( $\beta_{12}$ )	-0.01* [-1.85]	-0.01 [-1.11]	0.01 [0.55]	-0.01 [-0.64]
ROE( $\beta_{13}$ )	0.04 [1.00]	-0.01 [-1.05]	-0.20* [-1.65]	0.01 [0.52]
Dummies for Industries	Yes	Yes	Yes	Yes
Observations	230	310	230	310
Adjusted-R Square	15.27	21.35	50.78	57.59

**Table 4 The negative nature of tunnelling, informed trade, uninformed trade, and family governance**

This table Panel A reports multivariate regression results of the negative nature of tunnelling ( $\alpha \cdot \delta$ ) on family/founder family/heir family ownership, family/founder family/heir family leadership and family/founder family/heir family board overrepresentation. Panel B (Panel C) reports multivariate regression results of the informed trade (uninformed trade) on family/founder family/heir family ownership, family/founder family/heir family leadership and family/founder family/heir family board overrepresentation. The natural log of absolute amount of informed trade ( $\ln \mu$ ) / uninformed trade ( $\ln \epsilon$ ) is used to capture the absolute amount of informed trade/uninformed trade behind the structure of trade (MTE). Other variable definitions are given in Table 1. For simplicity, we do not report the coefficients for our control variables. T-values are in parentheses. \*\*\*/\*\*/\* indicate significance at the 1%/5%/10% level or better.

	Panel A The nature of private information			Panel B: Informed Orders			Panel C: Uninformed Orders		
	Family vs Nonfamily	Founder vs Nonfamily	Heir vs Nonfamily	Family vs Nonfamily	Founder vs Nonfamily	Heir vs Nonfamily	Family vs Nonfamily	Founder vs Nonfamily	Heir vs Nonfamily
	1. $\alpha \cdot \delta$	2. $\alpha \cdot \delta$	3. $\alpha \cdot \delta$	4. $\ln \mu$	5. $\ln \mu$	6. $\ln \mu$	7. $\ln \epsilon$	8. $\ln \epsilon$	9. $\ln \epsilon$
Family Dummy( $\beta_1$ )	-0.04** [-1.68]	-0.06 [-1.45]	-0.04 [-1.44]	0.18*** [2.48]	0.22 [1.52]	0.23** [2.18]	0.26*** [3.37]	0.36** [2.30]	0.34*** [2.83]
Family' Ownership( $\beta_2$ )	0.10** [2.49]	0.10 [1.41]	0.11** [2.25]	-0.27*** [-3.94]	-0.34** [-2.51]	-0.27*** [-2.96]	-0.39*** [-5.10]	-0.50*** [-3.43]	-0.40*** [-3.81]
Family Leadership( $\beta_3$ )	-0.04*** [-2.72]	-0.05** [-1.96]	-0.03* [-1.78]	0.10** [1.98]	0.12* [1.65]	0.08 [1.57]	0.08 [1.49]	0.11 [1.34]	0.06 [1.04]
Family Board Over- Representation( $\beta_4$ )	0.02 [1.16]	0.01 [0.26]	0.03 [1.07]	-0.06 [-1.34]	0.03 [0.52]	-0.10** [-2.21]	-0.04 [-0.76]	-0.001 [-0.02]	-0.05 [-1.05]
Observations	455	230	310	455	230	310	455	230	310
Adjusted-R Square	15.83	15.59	18.65	52.31	51.13	55.21	65.68	65.88	66.25

**Table 5 The substitution between tunnelling and trading**

This table Panel A reports multivariate regression results of the first order negative tunnelling ( $\alpha \cdot \delta$ ) on second order trading, family/founder family/heir family ownership, family/founder family/heir family leadership and family/founder family/heir family board overrepresentation. Panel B reports the 2SLS regression results by controlling the controlling for endogeneity between tunnelling and trading. Variable definitions are given in Table 1. For simplicity, we do not report the coefficients for our control variables. T-values are in parentheses. \*\*\* /\*\*/\* indicate significance at the 1%/5%/10% level or better.

	Panel A OLS			Panel B 2SLS		
	Family VS Nonfamily	Founder VS Nonfamily	Heir VS Nonfamily	Family VS Nonfamily	Founder VS Nonfamily	Heir VS Nonfamily
	1.LnMTE	2.LnMTE	3.LnMTE	4.LnMTE	5.LnMTE	6.LnMTE
Family Dummy ( $\beta_1$ )	-0.26*** [-2.83]	-0.37** [-2.51]	-0.24** [-2.33]	-0.21* [-1.80]	-0.39** [-2.42]	-0.20* [-1.71]
Family' Ownership ( $\beta_2$ )	0.57*** [3.96]	0.77*** [2.97]	0.55*** [3.21]	0.42** [2.15]	0.82*** [2.94]	0.42** [2.10]
Family Leadership ( $\beta_3$ )	0.02 [0.37]	0.01 [0.12]	0.04 [0.62]	0.11 [1.26]	-0.07 [-0.51]	0.09 [1.18]
Family Board Over-Representation ( $\beta_4$ )	-0.05 [-0.72]	0.12 [1.22]	-0.16* [-1.81]	-0.11 [-1.19]	0.10 [1.02]	-0.19** [-2.02]
$\alpha \cdot \delta$ ( $\beta_5$ )	-0.63*** [-3.76]	-0.89*** [-3.70]	-0.37* [-1.88]	1.08 [1.03]	-1.34 [-1.00]	1.10 [0.96]
Observations	455	230	310	455	230	310
Adjusted-R Square	53.64	53.75	58.04	55.44	55.80	51.74

**Table 6 Robustness tests**

This table uses the propensity matched sample for the robustness tests. In column 4,  $\alpha \cdot \delta$  is used to measure tunnelling.  $E[\text{Tunnelling}]$  is the fitted values estimated using the instrumental variables in the 2SLS. Variable definitions are given in Table 1. For simplicity, we do not report the coefficients for our control variables. T-values are in parentheses. \*\*\*/\*\*/\* indicatessignificance at the 1%/5%/10% level or better.

Panel A	1.alpha	2.alpha*delta	3.LnMTE	4.LnMTE	5.LnMTE	6.Ln Mu	7.Ln Eps
	Family vs Nonfamily						
Family Dummy ( $\beta_1$ )	-0.04 [-1.24]	-0.07*** [-3.02]	-0.22*** [-2.94]	-0.24*** [-3.29]	-0.18** [-2.15]	0.49*** [3.36]	0.75*** [4.67]
Family' Ownership ( $\beta_2$ )	0.15*** [2.83]	0.15*** [3.51]	0.56*** [4.23]	0.64** [4.94]	0.44*** [2.94]	1.15*** [-4.51]	-1.66*** [-5.95]
Family Leadership ( $\beta_3$ )	-0.04** [-2.15]	-0.02 [-1.39]	0.03 [0.59]	0.005 [0.10]	0.06 [1.21]	0.15* [1.68]	0.13 [1.37]
Family Board Over-Representation ( $\beta_4$ )	0.02 [1.03]	-0.002 [-0.10]	-0.10** [-1.96]	-0.10* [-1.66]	-0.13** [-2.12]	-0.03 [-0.29]	0.08 [0.62]
Tunnelling ( $\beta_5$ )	---	---	---	-0.71*** [-5.47]	---	---	---
$E[\text{Tunnelling}]$ ( $\beta_5^*$ )	---	---	---	---	1.00 [1.55]	---	---
Observations	740	740	740	740	740	740	740
Adjusted-R Square	13.57	16.00	56.97	58.62	57.05	54.45	69.03
Panel B	Founder vs nonfamily						
Family Dummy ( $\beta_1$ )	-0.04 [-0.65]	-0.09** [-1.96]	-0.20 [-1.42]	-0.88 [-1.43]	-0.27 [-1.43]	0.50** [1.97]	0.78*** [2.93]
Family' Ownership ( $\beta_2$ )	0.11 [1.14]	0.14* [1.84]	0.46* [1.88]	0.63*** [2.85]	0.64 [1.60]	-1.18*** [-2.65]	-1.72*** [-3.68]
Family Leadership ( $\beta_3$ )	-0.07** [-2.24]	-0.04 [-1.43]	0.04 [0.48]	-0.07 [-0.91]	-0.01 [-0.11]	0.33** [2.23]	0.34** [2.20]
Family Board Over-Representation ( $\beta_4$ )	-0.04 [-1.00]	-0.01 [-0.30]	0.05 [0.50]	0.01 [0.11]	0.09 [0.75]	0.22 [1.29]	0.11 [0.63]
Tunnelling ( $\beta_5$ )	---	---	---	-1.33*** [-8.02]	---	---	---
$E[\text{Tunnelling}]$ ( $\beta_5^*$ )	---	---	---	---	-1.37 [-0.57]	---	---
Observations	290	290	290	290	290	290	290
Adjusted-R Square	17.25	22.74	51.49	60.65	51.37	54.55	69.85
Panel C	Heir vs						

	nonfamily	nonfamily	nonfamily	nonfamily	nonfamily	nonfamily	nonfamily
Family Dummy( $\beta_1$ )	-0.11*** [-2.68]	-0.04 [-1.47]	-0.22*** [-2.67]	-0.24*** [-2.82]	-0.18* [-1.94]	0.44** [2.34]	0.62*** [2.87]
Family' Ownership( $\beta_2$ )	0.23*** [3.02]	0.11** [2.49]	0.55*** [3.60]	0.63*** [4.17]	0.45*** [2.70]	-1.12*** [-3.36]	-1.56*** [-4.04]
Family Leadership( $\beta_3$ )	-0.04 [-1.43]	-0.03 [-1.39]	0.01 [0.22]	-0.003 [-0.05]	0.04 [0.69]	0.17 [1.44]	0.14 [1.00]
Family Board Over-Representation( $\beta_4$ )	0.07* [1.79]	0.02 [1.07]	-0.25*** [-3.30]	-0.23*** [-3.10]	-0.27*** [-3.50]	-0.22* [-1.65]	0.03 [0.15]
The first-order extraction of private benefits via tunnelling ( $\beta_5$ )	---	---	---	-0.65*** [-3.99]	---	---	---
E[Tunnelling] ( $\beta_5^*$ )	---	---	---	---	0.88 [1.35]	---	---
Observations	450	450	450	450	450	450	450
Adjusted-R Square	18.05	18.70	64.50	65.69	64.57	55.55	66.15