

DOCTORAL THESIS

The endogeneity of the separation between the ownership right and control right, evidence from Hong Kong stock market

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**The Endogeneity of the Separation between the Ownership Right and
Control Right, Evidence from Hong Kong Stock Market**

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**A thesis submitted in partial fulfilment of the requirements
for the degree of
Doctor of Philosophy**

Principal Supervisor: Prof. Aris Stouraitis

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July 2017

DECLARATION

I hereby declare that this thesis represents my own work which has been done after registration for the degree of PhD as at Hong Kong Baptist University, and has not been previously included in a thesis or dissertation submitted to this or any other institution for a degree, diploma or other qualifications.

I have read the University's current research ethics guidelines, and accept responsibility for the conduct of the procedures in accordance with the University's Committee on the Use of Human & Animal Subjects in Teaching and Research (HASC). I have attempted to identify all the risks related to this research that may arise in conducting this research, obtained the relevant ethical and/or safety approval (where applicable), and acknowledged my obligations and the rights of the participants.

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ABSTRACT

Numerous studies have used the wedge between control rights and cash flow rights as a proxy for the unobservable likelihood of expropriation (i.e., controlling shareholders tunneling resources from minority shareholders). Therefore, any negative relationship between the wedge and firm value found in previous studies can be interpreted as a relationship between the likelihood of expropriation and firm value. However, the results of this study suggest that the wedge is endogenous and related to firm characteristics, which can be classified into five categories: transparency, the firm's growth and capital requirement, risk, the pledgeability of cash flows and assets, and technology. Based on a sample of 4,185 firm-year observations from 1,202 public firms in the Hong Kong stock market from 2009 to 2013, this study examines whether the wedge remains a good proxy for expropriation if firm characteristics are considered. The results show that the significance of the wedge disappears when it is included alongside firm characteristics in the regressions, meaning that any power of the wedge to explain firm value can be attributed to the effect of these firm characteristics on firm value and not on the effect of the likelihood of expropriation. Moreover, a positive relationship between the wedge and firm value for family-controlled group firms is observed. Therefore, the wedge is not a good proxy for the likelihood of expropriation.

Keywords: control right, expropriation, ownership concentration, wedge

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1 Introduction

In contrast with a dispersed ownership structure, ownership is concentrated in most countries among large shareholders (Claessens, Djankov and Lang, 2000; La Porta, Lopez-De-Silanes and Shleifer, 1999). In such firms, a large shareholder has the incentive to monitor the manager, and thus the classic agency problem between the manager and shareholder documented by Berle and Payne (1933) and Jensen and Meckling (1976) is mitigated. However, the conflict between large shareholders and minority shareholders is apparent, and the extent of the firm's shareholder protection is related to its ownership concentration (Faccio and Lang, 2002). When large shareholders have more control rights than ownership rights, deviating from the "one share, one vote" principle, they may have more incentive to expropriate minority shareholders and entrench themselves (Baek, Kang and Lee, 2006; Claessens, Djankov, Fan and Lang, 2002; Joh, 2003).

The separation of ownership rights and control rights is extensively found in most countries, and especially in East Asia (Claessens, Djankov and Lang, 2000) and Western Europe (Faccio and Lang, 2002). Generally, three mechanisms can be used to achieve disproportionate ownership: multiple voting class shares, which are typically adopted by U.S. corporations (Masulis, Wang and Xie, 2009); the pyramid structure; and the cross-shareholding structure used in family group firms (Almeida and Wolfenzon, 2006). This study focuses on the pyramid structure.

Studies have argued that large shareholders expropriate minority shareholders through tunneling activities, they tunnel resources from firms where they have little ownership to firms where they own high cash flow rights (Baek, Kang and Lee, 2006;

Mitton, 2002). Numerous studies use the wedge as a proxy for the unobservable likelihood of expropriation (tunneling). Therefore, studies have interpreted any negative relationship between the wedge and firm value as a relationship between the likelihood of expropriation (tunneling) and firm value (Claessens, Djankov, Fan and Lang, 2002; Lins, 2003; Maury and Pajuste, 2005). However, other results have suggested that the wedge is endogenous and related to firm characteristics. This study shows that any explanatory power of the wedge for firm value can be attributed to the effect of these firm characteristics on firm value (i.e., the significance of the wedge disappears when included alongside firm characteristics in the regressions) and not on the effect of the likelihood of expropriation. Therefore, the wedge is not a good proxy for the likelihood of expropriation.

According to a theoretical prediction of Almeida and Wolfenzon (2006), large shareholders tend to control firms with low pledgeability of cash flows and assets indirectly in a group due to its financial advantage, and this indirect control leads to the separation between ownership rights and control rights. This study follows the theoretical evidence of Almeida and Wolfenzon (2006) and the empirical evidence of Almeida, Park et al.(2011), Masulis, Pham et al (2011) and Bena and Ortiz-Molina (2013). Based on the factors associated with ownership concentration (Demsetz and Lehn, 1985; Richter and Weiss, 2013), group affiliation (Attig, Fischer and Gadhoun, 2004; Villalonga and Amit, 2006), and pyramid position (Almeida, Park, Subrahmanyam and Wolfenzon, 2011; Masulis, Pham and Zein, 2011), the factors associated with wedge between ownership rights and control rights are identified, and the value effect of the wedge is examined after considering these factors.

Firm characteristics can be classified into five categories: transparency, the firm's growth and capital requirement, risk, the pledgeability of cash flows and assets, and technology. This study uses panel data of Hong Kong public firms from 2009 to 2013 to examine the firm characteristics that influence the wedge of firms, and finds that high wedge firms are associated with good transparency, low leverage, low risk, and low pledgeability of assets for the whole sample, including group firms and non-group firms. In addition, this study examines the characteristics that are important for family group firms. Younger and small family group firms with low leverage, low risk, low pledgeability of cash flow, and high R&D expense tend to be associated with a high wedge.

The value discount of the wedge is replicated when using the model of Claessens, Djankov et al (2002). However, after adding firm characteristics to the model, the significance disappears. For family group firms, a positive relationship is found between the wedge and firm value, thereby implying that the wedge is not a good proxy for expropriation as many studies have found.

It appears that no study has directly examined the factors associated with the separation of ownership rights and control rights, and control variables in previous studies for the value effect of the wedge cover only a few of the factors, yet omitting variables causes an endogeneity problem and presents false results. This is the first paper that tries to address all the factors associated with wedge between ownership rights and control rights, these factors are identified when they are related to ownership concentration, group affiliation and pyramid position. Although negative relationship between wedge and firm value is found in most studies, some studies found that wedge has no significant effect on firm value in some countries (Barontini

and Caprio, 2006; Ben-Amar and André, 2006; Cronqvist and Nilsson, 2003; Wiwattanakantang, 2001), this study extend prior research on value effect of ownership structure, give a reasonable explanation on the mixed results of previous studies. Besides, this study extends prior research on expropriation of minority shareholders, proves that ownership wedge is endogenous and cannot be a good proxy for expropriation.

The remainder of this study is organized as follows. Section 2 provides the literature review and research questions. Section 3 presents the data and variable descriptions. Section 4 presents the factors associated with wedge and its value effect for all firms. Section 5 presents the factors associated with wedge and its value effect for family-controlled firms, including family-controlled group firms. Section 6 presents robustness checks and additional tests. Section 7 offers a conclusion.

2 Literature Review

2.1 Widespread separation of control rights and cash-flow rights

2.1.1 Mechanism used to control firms with disproportionate ownership

Unlike the prevalent dispersed ownership structure found in the U.S., most publicly traded firms around the world adopt a concentrated ownership structure. Large shareholders control firms in three major ways: through multiple voting class shares, the pyramid structure, and the cross-shareholding structure. Adams and Ferreira (2008) state that other mechanisms, including ownership dispersion, and fiduciary voting exist to separate ownership rights from voting rights.

Having multiple voting class shares means that companies issue multiple classes of common stock, usually two classes called dual-class shares, and assign more voting rights for one share to one class of stock than the other. For instance, Google issued dual-class shares when it went public with an IPO in 2004, in which Class B shares were owned by the founders and management with 10 votes per share and Class A shares followed the “one share, one vote” principal. In 2007, Institutional Shareholder Services (ISS), Shearman & Sterling LLP and the European Corporate Governance Institute (ECGI) surveyed the proportionality between ownership rights and control rights across 16 European countries. The survey revealed that 24% of firms used dual-class shares, including approximately 59% of corporations in Sweden, 58% in France, and 41% in the Netherlands. However, in countries such as Belgium and Italy, no company was involved in this kind of ownership structure, and even in the U.S., approximately 6% of publicly traded corporations adopted multiple class shares (Gompers, Ishii and Metrick, 2010).

La Porta, Lopez-De-Silanes et al. (1999) investigate 27 rich countries and find that 26% of companies in their samples are controlled by large shareholders through a pyramid ownership structure compared with 3% controlled by a cross-shareholding structure. The survey conducted by ISS and ECGI identified the pyramid structure as the most commonly used mechanism (27%). Claessens, Djankov et al. (2000) document that at a 20% ultimate control level, 38.4% of corporations are controlled through the pyramid structure, the most frequently used mechanism in Asia.

Under a cross-holding structure, firm A holds a stake in firm B, which in turn has ownership in firm A or more than two firms in cross-shareholding loops. In their sample of nine Asian countries, Claessens, Djankov et al. (2000) find that only Malaysia and Singapore have significant cross-holding structures, with 14.9% and 15.7%, respectively. This mechanism is less used in European countries. Faccio and Lang (2002) study 13 Western European countries and find that only 0.73% of firms are controlled by the cross-shareholding structure, with the highest fractions being 2.69% in Germany and 2.04% in Norway. However, Almeida, Park et al.(2007) propose two methods for measuring the voting rights of a controlling shareholder in a group, and using data on Chaebol firms in Korea, find that firms using cross-shareholding loops occupy 25% of the firm-years in their database.

2.1.2 Separation of ownership rights and control rights around the world

Faccio and Lang (2002) trace the control chains of 13 Western European countries, including Austria, Belgium, Finland, France, Germany, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, and the U.K., at a 20% threshold. The authors find that widely held firms are more common in the U.K. and Ireland, comprising 63.08% and 62.32% of firms, respectively. The situation is reversed in Austria,

Belgium, France, Germany, Italy, Portugal, and Spain, in which more than half of all corporations are family controlled. In their sample, financial firms are more likely to be controlled by a widely held financial institution and less likely to be controlled by a family. The author also show that firms in Spain, Portugal, and France have the highest mean ratio of ownership rights to control rights (O/C ratio), whereas firms in Switzerland, Italy, and Norway have the lowest ratios of 0.74, 0.743, and 0.776, respectively. The lowest O/C ratio in Switzerland is a result of premium voting rights, as the average minimum portion of ownership with 20% control is 15.26%. In Norway, using multiple voting shares is restricted, so the low O/C ratios in Norway and Italy are the result of family control.

Many studies have indicated that the legal environment is important for a firm's ownership structure (Claessens and Fan, 2002; Shleifer and Vishny, 1997). La Porta, Lopez-De-Silanes et al. (1999) study concentrated ownership around the world, focusing on the largest 20 companies in 27 wealthy economies, to identify the principal owners. They conclude that approximately one -third of the companies are widely held, 30% are family controlled, and 18% are state controlled at a 20% control level. In countries with good shareholder protection, widely held firms are prevalent, and firms tend to be controlled by widely held corporations. In countries with poor shareholder protection, firms are controlled by families, the state, and financial institutions, and approximately 31% of firms use the pyramid structure as a significant mechanism to separate ownership rights and control rights, the percentage in countries with good protection is 18%.

Most studies of the discrepancy between cash-flow rights and voting rights have focused on the Asian market because of the popularity of family-controlled firms in

this region. Based on a study by La Porta, Lopez-De-Silanes et al. (1999), Claessens, Djankov et al. (2000) examine the situation in nine East Asian countries including Hong Kong, Indonesia, Japan, South Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand. They find that, at the 10% threshold, firms in Japan, Indonesia, and Singapore display the highest discrepancy between cash-flow rights and control rights compared with firms in the Philippines and Thailand, which have the lowest discrepancy. Furthermore, they find that at 20% threshold, family-controlled corporations have a lower O/C ratio in all countries except Japan and Singapore. In Japan, widely held corporation-controlled firms show a high separation of cash-flow rights and voting rights, with an O/C ratio of 0.495. In Singapore, state-controlled firms tend to have a low O/C ratio of 0.685.

2.2 Literature on the expropriation of minority shareholders

The pyramid structure is related to three aspects: concentrated ownership, a business group, and distance between the controlling shareholder and firm. Studies of the motivation to construct the pyramid structure and its effects have focused mainly on these three aspects.

2.2.1 Large shareholders expropriate minority shareholders through tunneling

As concentrated ownership and disproportionate ownership endow large shareholders with control power without offering commensurate capital investment, large shareholders have an incentive to expropriate external shareholders through tunneling activities.

Bertrand, Mehta et al. (2002) conclude that group firms tunnel resources from firms in which large shareholders have low cash-flow right to firms in which large

shareholders have high cash-flow rights. Because they find that the performance of firm with high cash-flow rights is sensitive to their own shock and less sensitive to the shock of other member firms, but the performance of firms with low cash flow right exhibits the reverse situation.¹ Bae, Kang et al. (2002) indicate that when group firms with high inside ownership and good prior performance act as bidders in M&A, the acquisition return of the acquiring firm is negative, but the return and value change of other member firms in the same group are positive, thereby suggesting that controlling shareholders divert resources from the acquiring firm to other firms and themselves.² Baek, Kang et al.(2006) provide evidence of the tunneling activities by studying the private security offerings in Korea chaebols. Cheung, Rau and Stouraitis (2006) directly examine connected transactions between firm and its controlling shareholder, and found that firms undertaking connected transactions trade at discounted valuations prior to the expropriation, suggesting that investors cannot predict expropriation.

2.2.2 Legal system can be used as a proxy for expropriation

La Porta, Lopez-de-Silanes, Shleifer and Vishny (2002) provide indirect evidence that large shareholders expropriate minority shareholders. They use data from 27 rich countries to examine the effects of shareholder protection and large shareholder ownership on corporate value and conclude that either high ownership or high shareholder protection is associated with high firm value. Their results are consistent with research by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) and La

¹ In contrast, Siegel and Choudhury (2012) estimate the model adopted by Bertrand, Mehta et al.(2002) using more accurate and consistent data. They take into account the business strategy of the group firm and obtain opposing results.

² However, cross-shareholdings are prevalent in their sample.

Porta, Lopez-de-Silanes, Shleifer and Vishny (2000b) that stresses the importance of law and enforcement in corporate governance.

The separation between cash-flow rights and control rights is observed more often in countries with poor investor protection, providing additional evidence of the wedge as a possible expropriation mechanism.

2.2.3 Wedge is used as a proxy for expropriation

As to the wedge between control rights and cash-flow rights, the main view is that this wedge is associated with the entrenchment of the controlling shareholder. Most of the evidence emphasizes that a large wedge leads to a lower firm value. Claessens and Fan (2002), and Lins (2003) identify a negative relationship between the wedge of control rights and cash-flow rights and Tobin's Q in East Asian countries. They conclude that the positive effect of cash-flow rights on Tobin's Q is a result of the incentive effect, with minority shareholders regarding the high ownership of large shareholders as a trustworthy commitment (Gomes, 2000), and that the negative effect of the wedge is due to the entrenchment effect. Maury and Pajuste (2005) and Villalonga and Amit (2006) obtain a similar result based on data from Finnish companies and large U.S. firms, respectively. Mitton (2002), Lemmon and Lins (2003), and Baek, Kang et al., (2004) measure firm performance with stock returns over a crisis period, and find that firms with large shareholders who have more control rights than cash-flow rights experience lower stock return. This indicates that controlling shareholders are encouraged to expropriate minority shareholders when a wedge exists between control rights and cash-flow rights. However, Mitton finds no significant effect when more control variables are included in the regression. Joh (2003) reports the effect of ownership structure on a firm's accounting profitability,

and observes that a large control -ownership disparity is associated with low accounting profitability. Attig, Fischer et al. (2004) show that a firm is affiliated with a group due to limited liability, and that the pyramid structure is created when the controlling shareholder extracts private benefits from the firm. Connelly, Limpaphayom et al (2012) examine Thailand family firms after the 1997 financial crisis and discover that the pyramid structure has a negative moderating effect on the positive effect of corporate governance on firm value. Harvey, Lins et al.(2004) show that internationally syndicated term loans can mitigate the negative effect of the ownership wedge on firm value.

Wedge can be created in pyramid structure and the pyramid structure is a control mechanism in the business group. It is helpful to understand the effect of group affiliation on firm value. There are benefits and costs of being a group affiliated firm, and the internal capital market of a group is one of the advantages of group affiliation when the external market is defective(Stein, 1997). Furthermore, super governance in a group such as an LBO association is a positive aspect of being a group-affiliated firm (Khanna and Palepu, 2000; Khanna and Palepu, 2000). However, the agency problem can result in a misallocation of resources in a conglomerate organization(Rajan, Servaes and Zingales, 2000; Scharfstein and Stein, 2000), and group affiliates can cause an agency cost between controlling and minority shareholders. Controlling shareholders may take actions that benefit themselves regardless of the benefit to minority shareholders. Empirical evidence of the effect of group affiliation on firm value is ambiguous. Perotti and Gelfer (2001) indicate that Russian groups controlled by banks reallocate capital better than industry groups and other independent firms. Khanna and Rivkin (2001) find that in six of their sample of

fourteen countries, group-affiliated firms have a positive relationship with profitability. However, they also find a negative relationship in three countries and no significant relationship in the remaining countries. Lins and Servaes (1999) and Lins and Servaes (2002) found that diversification discount in firms is related to industry groups. Khanna and Palepu (2000) showed that group-affiliated firms outperform stand-alone firms when the group is highly diversified. Bae, Kang et al. (2002) studied the bidding firms in M&A in Korea, and found that group-affiliated bidding firms with higher concentrated ownership experience lower CAR compared with stand-alone bidding firms. Claessens, Fan et al. (2006) investigated the benefit and cost of group-affiliated firm by examining the value effect of group affiliation with different firm characteristics. They found that the value gain is positive for mature, low growth and financially constrained firms in the group, and this gain is mainly driven by firms with a large ownership wedge, indicating that the agency cost of group affiliation is greater than the benefit of internal capital market.

2.2.4 Other proxies for expropriation

Based on the entrenchment and expropriate hypothesis, other studies have presented evidence of how disproportionate ownership influences dividend policy (Faccio, Larry and Young, 2001; Gugler and Yurtoglu, 2003),³ leverage (Du and Dai, 2005; Faccio, Lang and Young, 2009), diversification (Claessens, Djankov, Fan and Lang, 1999), the informativeness of accounting earnings (Fan and Wong, 2002), and the sensitivity of a firm's capital investment to its cash flow (Wei and Zhang, 2008).

³ They find that a higher ownership wedge is associated with a lower dividend because the controlling shareholder diverts private benefits from the dividend. Almeida, Park et al.(2011) find no relationship between the firm's position in the group and the dividend payout ratio.

2.3 Factors related to group affiliation and pyramid position and other result on the relationship between wedge and firm value

2.3.1 Factors related to ownership concentration, group affiliation and pyramid position

In a group, controlling shareholders hold the majority of ownership. Studies have attempted to explain the variation in ownership concentration from the country, industry and individual firm levels.

Looking at country-level differences, as the common law system provides better protection of minority shareholders than the civil law system, ownership concentration is frequently observed in civil law countries (La Porta, Lopez-De-Silanes and Shleifer, 1999; La Porta, Lopez-de-Silanes, Shleifer and Vishny, 1998). Faccio and Lang (2002) discover that ownership concentration is associated with the extent of shareholder protection. However, Holderness (2009) finds no evidence that U.S. firms are more dispersed than firms in other countries. Spamann (2010) corrects the “anti-director rights index” which is used to reflect the degree of shareholder protection, and finds no significant relationship between shareholder protection and ownership concentration. Pedersen and Thomsen (1997) argue that a diffuse ownership is positively related to the size and liquidity of the stock market.

Looking at the industry level, as industry regulations monitor and restrict firms’ behavior, less concentrated ownership is observed in regulated industries (Bergström and Rydqvist, 1990; Demsetz and Lehn, 1985).⁴ Van der Elst (2004) finds that the ownership concentration within industries varies across countries. Thomsen and

⁴ Gedajlovic (1993) and Crespí-Cladera (1996) find that industry relationships have no significant effect on ownership concentration.

Pedersen (1998) investigate the European market and demonstrate that family ownership is concentrated in the following industries: shipping, department stores, other retailing, textiles, and clothing. They indicate that six industry characteristics including average firm size, industry growth rates, capital intensity, earnings volatility, research intensity, and profit margins, can explain 58% of the industry effect.

Looking at the individual firm level, Demsetz and Lehn (1985) document the ownership concentration using U.S. firms as their sample. They find that firm size exhibits a negative effect on the degree of ownership concentration, and that a large firm size incurs a high market value of a given percentage of shareholdings, thereby causing a low level of ownership concentration.⁵ The relationship between control potential and ownership concentration is nonlinear and exhibits an inverted U-shape. Bergström and Rydqvist (1990) and Richter and Weiss (2013) obtain a similar result. Claessens et al (2000) report the statistics of the factors (age and size) related to concentrated control and show that the correlation between age and control stake are positive in all of their sample countries except Japan, where firms exhibit a negative relationship. Furthermore, they find that family control is larger in smaller firms in most Asian countries.

In terms of the importance of these three kinds of ownership concentration, Richter and Weiss (2013) find that firm and country-level characteristics mainly explain the variation in ownership concentration, and that industry-level characteristics explain less.

⁵Gedajlovic (1993) finds consistent results with respect to firm size.

Prowse (1992) borrows the methodology of Demsetz and Lehn (1985) to compare the firm characteristics of firms affiliated with *keiretsu* groups with independent firms. They state that unlike U.S. firms and independent firms in Japan, the ownership concentration of member firms within *keiretsu* groups is not an alternative way to monitor and influence management, due to the strong trading relationship between these *keiretsu* firms. Empirical evidence shows that neither firm size nor profit rate variation has a significant effect on ownership concentration.

The pyramid structure is not the only control mechanism large shareholders can use, if many options available, and then what kind of firms will choose the pyramid structure? Villalonga and Amit(2006) identify that firms that frequently use voting agreement, with high family holdings and pertaining to non-first generation corporations, firms with lower Tobin's q, higher idiosyncratic risk, and lower capital expenditures are inclined to use the pyramid structure. Almeida and Wolfenzon (2006) use the theoretical model to show that firms with a high investment cost, firms with low profitability, and firms in areas with poor investor protection are more likely to use the pyramid structure. Attig, Fischer et al. (2004) conclude that the determinants of a firm affiliated with a pyramid holding include its size, investment policy, dividend payout ratio, risk taking, leverage, and free cash flow. Friedman, Johnson et al. (2003) find that firms controlled through the pyramid structure in a group have a high degree of leverage.

Several studies have attempted to determine what kinds of firm are large shareholders inclined to organize in the top (bottom) of the pyramid structure. Fan et al. (2005) examine the determinants of the scale of pyramids in China. Their sample includes local government-controlled firms and private firms controlled by

individuals. The authors determine that firm size, growth, and financial leverage are related to a firm's position in the pyramid.⁶ Claessens et al (2000) conduct descriptive analysis and find that although firm size is associated with the ownership wedge, the sign of the relationship differs across countries. Lemmon and Lins (2003) conclude that expropriation occurs in firms with high cash flow leverage in periods with poor investment opportunity, and that in better conditions, the degree of expropriation is small. Claessens et al. (2006) find that firms with a highly disproportionate ownership structure are younger than those with less disproportionate ownership in a group. Attig, Fischer et al (2004) study the determinants of the wedge between control rights and cash-flow rights, and argue that the determinants include dividend payout ratio, liquid stocks, leverage, size, aggressive risk, and excess cash. Harvey, Lins et al.(2004) use cash-flow right leverage (control right/cash-flow right) as a dependent variable in their three-stage least squares model and find that firm size has a negative effect on the C/O ratio, that leverage is positively related to the C/O ratio, and that other independent variables including Tobin's Q, asset tangibility and beta have no significant effect on C/O ratio. Almeida, Park et al. (2011) argue that controlling shareholders place a new firm with a low pledgeability of cash flows or a low NPV under a firm that is already owned by a large shareholder. This argument is confirmed by Bena and Ortiz-Molina (2013) and Masulis, Pham et al.(2011). Siegel and Choudhury (2012) show that firms at the top and bottom of the pyramid have different business models, thereby suggesting that they have different characteristics. Bena and Ortiz-Molina (2013) find that aside from the investment requirement and

⁶ A government-controlled firm exhibits no separation between control rights and cash-flow right sin a pyramid because local governments are not allowed to sell shares of the firm they control.

pledgeability of cash flows, technology factors determine whether a new firm should be controlled by a holding firm owned by a controlling shareholder. Masulis, Pham et al.(2011) find that compared with firms at the bottom of the pyramid, which benefit from the internal fund, firms located at the top tend to be older and have lower degrees of risk and investment intensity.

2.3.2 No value effect of wedge for some countries

Firms have other means of separating control rights and cash-flow rights than the pyramid structure, such as constructing a dual-class structure. However, it does not appear that placing more restrictions on dual-class structure would increase the use of the pyramid structure, as firms remain organized in the pyramid structure even when restrictions are placed on dual-class shares (Bianchi, Bianco and Enriques, 2001). Franks and Mayer (2001) use 25%, 50%, and 75% as control threshold levels and find that only 10 firms in 33 pyramids straddle the relative critical control level, thereby concluding that the pyramid structure is not a mechanism used to achieve control. Lefort and Walker (1999) find that large shareholders have an average cash flow right of 57% in 1998 in Chile, a higher amount than needed to achieve control. In some cases, the separation is not very large. Valadares and Leal (2001) show that the pyramid structure is not a way to separate the ownership rights and control rights of Brazilian companies. Demirag and Serter (2003) study disproportionate ownership based on the 100 largest listed companies in Turkey and observe that although the pyramid structure is widely used and the ownership concentration is very high, the control leverage is 1.2, lower than the level seen in other studies. The authors state that the main reason for a firm to use the pyramid structure is to raise external investment without losing control. As for the value effect, Cronqvist and Nilsson

(2003) use panel data of Swedish firms, and observe an entrenchment effect based on the negative correlation between control rights and Tobin's Q, however, they find no negative effect of the wedge on firm value.⁷ Friedman, Johnson et al (2003) state that controlling shareholders can prop up a firm with debt commitment. Bianco and Nicodano (2006) negate the expropriation hypothesis through evidence that indicates that, in contrast to bottom firms, top firms hold more external debt to commit lower risk.

Thus, aside from control and expropriation, wedge can related to firm characteristics. Almeida and Wolfenzon (2006) show that the controlling shareholder may add a new firm to a business group because the security benefit of the new firm is less than its capital requirement. The authors argue that the pyramid structure is associated with a high degree of diversion that results from the selection effect and not from the pyramid structure itself. According to the selection effect, it is the optimal choice for selecting a high investment requirement and attracting low revenue firms to the pyramid when investor protection is low. Based on this argument, the authors examine the empirical implications of their theoretical model and find that controlling shareholders place a firm in the pyramid structure according to its characteristics, and that firms that hold a substantial equity in other group firms are of lower value (Almeida, Park, Subrahmanyam and Wolfenzon, 2011). Khanna and Palepu (2000) claim that the capacity of a group to fund an established group firm by

⁷ Wiwattanakantang (2001) studies the mechanisms used to separate voting rights and cash-flow rights of Thai firms, and finds that pyramid and cross holding had no significant effect on firm value (ROA and Tobin's Q). Barontini and Caprio (2006) examine corporations in 11 countries across continental Europe and find that family control has positive effect on firm value, especially if the firm is managed by family members. Ben-Amar and André (2006) find no negative effect of the separation dummy on the abnormal return of acquiring firms in Canada.

using the cash flows of other group firms is limited when the group is made up of public firms. One of the most crucial functions of a group is to identify new ventures in which the large shareholder and its affiliated firms acquire equity stakes.

2.4 Endogeneity of ownership structure

Cho (1998) conducts simultaneous regression and finds that firm value influences ownership structures, indicating that ownership structures are endogenous determined.⁸ Claessens et al (2002) address the possibility of reverse causality in their analysis of the robustness of their studies of the influence of the wedge between cash-flow rights and control rights. They emphasize that reverse causality is unlikely to occur due to the stability of ownership structures. However, the business group evolves through newly added affiliated firms under firms already owned by large shareholders (Aganin and Volpin, 2005). Maury and Pajuste (2005) examine the frequency of changes in the largest shareholders' control rights and indicate that some changes are greater. Bennedsen and Nielsen (2010) explain why reverse causality does not work in their research. In situations where the controlling shareholder is more likely to choose disproportionate ownership when the investment opportunity is poor, the ownership concentration should be higher. However the authors observe a lower ownership concentration. In addition, they do not find a higher frequency of disproportional ownership firms in Southern Europe, where firms have a low firm value on average. Unlike other researchers, Almeida, Park et al. (2011) address endogeneity indirectly and find that the causality for profitability and pyramid position is reversed. They argue that controlling shareholders place low profitability

⁸ The author tests the insider ownership, not the wedge of cash-flow rights and control rights.

firms at the bottom position in the pyramid, and that it is not the pyramid that causes low profitability. Thus, the true relationship between firm value and the separation between ownership and control rights is unclear. Masulis, Pham et al. (2011) similarly find that firms at the bottom of the pyramid have a higher Tobin's Q than firms at the apex of the pyramid. Bianco and Nicodano (2006) find that holdings companies have more external debt than subsidiaries aside from leverage, which they consider a lower risk commitment. Such evidences are contrary to the expropriate and tunneling hypothesis.

Some studies have addressed the endogeneity problem by finding the proper IVs. Lins (2003) uses the 2SLS model to examine the probable endogeneity problem. In the first-stage regression model, he includes leverage ratio, Tobin's Q, country dummy, industry dummy, assets, and alpha and beta (IV). The structural model result still shows a negative relationship between cash flow leverage and firm value. However, in the first stage of the regression model, beta is insignificant, and in the second stage, firm size is excluded. Maury and Pajuste (2005) use the lagged value of the C/O ratio as the IV and still find that the C/O ratio has a significant effect on firm value. Cronqvist and Nilsson (2003) control endogeneity issues by adding more observable firm characteristic variables, time dummies, and fix firm effects in the regression model. The control variables include firm size, firm size squared, leverage, sales/total assets, PPE/total assets, and CAPEX/total assets.

2.5 Research questions

According to the literature review, previous evidence of the separation between control rights and cash-flow rights that strengthens the entrenched effect of the

controlling shareholder is ambiguous. First, the value effect of the ownership wedge is inconsistent across different studies. Second, the deviation between control rights and cash-flow rights can be achieved through different mechanisms, that have different inherent principles. The motivation of the pyramid can be the benefit of the internal capital market. Although the ownership wedge creates an agency cost between controlling and minority shareholders, the benefit may dominate the cost, and the pyramid may create value for shareholders. This benefit of the pyramid structure may not be observed for dual-class shares and cross-shareholdings structure (Masulis, Pham and Zein, 2011). It is better to study the different control mechanisms separately. Third, an endogeneity problem exists, as firm characteristics influence ownership concentration, group affiliation and pyramid position. Studies that fail to include these characteristics may create a spurious relationship between the ownership wedge and firm performance, and the conclusion will not be convincing.

This study focuses on the Hong Kong market and attempts to answer the following questions:

1. What kinds of firm characteristics influence the wedge?
2. Considering all of these characteristics, what is the value effect of the separation between cash-flow rights and control rights? Whether previous evidence on value discount of wedge still can be found?
3. What are the differences between the characteristics of different kinds of firms, such as family-controlled, family-controlled group, and state-owned firms?

3 Data Description

3.1 Data sources

All of the ownership data for public firms on the Hong Kong stock market were collected from their annual reports, which were downloaded from either HKEXnews⁹ or the company's website.

The Hong Kong stock market is appropriate for conducting this study for following three reasons. Firstly, Hong Kong market is dominated by family controlled firms with pyramid structure, and as small number of cases with cross-shareholding can be found, the result of this study is not disturbed by other control mechanism, family controlled firm occupy 79% of the sample in this study, and about 18% of family controlled firms are owned through at least one firm in the sample. Secondly, according to Part XV of the Securities and Futures Ordinance, companies should disclose and register their interest in shares and short positions. This study can get access to annual ownership data from two parts in the annual report: the director's interest and the substantial shareholder. Thirdly, this study follows the model of Claessens, Djankov, Fan and Lang (2002), and Hong Kong market is one economy sample in their study, and the regression results on the relationship between firm value and the largest shareholder's ownership and control for Hong Kong (Table VI) shows that wedge is associated with lower valuation at 5% significant level, which is consistent with the result for the whole sample.

In the main part of this study, 10% control level is applied. After checking the footnote for the director's interest and the substantial shareholder, a search was

⁹ http://www.hkexnews.hk/listedco/listconews/advancedsearch/search_active_main.aspx

conducted for the direct largest shareholder who owned more than 10% of the shares, and if this shareholder was a company, search was conducted for this company's largest shareholder until a company owned by an individual, by a company with no substantial holdings larger than 10%, or by the government was found. Afterwards, a picture of ownership structure of the firm was drawn to calculate the cash-flow rights and control rights. Data from the Osiris Database were also used as complementary data to check the ownership structure. If the largest shareholder was a private firm, the ownership structure diagram provided by Osiris was consulted. Firms were excluded if their ultimate largest shareholders could not be traced. All of the financial data were collected from DataStream and Bloomberg. As this study focuses on the pyramid structure, firms with the cross-shareholding structure are excluded from the sample.

3.2 Example illustrating the calculation of cash-flow right, control rights, and the wedge

Consider Power Assets Holdings Limited (HK Stock Code: 6) as an example to illustrate the calculation of cash-flow rights and control rights for the sample firms. Based on the information disclosed in the Annual Report in 2013 and Osiris2013, Figure 1 shows a picture of the company's ownership structure in 2013.

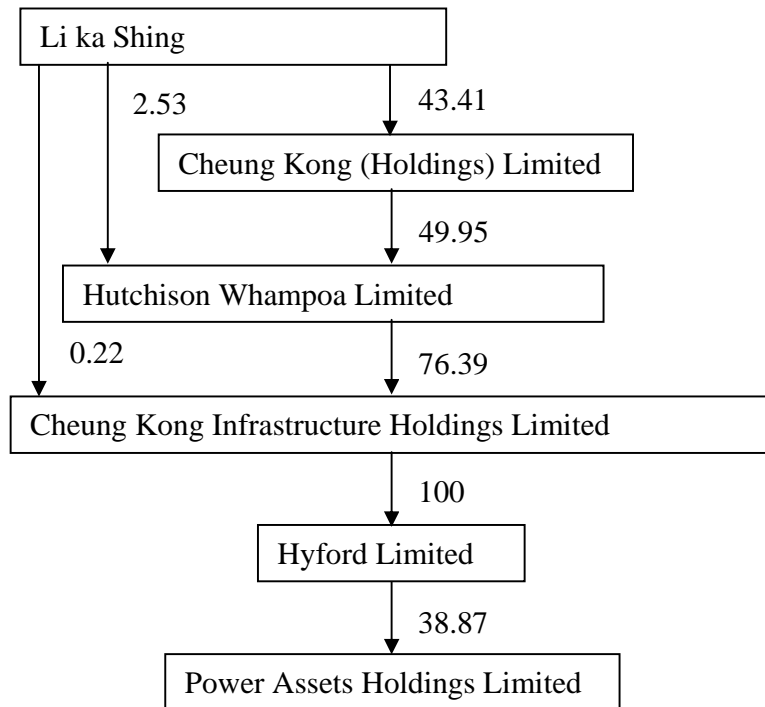


Figure 1 Ownership Structure of Power Assets Holdings Limited

As shown in Figure 1, a pyramid structure is evident. Li Kashing is the ultimate owner of Power Assets Holdings Limited, and has both direct and indirect cash-flow rights for the shareholders of Cheung Kong Infrastructure Holdings Limited and Hutchison Whampoa Limited. Based on the method adopted by Claessens, Djankov et al.(2000),¹⁰ the control right is calculated as the weakest link along the pyramid chain, and the cash-flow right is the product of ownership along the pyramid chain where more than two chains exist. If both direct and indirect ownerships exist, then the total cash-flow rights is the sum of both, and the control rights is the minimum

¹⁰ The method of calculating cash-flow rights and control rights in a pyramid structure is consistent through all studies. The exceptions are studies by Almeida, Park et al.(2007) and Almeida, Park et al.(2011), who create their own metric to calculate the ownership variables due to high number of cross-shareholding structures in their samples. Their method can also be applied to the pyramid structure and obtain similar results.

number that counts direct and indirect shareholdings. Thus, based on Figure 1, the cash-flow right is calculated as follows:

$$\text{Cash-flow Right} = [(43.41\% \times 49.95\% + 2.53\%) \times 76.39 + 0.22] \times 38.87\% = 7.28\%$$

The control right is calculated as follows:

$$\text{Control Right} = \min(43.41\%, 43.41\% + 2.53\%, 43.41\% + 0.22\%, 38.87\%) = 38.87\%$$

The wedge is calculated as the difference between control right and cash-flow right:

$$\text{Wedge} = 38.87\% - 7.28\% = 31.59\% .$$

3.3 Firm characteristics and variable definition

As factors associated with disproportionate ownership, the firm's observable characteristics can be classified into the following groups: transparency, the firm's growth and capital requirement, risk, the pledgeability of cash flows and assets, and technology.

3.3.1 Firm characteristics related to transparency

Previous evidence of the entrenchment effect of the ownership structure underlines the control motivation of largest shareholders: the controlling power provides large shareholders with the opportunity to divert resources and extract private benefits from others to benefit themselves. The financial advantage hypothesis shows that a large shareholder's investment in a company is the optimal choice that benefits both the owner and firm even though the firm is controlled through the pyramid structure. Assessing the extent of the transparency of the firm is crucial when examining market evaluations of the pyramid ownership structure (Masulis, Pham and Zein, 2011), and some firms' observable attributes in relation to the transparency level can reflect the controlling shareholder's motivation to own a firm through the pyramid structure. In

this study, age, size, analyst coverage, and dividend payout ratio are used as proxies for transparency. Studies have shown that some of these variables related to ownership.

Firm age_(*Age*): Small investors may intend to invest in well-established companies, thereby indicating a negative relationship between age and concentrated control (Claessens, Djankov and Lang, 2000). A well-established firm exhibits a higher transparency than a younger firm does. In this study, the number of years between the established year and study year is used to measure the age.

Firm size_(*logAssets*): The tunneling hypothesis predicts that large firms are associated with a higher diversion benefit for controlling shareholders (Wolfenzon, 1999), and the financial advantage hypothesis postulates a positive relationship either, which indicates that firms with large investment requirement can be set up in business group (Bena and Ortiz-Molina, 2013). The natural log of total assets in thousands of HK dollars is used to proxy for firm size.

Analyst coverage_(*AnalystCoverage*): The more analysts cover a firm, the lower extent of the firm's information asymmetry (Chang, Dasgupta and Hilary, 2006). Group firms are concerned about their reputation. Thus, they attempt to be visible in the market and eliminate market concerns about expropriating minority shareholders. Group firms may be associated with more analyst coverage. Analyst coverage is calculated as the number of analysts covering a firm.

Dividend policy_(*DividendPayout*): Dividends can be used to limit expropriation from minority shareholders by distributing corporate wealth from large shareholder control (La Porta, Lopez-de-Silanes, Shleifer and Vishny, 2000b). Tightly affiliated group firms pay a higher dividend to alleviate market concerns over large

shareholders diverting private benefits from the controlling firm (Faccio, Larry and Young, 2001). Moreover, dividends can be a way to redistribute group capital resources from the prospect of an internal capital market (Gopalan, Nanda and Seru, 2014). Therefore, dividend payouts can be used to indicate the transparency level. *DividendPayout* is the dividend paid divided by EBIT.

3.3.2 Firm characteristics related to a firm's growth and capital requirement

Capital expenditure (*CapitalExpenditure*): A higher capital expenditure indicates a lower NPV of investment, and the optimal strategy is to place this kind of firm under the firms controlled by the large shareholder (Almeida and Wolfenzon, 2006). Cho (1998) find that capital investment affects the managerial ownership structure, the that relationship between inside ownership and investment is non-monotonic. This study uses capital expenditure scaled by total assets to measure capital expenditure.

Firm growth (*SalesGrowth*): According to financial advantage of group, firms affiliated with a group have opportunities to leverage internal funds to support their growth and use the reputation of the group to undertake big project (Khanna and Palepu, 2000). Hence, a firm's sales growth determines its financial methods and ownership structure. Firms with higher growth prospects may be placed far away from the controlling shareholder (Masulis, Pham et al., 2011). Following Claessens, Djankov et al.(2002), this study uses sales growth in the previous year to measure this variable.

Leverage (*Leverage*): First, the financial advantage hypothesis indicates that group firms can obtain intra-group debt financing with a low bankruptcy cost (Gopalan, Nanda and Seru, 2007; Masulis, Pham and Zein, 2011). Second, the

business group can maintain its controlling power through debt financing (Faccio and Masulis, 2005). Third, high leverage can mitigate market concerns about expropriating minority shareholders. Hence, high leverage in group-affiliated firms can be expected. In this study, leverage is calculated as the ratio of total liabilities to total assets.

3.3.3 Firm characteristics related to risk

Firm risk (*Beta and Idiosyncratic Risk*): The firm owner has a high incentive to control the firm in high volatility situations because management has a greater scope of discretion in unstable environment (Demsetz and Lehn, 1985). Furthermore, management would rather have low ownership in a high risk firm due to the benefit of diversification for a manager's portfolio (Himmelberg, Hubbard and Palia, 1999). Under the expropriation hypothesis, the owner prefers to control high-risk firms with others, as they can share the risk with other shareholders. However, the owner may control low -risk firms through controlled firms, thereby alleviating market concerns on the expropriation. This study measures firm risk with the system risk *beta* by regressing market model with daily stock returns for one year, and using the Hang Seng Index as the benchmark. It also measures firm risk with idiosyncratic risk, which is the standard error of the same market model.

3.3.4 Firm characteristics related to pledgeability of cash flows and assets

Almeida and Wolfenzon (2006) show that when an owner decides whether to own a new firm directly by himself (herself) or indirectly through a firm he (she) already owns, the pledgeability of the firm's cash flows and assets is important. The best choice for the owner is to own the firm directly with a high pledgeability of cash flows and assets, and to own the firm with a low pledgeability of cash flows and

assets through the pyramid structure. Thus, the pledgeability of cash flows and assets affects a firm's ownership structure. Similar to Almeida, Park et al. (2011), this study measures the pledgeability of cash flows using profitability and measures the pledgeability of assets using tangibility and collateral asset.

Profitability_(*Profitability*): Higher profitability indicates a higher cash flow and higher NPV for the firm. Profitability is calculated as the ratio of EBIT to total assets.

Asset tangibility_(*Tangibility*) and **Collateral** (*Collateral*): Higher asset tangibility and collateral indicate a higher pledgeability of assets, allowing the firm to easily obtain access to external financing. These firms are more likely to be closer to the apex of the pyramid. Tangibility is calculated as tangible assets scaled by total assets, and collateral is calculated as the sum of tangible assets and inventory scaled by total assets.

3.3.5 Firm characteristics related to technology

Technology_(*Capital-labor Ratio and Wage*): Bena and Ortiz-Molina (2013) find that new firms with parent companies have high capital-labor ratio and wages. They explain this result is that firms who have high capital-labor ratio and wages depend on large fixed assets and large fund for expensive labor, thus the controlling shareholder uses the parent company fund to support these firms (Almeida and Wolfenzon, 2006).

Capital-labor ratio_(*Capital/labor*) is fixed assets divided by total employment.

Wage (*Wage/Employees*) is total staff cost divided by employment.

This study also includes **R&D** as a proxy for technology, which is calculated as the ratio of R&D to total assets.

3.3.6 Other variables

Firm value_(*Tobin's Q*): Firm value is calculated as the ratio of the sum of the book value of liabilities and preferred stock and the market value of common stock to the book value of total assets.

Director_(*Director*): For family firms, a family member involved in management affects firm performance. Anderson and Reeb (2003) find that family-controlled firms with CEOs who are family members exhibit good performance. *Director* is a dummy variable, that equals 1 when the family members belong to the management group and 0 when none of the management members has a relationship with the controlling family.

All of the variables are defined in the Appendix.

3.4 Sample characteristics

This study collected ownership and financial data of Hong Kong public firms for five years between 2009 and 2013, and all of the data were taken from every fiscal year end. The ultimate largest shareholders and the ownership structures can be mapped for 5,479 firm-year observations. This study refers to the industry classification of Campbell (1996) to determine the industry in which a firm mainly operates.¹¹ Similar to Claessens, Djankov et al. (2002), this study excludes the firms in the financial/real estate industry (SIC 60-69) and regulated utilities (SIC 49). After the firms with missing financial variables are eliminated, the final sample includes

¹¹ The industries include the petroleum industry (SIC 13,29), financial/real estate (SIC 60-69), consumer durables (SIC 25, 30, 36, 37, 50, 55,57), basic industry (SIC 10, 12, 14, 24, 26, 28, 33), food/tobacco (SIC 1, 20, 21, 54), construction (SIC 15-17, 32, 52), capital goods (SIC 34, 35, 38), transportation (SIC 40-42,44 45, 47), unregulated utilities (SIC 46,48), regulated utilities (SIC 49), textiles/trade (SIC 22,23, 31, 51, 53, 56, 59), services (SIC 72, 73, 75, 80, 82, 89), and leisure (SIC 27, 58, 70, 78,79).

1,202 firms (4,185 firm-year observations). 10% is used as the cutoff point to define effective control, and the firms of which no one owns more than 10% are classified as firms with dispersed ownership. The ultimate largest owners are split into three categories: widely held companies (including financial institution), families (contain all family members), and the state. As shown in panel A of Table 1, of the 1,202 firms (4,185 observations), 40 firms (70 firm-years) are dispersed ownership firms where no shareholder owns more than 10% of the shareholdings, and 28 firms (87 observations) are owned by widely held companies, 10 of which are owned with unequal cash-flow rights and control rights. Family-controlled firms occupy the highest percentage in the sample with 73.32%. The owners of 950 firms (3,313 observations) are classified as ultimate family owners, and approximately one-third of the family-controlled firms are owned through disproportionate ownership. The state owns 184 firms (715 firm-year observations), with the percentage of 21.02%, and the state control rights exceeds the cash-flow rights in 213 observations.

Family-controlled firms account for the highest percentage in the sample. This study also examines the value effect of family firms. These firms are classified into group and non-group firms. A firm is placed in a group category if the firm is owned by an individual who owns more than one firm in the sample. Panel B of Table 1 shows that 801 firms (2,694 firm-years) are non-group-affiliated firms, and nearly one-third of these firms are controlled by disproportionate ownership.¹² In addition, 167 firms (619 observations) are classified as group firms, and families have disproportionate ownership of approximately one half of these group firms. The

¹² Non-group firms can still have disproportionate ownership, as the parent firm of these firms may not be listed in Hong Kong or may not be a public firm at all.

largest group contains nine firms with forty-one firm-year observations, and these firms are controlled by Li Kashing's family.

[INSERT TABLE 1 HERE]

Panel C of Table 1 reports the summarized statistics for the ownership structure variables, firm characteristics, and performance variables across all of the firms in the sample. All of the continuous financial variables are Winsorized at the 1% and 99% levels to minimize the outlier effect. The ultimate largest controller owns 42.55% (42.51%) of the cash-flow rights and controls of 46.81% (48.5%) ownership on average (median). These numbers are consistent with data newly assembled for year 2008 in the study by Carney and Child (2013), who show the change of the separation of cash-flow and control right in nine East Asian countries between 1996¹³ and 2008. In their sample of 148 corporations, the cash-flow rights and control rights in 2008 for Hong Kong are 45% (42.85%) and 49.63% (50.06%), respectively. The mean wedge, denoted by the difference between control rights and cash-flow rights, is 4.26%. In this study, the sample covers most of the public firms in the Hong Kong stock market, including small and large firms, and the market capitalization covers 69 million to 268 billion HKD.

Panel D of Table 1 reports the average value of all variables for each firm type. Family controls 46.75% ownership on average, and widely held company and state control 47.45% and 50.8% respectively, family owns smallest amount of cash-flow right (42.47%) among three kind of largest shareholders, widely held company and state own 46.16% and 45.86% respectively, the deviation between control right and ownership for family and state controlled firms is larger than that for widely held

¹³ The 1996 data come from Claessens, Djankov et al. (2000).

company controlled firms. State owned firms is larger than other firms on average, the assets of state owned firms is 65.8 billion, and family controlled firm is 12.7 billion. Widely held company owned firm has high Tobin's Q on average.

As panel data is applied in this study, time series description for ownership structure is shown in Table 2. Panel A of Table 2 shows that the mean value for yearly ownership variables, the largest shareholders own 42.73% cash-flow right in 2009, and the number decreased to 42.45% in 2013. The value of wedge fluctuates during the 5 years, and the value in 2009 is 4.23 and increased to 4.36 in 2013. For some sample firms in this study, the largest shareholders are not constant. Panel B of Table 2 reports the number of observations that large shareholders has changed, the largest shareholder of 64 observations has changed in total, and 21 family controlled observations changed from dispersed ownership, and 18 dispersed ownership observations changed from family controlled ownership structure. Panel C of table 2 presents summary statistics for time series variation of wedge, the mean value of time series variation of wedge is 0.8, and it is not equal to 0 at 1% statistic significant level, which indicate that wedge yearly variation is obvious and panel data is appropriate in this study.

[INSERT TABLE 2 HERE]

Pearson's correlation for the separation between cash-flow rights and control rights (wedge) and firm characteristics is presented in Table 3. The table shows that the wedge is positively related to the variables that serve as proxies for transparency, including age, size, and analyst coverage, and is negatively related to the leverage and risk. Profitability has a positive relationship with wedge, and tangibility and collateral have negative relationships with the wedge. For the variables related to technology,

the wedge is positively related to wage/employees but negatively related to R&D expense. The factors associated with wedge are discussed in detail in the next chapter.

[INSERT TABLE 3 HERE]

4 Factors associated with wedge and value effect of the wedge for all firms

The main mechanisms used to separate control rights from cash-flow rights include multiple voting rights, cross-shareholding, and the pyramid structure (Adams and Ferreira, 2008). As multiple voting rights and cross shareholdings have different value effects than the pyramid structure (Almeida, Park, Subrahmanyam and Wolfenzon, 2011; Masulis, Pham and Zein, 2011), only the pyramid structure is considered as the research objective of this study. The pyramid structure can be used to mismatch control rights and cash-flow rights, thereby implying that large shareholders can entrench themselves and divert private benefits to expropriate minority shareholders. However, the pyramid structure is a method used to form a group that gives an internal capital advantage to its members. Almeida, Park et al.(2007) provide theoretical evidence that whether a large shareholder controls a new firm directly or indirectly through a well-established firm depend on the characteristics of the new firm. Furthermore, previous research has shown that group affiliations and pyramid positions are determined by firm characteristics, and that an endogeneity issue arises when these firm attributes are ignored.

This study borrows the method used by Himmelberg et al.(1999)(HHP), who address the endogeneity of managerial ownership. Himmelberg et al. (1999) argue that managerial ownership is determined by observable and unobservable firm

characteristics that may influence firm performance, and use panel data to capture the unobservable firm effect.¹⁴

Table 4 replicates the model used by Claessens, Djankov et al.(2002) in column 1 using panel data of 4,815 observations taken from the period between 2009 and 2013. It also introduces the year and industry fixed effects in the specification. The results show that the separation between control rights and cash-flow rights is negatively significantly related to firm performance and that the coefficient of the wedge is consistent with the regression results of Claessens, Djankov et al. (2002). The parameters of ownership are positive but not significant, which is different from the results of Claessens, Djankov et al.(2002), who show that ownership has a positive significant effect on firm value. Among the control variables, the results of size and sales growth are similar to the results of Claessens, Djankov et al.(2002). In specification 2, the fixed firm effect is introduced in the model to control the firm-specific variables other than the control variables in column 1. The results show that the relationship between the wedge and firm value is negative but not significant. The significant effect of the wedge on firm performance disappears when the fixed firm effect is added into the model, thereby indicating that when a firm's cross-sectional variation is eliminated, the negative wedge-performance relationship cannot be supported by the annual change in the firm, and some firm characteristics related to

¹⁴ Zhou (2001) questions the use of panel data to control the fixed effect when testing the relationship between ownership and performance. The author argues that as ownership changes slowly, the fixed effect method used to eliminate cross-sectional variation cannot detect the performance effect of ownership. The method used by HHP is borrowed here as a pretest to show that previous evidence changes when firm characteristics are not considered.

the wedge may influence the result.¹⁵ Therefore, the factors associated with wedge are tested in this chapter.

[INSERT TABLE 4 HERE]

4.1 Factors associated with wedge for all firms

In Section 3.3, the financial variables are defined as the factors associated with wedge. These factors are classified into four categories: transparency, the firm's growth and capital requirement, risk, the pledgeability of cash flows and assets, and technology. The transparency category contains the firm's age, size, analyst coverage, and dividend payout ratio. The firm's growth and capital requirement category includes the ratio of capital expenditure to total assets, sales growth, and leverage. The risk category covers beta and the idiosyncratic risk. The pledgeability of cash flows and assets category includes profitability, tangibility, and collateral. Finally, the technology category covers the capital labor ratio, average wage, and R&D expense.

Table 5 examines the corresponding effect of each category factor on the wedge. In column 1 of the transparency category, the results show that all of the variables are positively related to the wedge, where age and size are significant at the 1% level and analyst coverage and dividend are insignificant. The positive significant effect of age and size indicates that mature and large firms tend to be owned through the disproportionate ownership. This result is consistent with that of Khanna and Palepu (2000), who prove that group-affiliated firms are older and larger than standalone firms. High-wedge firms are more likely to attract a high level of coverage and pay

¹⁵ Another possibility is that the wedge-performance relationship exhibits cross-sectional variation. This study tests the effect of wedge on performance when new control variables are added and the year and industry effects are controlled to determine the cross-sectional variation in the following part.

more dividends. The positive relationship between transparency factors and the wedge shows that controlling shareholders attempt to let high wedge firms be visible to the market to alleviate the fear of expropriation, especially for group firms (Faccio, Larry and Young, 2001; Gomes, 2000; Masulis, Pham and Zein, 2011).

[INSERT TABLE 5 HERE]

Looking at the firm's growth and capital requirement category, it can be expected that high-wedge firms have higher capital investment and growth prospects. The results show that capital expenditure is negatively related to the wedge, and sales growth is positively related to the wedge but not at a significant level, thereby indicating that high wedge firms have less capital investment.

According to the financial advantage of the group, group firms can borrow more than non-group firms. Moreover, the risk-sharing benefit among group members decreases the borrowing cost and gives the firm access to debt financing (Khanna and Yafeh, 2005). However, in a pyramid group, the firm at the top of the pyramid may need more debt to support the subsidiaries at the bottom of the pyramid (Masulis, Pham and Zein, 2011). As high-wedge firms are located at the bottom of the pyramid and the low-wedge firms are either the top firms in a group or standalone firms, the relationship between the wedge and leverage cannot be easily determined. However, Faccio, Lang et al.(2009) and Paligorova and Xu (2012) document the relationship between the wedge and leverage directly and find that a high wedge is related to low leverage when creditor right is well protected. The regression results from this study is consistent with their result and provide the evidence that pyramid structure is a control-enhancing mechanism, as pyramid and leverage are substitute ways to achieve control (Ellul, 2008; Jensen, Warner and Stulz, 1988).

Some group firms around the world benefit from risk-sharing in the group (Khanna and Yafeh, 2005).¹⁶ Using control enhancing mechanism choice model, Villalonga and Amit (2006) find that high-risk family firms in the U.S. tend to be controlled through the pyramid structure. For firms within the pyramid, Masulis, Pham et al., (2011) find that bottom firms have a higher idiosyncratic risk and lower systematic risk than top firms. Specifications 3 and 4 state that a high wedge is associated with low systematic and non-systematic risks, respectively, and that the latter association is significant.

Almeida and Wolfenzon (2006) believe that the controlling shareholder makes the decision whether to directly own the new firm or indirectly control the firm through the pyramid structure based on the firm's pledgeability of cash-flows and asset. Following Almeida, Park et al. (2011), this study uses the EBIT of the previous period to examine the pledgeability of cash flows and uses the tangibility and collateral of the previous period to measure the pledgeability of assets. The results of specifications 5 and 6 show that a high wedge is associated with a low pledgeability of assets, thereby indicating the financial advantage of pyramid group structure. However, similar to the studies by Almeida, Park et al., (2011) and Bena and Ortiz-Molina (2013), this study does not identify a negative relationship between profitability and the wedge for the whole sample.

Following the idea of Bena and Ortiz-Molina (2013), this study examines whether firm characteristics are related to technology production factors, such as the capital-labor ratio and average wage. R&D expense is also included in the technology factors.

¹⁶ Khanna and Yafeh (2005) examine the relationship between the standard deviation of profitability and group affiliation in 12 emerging markets. They found that only groups in Korea and Thailand have risk-sharing benefits. For other countries, the results are not consistent.

In contrast to the result of Bena and Ortiz-Molina (2013),¹⁷ the result of specification 7 shows negative relationship between the wedge and capital intensiveness, wage payment and R&D expense, and a significant relationship only for average wage. The negative relationship between the capital-labor ratio and wedge again shows that a high-wedge firm is associated with a constrained financial situation, and can benefit from the financial advantage of the group through the pyramid structure.

In Table 6, all of the factors are placed in one model. Most of the results are consistent with those in Table 5. Analyst coverage is marginally positively significantly related to the wedge, and beta is negatively significantly related to the wedge.

[INSERT TABLE 6 HERE]

4.2 Effect of the wedge on firm performance

Column 1 of Table 7 replicates the model used by Claessens, Djankov et al.(2002), and the result is similar except that the coefficient of ownership is insignificant. The incentive effect of ownership is unobservable in the sample. The significant variables, which are the significant factors associated with wedge¹⁸ in Table 6 are included in specifications 2-5. All of the newly added variables except for tangibility and collateral are significantly related to firm value, and the significant effect of wedge on firm value disappears even though the effect is still negative. The significance of the wedge can be absorbed by variables that are positively related to wedge but negatively related to firm value or vice versa. The factors that conform to these

¹⁷ Bena and Ortiz-Molina (2013) compare the technology factors of a new firm under a parent company with those of stand-alone firms. They do not test the wedge directly.

¹⁸ This study eliminates the capital expense/sales in the model of Claessens, Djankov et al.(2002) in columns 2-6, as capital expense/sales are highly related to capital expenditure. Capital expenditure is maintained in the following model, and the results are similar when capital expense/sales are used.

conditions are capital expenditure, leverage, beta, idiosyncratic risk, tangibility, and average staff cost. This evidence shows that the negative relationship between the wedge and firm value is the result of omitted variables.¹⁹ In column 6, all of the factors associated with wedge in Table 6 are added, and whereas the capital-labor ratio is negatively related to firm value, R&D is positively related to firm value.

[INSERT TABLE 7 HERE]

¹⁹ Other studies examining the relationship between the wedge and value have also used some of these factors. Lemmon and Lins (2003) examine the value effect of management cash flow leverage and include size, leverage, and beta as control variables. Lins (2003) include size, expenditure, and leverage as control variables. Mitton(2002) includes size and leverage as control variables. Maury and Pajuste (2005) include size, leverage, sales growth, and tangibility as control variables.

5 Factors associated with wedge and its value effect for family-controlled firms

In Hong Kong, most firms are family controlled. In the sample used in this study, family-controlled firms constitute 79% of the observations. This study examines factors associated with wedge and value effect of wedge for family-controlled subsample. Compared with firms that have widely held corporations and the state as their largest shareholders, family shareholders have more incentive to expropriate minority shareholders, as the private benefit of control cannot be diluted for the family's largest shareholders (Villalonga and Amit, 2006). However, as the consistent interest between manager and large shareholder is apparent, managerial expropriation is relatively small in family firms, and family shareholders may make effective investment decisions due to a long investment horizon (James, 1999). Some evidence supports the conclusion that family control is associated with better performance (Anderson and Reeb, 2003; Villalonga and Amit, 2006).

Table 8 adds a family dummy and its interaction with the factors associated with wedge discussed in Section 4.1. the results show that family firms have a lower wedge than other firms on average compared with firms controlled by a widely held company and the state. Family-controlled firms decrease the positive effect of age, increase the positive effect of size, decrease the positive effect of profitability, decrease the positive effect of collateral, and decrease the negative effect of average wage on the wedge. Family control causes a firm's characteristics to have different effects on the wedge. The factors associated with wedge for family-controlled firms are discussed in the next section.

[INSERT TABLE 8 HERE]

5.1 All family-controlled firms

5.1.1 Factors associated with wedge for all family-controlled firms

Table 9 presents the results of the factors associated with wedge for family firms. In addition to the factors discussed in Section 4.1, a director dummy is added to the model that is equal to 1 when family members are involved in a firm's management. The results show that although all of the transparency factors have a positive effect on the wedge, only firm size has a significant effect. Capital expenditure, leverage, and risk have a negatively significant effect on the wedge, and these results are consistent with the results for the whole sample. Among the financial advantage factors, only collateral is negatively associated with the wedge at 10% significance level, and the capital-labor ratio has a negatively significant effect on the wedge at a marginal significance level. The new variable, director, is negatively significantly associated with the wedge, indicating that family members are the least likely to participate in the management of a high wedge firm.

[INSERT TABLE 9 HERE]

5.1.2 Value effect of all family-controlled firms

Column 1 of Table 10 replicates the model used by Claessens, Djankov et al.(2002). The results indicate that the wedge continues to have a negative effect on firm value, but only at the 10% significance level. In columns 2 and 3, the significant factors in Section 5.1.1 are added. As a result, the negative effect of the wedge on firm value is no longer significant, and almost all of the newly added variables are significantly related to firm value. Variables that have a positive (negative) relationship with the

wedge and a negative (positive) relationship with firm value influence the results. As such, capital expenditure, leverage and risk change the results in column 1. In columns 3-4, all of the factors in Section 5.1.1 are added, and similar results are obtained.

[INSERT TABLE 10 HERE]

5.2 Family-controlled group firms

This study is most related to the studies by Almeida, Park et al.(2011) and Masulis, Pham et al. (2011), whose study objective is the family group.²⁰ As the sample of family-controlled firms includes both group and non-group firms, it is necessary to examine the factors associated with wedge only for group firms. Consistent with the study by Masulis, Pham et al. (2011), a group is defined as one individual controlling at least two firms in the sample. This definition produces 169 firms and 619 firm-year observations for the family-controlled group firm subsample.

Table 11 includes the group dummy and its interaction with factors in Section 5.1.1. The results indicate that group firms exhibit a lower wedge than non-group firms.²¹ Compared with non-group firms, belonging to a group decreases the positive effect of age, increases the positive effect of size, increases the negative effect of risk, decreases the negative effect of average wage, increase the positive effect of R&D, and increase the negative effect of directors on the wedge.

[INSERT TABLE 11 HERE]

²⁰ The authors test the factors related to a firm's position in a group, in which the firm's position is related to the wedge. In contrast, this study examines the factors associated with wedge directly.

²¹ The non-group firm in the sample could be a group firm when other group members are not listed on the Hong Kong Stock Exchange or are private firms. As no other group member information can be obtained, this kind of firm is defined as non-group firm.

5.2.1 Factors associated with wedge for all family group firms

This section examines the factors associated with wedge only for family group firms. The results presented in Table 12, which are different from the entire sample and family-controlled sample, show that age is negatively related to the wedge. This result is consistent with the evidence provided by Almeida, Park et al.(2011) and Masulis, Pham et al. (2011), who find that firms at the bottom of the pyramid are younger than firms at the top. The other three transparency factors, including size, analyst coverage and dividend payout ratio, have positive effects on the wedge, and only size and the dividend payout ratio are significantly related. Risk is negatively significantly related to the wedge. In contrast to the results for the whole sample and family controlled sample, previous period profitability is negatively significantly related to the wedge. Tangibility and collateral maintain negative relationships with the wedge, but they are not significant. As for the technology factors, the capital labor ratio is significantly associated with the wedge, but wage and R&D are positively related to the wedge, thereby indicating that high technology firms have a higher wedge. Similar to the family-controlled sample, family members are least likely to be involved in the management of a high-wedge firm. Columns 5 and 6 control for the group fixed effect and show that size and capital expenditure are negatively and positively related to the wedge, respectively.

[INSERT TABLE 12 HERE]

5.2.2 Value effect of family group firms

This study examines the value effect of the wedge using the model adopted by Claessens, Djankov et al. (2002) and by adding the factors discussed in Section 5.2.1. The results are presented in Table 13. The results of Claessens, Djankov et al.(2002)

for family group firms cannot be replicated in columns 1-3. The standard error is clustered at the firm level in column 2, and the wedge has no significant effect on the firm value, but the effect is negative. Column 3 uses the same model and controls for the group fixed effect.²² The results show that the wedge has a positive but insignificant effect on firm value. In columns 4-7, the significant factors associated with wedge are added to the model of Claessens, Djankov et al.(2002). Columns 4 and 6 indicate that although adding new variables to the model decreases the standard error of the wedge, the coefficient is negative. However, when the group fixed effect is controlled for in columns 5 and 7, the coefficient of the wedge becomes positive but insignificant. All of the factors in the model are added to columns 8-11, and the group fixed effect is addressed in columns 9-11, in which similar results are obtained. Almeida, Park et al.(2011) and Masulis, Pham et al. (2011) find that in the pyramid group, firms located at the bottom have a higher value than the firms at the top, thereby indicating the financial advantage for the high-wedge firm. After controlling for the unobservable group characteristics, a similar but insignificant result is obtained, perhaps because the number of firms in one group is too small, indeed, most of the groups in the sample contain only two firms.

[INSERT TABLE 13 HERE]

²² In the model where the group fixed effect is not controlled for, the industry fixed effect is controlled for.

6 Robustness Checks and Additional Tests

6.1 Changing the threshold value to 25%

In the preceding analysis, a 10% critical value is used to define control. The most widely used critical values are 10% and 20%, as shown in studies by La Porta, Lopez-De-Silanes et al., (1999) and Claessens, Djankov et al.(2000). As Osiris provides the ownership structure diagram at a 25% control value, this study uses 25% as an additional critical value to test whether the choice of threshold control value changes the main results. The sample size description using 25% as the control threshold value is presented in Table 14. Panel A shows that the number of firms (observations) with dispersed ownership increases from 40 (70) to 219 (587), and the number of firms (observations) controlled by widely held companies increases from 28 (87) to 54 (174). The sample size of family-controlled firms decreases from 950 (3,313) to 815 (2,821), and that of state controlled firms (observations) decreases slightly from 184 (715) to 172 (668). When the control critical value increases from 10% to 25%, the sample size of the family group decreases from 167 (619) to 129 (497) firms (observations).

[INSERT TABLE 14 HERE]

6.1.1 All firms

In Table 14, the Tobit model is applied to find the factors associated with wedge when the control critical value is at 25%. The results presented in Table 15 are similar to the results in Table 6. The two tables differ only in terms of analyst coverage and pledgeability of assets, both of which have no significant effect on the wedge.

Apparently, financial advantage is not the main consideration when a large shareholder decides to take a high fraction of ownership in a firm.

[INSERT TABLE 15 HERE]

The factors associated with wedge are included in the model used by Claessens, Djankov et al. (2002), and the results are shown in Table 16. The results of Claessens, Djankov et al.(2002) can still be replicated in column 1, the wedge has a negatively significant effect on firm value. After the significant factors associated with wedge are added to columns 2 and 3, the significant effect of the wedge disappears and almost all of the newly added variables are significantly related to firm value. All of the factors in the model are added to columns 4 and 5, and the results remain similar.

[INSERT TABLE 16 HERE]

6.1.2 Family-controlled firms

6.1.2.1 All family-controlled firms

The factors associated with wedge for 815 family-controlled firms are examined, and the results are presented in Table 17. The results are similar to those of Table 10, where the minimum control value is 10%. The transparency factors are positively related to the wedge, and the coefficients of age and size are significantly related. Capital expenditure, leverage, risk, collateral, and the director dummy are significantly negative associated with the wedge.

[INSERT TABLE 17 HERE]

The effect of the wedge on firm value before and after new variables added is examined, and the results are shown in Table 18. Before the factors associated with wedge are added, the wedge has a significantly negative effect on firm value, thereby indicating that the separation between control rights and cash-flow rights can be a

proxy for expropriation. However, after controlling for the firm characteristics related to the wedge, the wedge has no significant effect on firm value.

[INSERT TABLE 18 HERE]

6.1.2.2 Family group firms

The results of the factors associated with wedge for family group firms when the minimum control level is 25% are presented in Table 19. Similar to the results in Table 12, where the control threshold is 10%, younger group firms with a low risk and low pledgeability of cash flows and assets but high R&D expenses tend to have a high wedge. After controlling for the group fixed effect in columns 5 and 6, small firms also have a higher wedge than larger firms.

[INSERT TABLE 19 HERE]

Table 20 presents the results when the performance effect of the wedge is regressed for family-controlled group firms with a minimum control level of 25%. The results are similar to those of Table 13, it is worth noting that when the group fixed effect is controlled, the wedge has a positively significant effect on firm value. This result is consistent with previous evidence of the positive relationship between pyramid position and firm value, and moreover, when the control critical value increases, the pyramid position and wedge are more positively related to each other.

[INSERT TABLE 20 HERE]

6.2 Value effect of the residual from the wedge determination regression in the model used by Claessens, Djankov et al.(2002)

To further improve the influence of firm characteristics on the negative relationship between wedge and, the model of Claessens, Djankov et al.(2002) is used and the wedge in the model is replaced with the residual from wedge determination regression to check whether or not the part of the wedge that is unexplained by firm characteristics still has a significant effect on firm value.

[INSERT TABLE 21 HERE]

Table 21 presents the results with the residual taken from Table 6 for all of the firm-year observations at the 10% control level. No significant association exists between the residual and firm value, which proves that the negative relationship between the wedge and firm value in Claessens, Djankov et al.(2002) model is disturbed by firm characteristics.

[INSERT TABLE 22 HERE]

Table 22 shows the results for family-controlled firms at the 10% control level. The results also support the conclusion that any explanatory power of the wedge for firm value is attributed to the influence of these firm characteristics on firm value.

[INSERT TABLE 23 HERE]

[INSERT TABLE 24 HERE]

Tables 23 and 24 show the residual regression results for all of the firms and family-controlled firms at the 25% control level, respectively. The results are similar with previous evidence.

6.3 Factors associated with wedge for all firms using the logit model

The Tobit model is used to describe the relationship between a dependent variable with an lower or upper limit and independent variables. The dependent variable in the Tobit model should have a value below the lower limit or above the upper limit, but the value cannot be observed (Tobin, 1958). The dependent variable in Tables 4 and 5 is the wedge, which is calculated as the difference between control rights and cash-flow rights. The lower limit of 0 of the wedge is not due to its unobservable attribute, hence, this study reexamines the model of the factors associated with wedge using logit model, in which the dummy wedge serves as the dependent variable. The dummy wedge equals 1 when the wedge is greater than 0, and 0 otherwise.

[INSERT TABLE 25 HERE]

Table 25 shows the results of every characteristic category separately. The results in Table 25 are consistent with the results in table 5. Table 26 presents the results of all of the factors in one model, and they are consistent with the results in Table 6. Mature, large firms with a low degree of capital intensity, low leverage, low pledgeability of assets, and low staff costs are highly likely to be controlled with disproportionate ownership. The results of the factors associated with wedge are not influenced by the econometric method used.

[INSERT TABLE 26 HERE]

6.4 The effect of Chinese firms

Among Hong Kong listed firms, there are many China-controlled companies (red-chip companies).²³ As the legal and regulatory system of Hong Kong is different from that of China, and the legal protection of minority shareholders is critical for the choice of ownership structure ((Claessens and Fan, 2002; La Porta, Lopez-De-Silanes and Shleifer, 1999; La Porta, Lopez-de-Silanes, Shleifer and Vishny, 2000b; Masulis, Pham and Zein, 2011; Shleifer and Vishny, 1997), this section examines whether China-controlled firms significantly increase the negative effect of the wedge on firm value. Data of red-chip companies were collected from the HKEX website,²⁴ and 220 (807) China-controlled firms (observations) were obtained.

Table 27 shows whether Chinese firms influence the value effect of the wedge. A Chinese firm dummy and its interaction with the model used by Claessens, Djankov et al.(2002) are included in specification 1. The wedge has a negative effect on firm value at a marginally significant level, and China-controlled firms increase this negative effect but not significantly. When significant factors are added to columns 2 and 3 and all of the factors are added to columns 4 and 5, the wedge has no significant effect on firm value. China-controlled firms exhibit higher value than others, and Chinese firms increase the negative effect of the wedge on firm value, but not at any significant level.

²³ The HKEX defines red-chip companies as follows: “A company is deemed to be China-controlled company (Red Chip), if (1) the company has at least 30% shareholding held in aggregate directly by Mainland China entities, and/or through companies which are controlled by Mainland China entities. Or (2) the company has below 30% but 20% or above shareholding held in aggregate directly by Mainland China entities, and/or through companies which are controlled by Mainland China entities and, there is a strong influential presence, on a judgmental basis, on the company's board of directors.”

²⁴ <http://www.hkex.com.hk/eng/csm/result.asp?location=companySearch&SearchMethod=2&mkt=hk&LangCode=en&Ranking=ByName&StockType=REDCHIPS&x=24&y=11>

[INSERT TABLE 27 HERE]

6.5 Effect of firms listed on the GEM board

The sample includes firms listed on the Main Board and firms listed on the Growth Enterprise Market (GEM). On the one hand, the Main Board and GEM have different disclosure requirements, and on the other hand, firms listed on the GEM are mainly high-growth firms. Hence, this study examines whether the results are influenced when GEM firms are included. The results are presented in Table 28, and the main result does not change regardless of whether GEM firms are included.

[INSERT TABLE 28 HERE]

6.6 Value effect of state-owned firms

Along with family controlled firms, state owned firms occupy the highest percentage in the sample. Local government and central government owned firms are not distinguishable, and a simple examination is conducted to determine whether the value discount of the wedge can be applied to state-owned firms, and whether the factors discussed in this study change the result. Table 29 shows that the wedge has a negative but insignificant effect on firm value when the new factors are not considered. After including the new variables, the wedge still has no significant effect on firm value.

[INSERT TABLE 29 HERE]

6.7 Dividend payout ratio as the proxy for expropriation

La Porta, Lopez-de-Silanes, Shleifer and Vishny (2000a) prove that in countries with strong minority shareholder protection, minority shareholders would pressure

corporate insiders to pay more dividend. Dividend payout ratio can be used as a proxy for the expropriation is because that high level of dividend payout ratio indicates that lower amount of asset in the corporate may be tunneled to the largest shareholder. Thus, the positive relationship between dividend payout ratio and firm value should be expected. As shown in table 30, the wedge is replaced by dividend payout ratio in Claessens et al. (2002) model, the result shows that no significant relationship can be found between dividend payout ratio and firm value.

[INSERT TABLE 30 HERE]

6.8 Using Log(Tobin's Q) as the dependent variable

Table 31 presents the results of the value effect of wedge when adding more firm characteristics, and using Log(Tobin's Q) as the dependent variable to test the robustness of the results. The results shows that the main result still hold when using log(Tobin's Q) as the dependent variable, in column 1, wedge has negative significant effect on firm value at 10% level, and when adding firm characteristics in the other columns, the negative significance relationship is disappeared.

[INSERT TABLE 31 HERE]

6.9 adding firm characteristics one by one in value effect model

To test which firm characteristics causes the significant effect of wedge on firm value is disappeared, firm characteristics that significant related with wedge is added in to the value effect model one by one in Table 32. Column 6 of Table 32 shows that when all the significant factors associated with wedge are added in to the model, the wedge has no significant on the firm value, but when some of these factors added into

the model, wedge still has negative effect but at 10% significant level, as shown from column 2 to column 5.

[INSERT TABLE 32 HERE]

7 Conclusion

This study addresses the separation between control rights and cash-flow rights in the pyramid structure. Previous evidence indicates that disproportionate ownership is associated with lower firm value, thereby implying that the largest shareholders expropriate minority shareholders through this ownership structure. However, ownership is not exogenous, and large shareholders may choose a specific ownership structure based on firm characteristics. The result highlight the endogeneity problem that arises when these firm characteristics are not considering.

This study uses panel data on Hong Kong public firms over five-year period to identify the factors associated with the separation of control rights and cash-flow rights. It classifies the factors into five categories: transparency, the firm's growth and capital requirement, the pledgeability of cash flows and assets, risk, and technology factors. It finds that high-wedge firms are associated with high transparency to eliminate market concerns on expropriation, and that high wedge firms tend to have a lower leverage, as leverage and the pyramid are substitute mechanisms for controlling a firm. This study also observes that the tangibility and collateral of firms are lower for high-wedge firms, thereby indicating the financial advantage of the pyramid group, and that large shareholders choose to control these firms directly due to the low pledgeability of assets of these firms. As for the risk choice, a higher wedge is associated with lower systematic and unsystematic risk. When all of the significant factors associated with wedge are considered, the value discount of the wedge cannot be observed. Furthermore, most of the newly added

factors are related to both the wedge and firm value, thereby indicating that previous studies are subject to an endogeneity problem due to omitted variables.

Almeida, Park et al.(2011) and Masulis, Pham et al.(2011) find a positive relationship between position and firm value for family-controlled groups. Based on a subsample of family-controlled firms in Hong Kong, this study finds that the factors associated with wedge for group firms differ from those of the wedge for all firms. In a group, younger firms with higher growth, lower leverage, higher staff costs, and higher R&D expenses tend to have a higher wedge. Controlling for the group fixed effect, this study finds that the wedge has a positive effect on firm value, consistent with the findings of Almeida, Park et al. (2011) and Masulis, Pham et al. (2011).

This study has three limitations. Firstly, Hong Kong is considered as a well-developed economic entity in studies. The agency problem between large and minority shareholders is more severe in developing countries than in developed area, therefore, whether the factors considered in this study can be applied to other areas is uncertain. Second, due to time limitations, this study collected ownership data for only five years. As ownership changes slowly, a longer time interval is needed to determine whether a change in ownership structure changes a firm's value. Third, three main mechanisms can be used to make control rights and cash-flow rights unequal. As this study examines only the pyramid structure, firm characteristics related to the choice of multiple voting rights and the cross-shareholding structure require further testing.

Appendix: Definition of variables

Variable	Definition	Source
<i>Ownership variable</i>		Annual report and Osiris
Ownership	The Cash-flow rights of the ultimate largest shareholder, in percentage of total outstanding shares	
Control Right	The Voting rights of the ultimate largest shareholder, in percentage of total outstanding shares	
Wedge	Control Right minus Cash-flow right	
Group	a dummy variable which equals to 1 when the owner controls at least another one firm in the sample, and 0 otherwise	
<i>Performance</i>		Datastream and Bloomberg
Tobin's Q	Tobin's Q is calculated as the market value of common stock and book value of debt and book value of preferred stock divided by the book value of total asset	
<i>Firm characteristics</i>		Datastream ,Bloomberg and CSMAR
age	number of years since the firm incorporation	
Size	Log of total asset	
AnalystCoverage	Logarithm of 1 plus the number of analysts covering a firm	
Dividend	Dividend paid divided by EBIT	
Capitalexpenditure	Calculated as the ratio of capital spending to total sales	
Sales Growth	Calculated as the average annual sales growth rate in previous three years	
Leverage	The sum of long-term debt and debt in current liabilities divided by total asset	
Beta	Regress a firm's weekly stock return over two years using market model	
idiosyncratic risk	standard error of the market model using for calculating Beta	
Profitability	Ratio of EBIT to total asset	
Tangibility	Ratio of net PP&E to total asset	
Collateral	Ratio of the sum of tangible assets and inventories to total assets	
Capital-labor Ratio	Ratio of fixed assets to employment	
Wage	Ratio of wages to employment	

R&D	Ratio of R&D to total asset	
Director	a dummy which is equals to 1 when family members are involved in management and 0 otherwise	

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Table 1
Sample Description and Summary Statistics

Panel A and B present sample size description of total sample and subsample for Hong Kong firms between 2009 and 2013, panel C presents the summary statistics of the ownership and financial variables. The ownership data are from annual report and OSIRIS, the financial data are from DataStream and Bloomberg. The definition of variables in detail is in section 3.3. ownership measure the largest shareholder's cash-flow right, control-right is a measure of the minimum cash-flow right along the ownership chain between the largest shareholder and the firm, wedge is a measure of the difference of the control-right and cash-flow right, CapitalExpenditure, SalesGrowth, Profitability, Tangibility and Collateral are value from previous period.

Panel A Total sample						
	Dispersed ownership	Widely held company	Family	State	Total	
No. of firms	40	28	950	184	1202	
No. of observations	70	87	3313	715	4185	
No. of observations with wedge	-	10	1015	213	1238	

Panel B Family controlled firms		
	Group firm	Non group firm
No. of firms	167	801
No. of observations	619	2694
No. of observations with wedge	308	707

Panel C Summary statistics of whole sample						
Variable	Mean	Std	Min	Median	Max	Obs
Ownership	42.552	19.744	0.380	42.510	91.060	4185
Control-right	46.809	18.157	3.490	48.500	91.060	4185
Wedge (C-O)	4.258	8.033	0.000	0.000	39.970	4185
age	13.613	10.844	0.000	12.000	103.000	4185
Assets(millions HKD)	22319.305	70205.482	54.300	2824.398	540312.000	4185
AnalystCoverage	0.484	2.155	0.000	0.000	14.833	4185
DividendPayout	26.110	42.416	0.000	15.021	295.119	4185
CapitalExpenditure	0.045	0.049	0.000	0.028	0.230	4185
SalesGrowth	0.283	0.981	-0.879	0.109	7.100	4185
Leverage	0.197	0.190	0.000	0.153	0.983	4185
beta	0.744	0.479	-0.356	0.707	1.978	4185
IdiosyncraticRisk	6.772	3.227	1.561	6.132	19.855	4185
Profitability	0.043	0.114	-0.449	0.041	0.362	4185
Tangibility	0.280	0.224	0.001	0.232	0.933	4185
Collateral	0.410	0.252	0.001	0.415	0.977	4185
Capital/labor(millions HKD)	1.662	4.858	0.004	0.312	36.963	4185

Wage/employees(millions HKD)	0.118	0.123	0.006	0.075	0.784	4185
R&D	0.005	0.012	0.000	0.000	0.073	4185
Tobin's Q	1.204	1.372	0.078	0.773	9.603	4185

Panel D Mean value for each firm type

Variable	Dispersed ownership	Widely held company	Family	State
Ownership	7.976	46.164	42.474	45.856
Control-right	7.976	47.449	46.751	50.805
Wedge (C-O)	0.000	1.286	4.276	4.948
Age	14.329	10.506	13.388	14.962
Assets(millions HKD)	2381.389	49361.605	12656.809	65752.624
AnalystCoverage	0.060	1.345	0.412	0.756
DividendPayout	5.330	34.398	26.995	23.036
CapitalExpenditure	0.028	0.060	0.043	0.051
SalesGrowth	0.646	0.231	0.282	0.257
Leverage	0.227	0.196	0.187	0.239
beta	0.685	0.836	0.700	0.942
IdiosyncraticRisk	10.291	5.962	6.980	5.565
Profitability	-0.077	0.048	0.045	0.044
Tangibility	0.157	0.265	0.272	0.331
Collateral	0.206	0.354	0.405	0.458
Capital/labor(millions HKD)	0.405	0.699	1.671	1.859
Wage/employees(millions HKD)	0.144	0.104	0.118	0.118
R&D	0.001	0.008	0.004	0.005
Tobin's Q	1.177	1.467	1.235	1.034
Obs	70	87	3313	715

Table 2
Time series description for ownership variables

Panel A presents mean value of ownership variables from 2009 to 2013, panel B presents the number of observations that the large shareholders changed from t-1, panel C presents summary statistics for standard deviation of wedge for time series data for each firm. The ownership data are from annual report and OSIRIS, the financial data are from DataStream and Bloomberg. The definition of variables in detail is in section 3.3. ownership measure the largest shareholder's cash-flow right, control-right is a measure of the minimum cash-flow right along the ownership chain between the largest shareholder and the firm, wedge is a measure of the difference of the control-right and cash-flow right. ***indicates significance at 1% level.

Panel A Mean value for yearly ownership variables					
	2009	2010	2011	2012	2013
Ownership	42.732	42.679	42.371	42.605	42.448
Control-right	46.963	46.841	46.674	46.803	46.804
Wedge	4.231	4.162	4.303	4.199	4.356
Obs	645	722	817	948	1053

Panel B Number of observations that large shareholders changed				
	Dispersed ownership (t-1)	Widely held company (t-1)	Family (t-1)	State (t-1)
Dispersed ownership (t)	-	1	18	0
Widely held company (t)	0	-	0	2
Family (t)	21	4	-	5
State (t)	1	0	12	-

Panel C Summary statistics for time series variation of wedge					
Variable	Mean	Median	Std Dev	Minimum	Maximum
Std Dev of wedge for time series data for each firm	0.795***	0	2.224	0	16.3

Table 3
Pearson Correlation

This table presents Pearson correlation matrix for wedge and all financial variables. C-O is the wedge which is calculated by the difference between control right and cash flow right. Variables include age, size, analyst coverage and dividend are used to proxy for transparency, variables of capital expenditure, sales growth and leverage are proxy for the firm's growth and capital requirement, variables include beta, idiosyncratic risk are used to proxy for risk, variables of profitability, tangibility and collateral are proxy for pledgeability of cash flows and assets, variables contain capital/labor, wage/employee, and R&D are proxy for technology. CapitalExpenditure, SalesGrowth, Profitability, Tangibility and Collateral are value from previous period.

Variable	C-O	age	Size	Analyst coverage	Dividend	Capital expenditure	Sales Growth	Leverage	beta	Idiosyncratic Risk	Profitability	Tangibility	Collateral	Capital/labor	Wage/employee	R&D
C-O	1.00															
age	0.08	1.00														
Size	0.06	0.05	1.00													
Analyst coverage	0.06	0.15	0.22	1.00												
Dividend	0.04	0.01	0.09	0.04	1.00											
Capital expenditure	-0.04	0.21	0.14	-0.01	0.02	1.00										
Sales Growth	0.00	0.03	0.03	0.01	-0.06	0.02	1.00									
Leverage	-0.08	0.04	0.14	0.02	-0.17	0.06	0.02	1.00								
beta	-0.02	0.07	0.40	0.10	-0.05	0.08	0.01	0.07	1.00							
Idiosyncratic Risk	-0.07	0.10	0.43	-0.10	-0.22	-0.08	0.01	0.00	0.05	1.00						
Profitability	0.01	0.21	0.23	0.09	0.23	0.20	0.08	-0.12	0.07	-0.30	1.00					
Tangibility	-0.05	0.03	0.17	0.03	-0.02	0.37	-0.03	0.27	0.04	-0.13	0.03	1.00				
Collateral	-0.05	0.02	0.24	0.04	-0.01	0.23	-0.02	0.32	0.10	-0.17	0.08	0.81	1.00			
Capital/labor	0.00	0.13	0.21	0.02	-0.04	-0.02	0.06	0.07	0.02	-0.09	-0.02	0.35	0.29	1.00		
Wage/employees	0.02	0.13	0.05	0.05	-0.03	-0.10	0.05	0.00	-0.06	0.03	-0.09	0.00	-0.05	0.38	1.00	
R&D	-0.02	0.09	0.09	0.02	-0.02	0.05	-0.02	-0.08	-0.01	0.00	0.05	-0.08	-0.09	-0.10	-0.04	1.00

Table 4
Adding fix-firm effect in Claessens, Djankov et al.(2002) model

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership. Size, age, sales growth and capital expenditure/sales are control variables, size is the logarithm of book value of assets, age is the number of years since the firm incorporation, sales growth and capital expenditure/sales are from previous period. Numbers in parentheses are robust standard errors clustered at firm level. ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2
Intercept	6.409*** (9.03)	21.87*** -3.85
Ownership	0.001 (0.58)	0.00912 -1.71
Wedge	-0.008** (-2.17)	-0.00106 (-0.12)
Size	-0.222*** (-6.56)	-0.713*** (-5.81)
Age	-0.01*** (-3.35)	-0.475 (-1.10)
SalesGrowth(t-1)	0.06** (2.31)	0.0387 -1.91
CapitalExpenditure/Sales(t-1)	0.166 (0.71)	-0.0802 (-0.97)
Firm fixed effect	No	Yes
Adjusted R-square	0.135	0.7618
Number of Clusters	1152	1152
Number of Observations	4185	4185

Table 5
Factors associated with wedge for all firms-Part of factors

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is the wedge, calculated as difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. I use Tobit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

	Parameter	1	2	3	4	5	6	7
	Intercept	24.963 ***	5.058* **	7.329* **	4.355 **	4.818* **	4.858* **	9.346
		(-4.64)	(-3.18)	(-4.57)	(-2.48)	(-2.91)	(-2.93)	(1.6)
	age	0.124* **						
		(3.52)						
	SIZE	0.66** *						
		(2.77)						
Transparency	Analyst coverage	0.283 (1.61)						
	Dividend	0.014 (1.59)						
	Capital expenditure(t-1)		-26.373*** (-3)					
Firm's growth and capital requirement	Sales Growth(t-1)		0.052 (0.13)					
	Leverage		-10.939*** (-4.9)					
	beta			-1.081 (-1.25)				
Risk	Idiosyncratic Risk				0.53* **			
					(-3.93)			

	Profitability(t-1)					4.476	5.128
						(1.24)	(1.42)
Pledgeability of cash flows and assets	Tangibility(t-1)					-	
						9.183*	
						**	
						(-4.84)	
	Collateral(t-1)					-	
						8.002*	
						**	
							(-4.74)
Technology	Capital/labor						-
							0.423
							(-
							1.58)
							-
							0.981
	Wage/employees					*	
						(-	
						1.95)	
	R&D					-	
						4.005	
						(-	
						0.12)	
	Number of Observations	4185	4185	4185	4185	4185	4185
	Log Likelihood	-6907	-6905	-6922	-6915	-6911	-6911
							-
							6918

Table 6
Factors associated with wedge for all firms -All factors

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is the wedge, calculated as difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. I use Tobit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

	Parameter	1	2	3	4
	Intercept	-10.661	0.352	-11.663	-0.725
Transparency		(-1.28)	(0.04)	(-1.41)	(-0.08)
	age	0.113***	0.109***	0.114***	0.11***
		(3.06)	(2.93)	(3.09)	(2.95)
	SIZE	1.035***	0.587**	1.085***	0.642**
		(3.67)	(2.09)	(3.88)	(2.31)
	Analyst coverage	0.347*	0.335*	0.334*	0.323*
		(1.96)	(1.89)	(1.88)	(1.82)
	Dividend	0.004	0.002	0.003	0.001
		(0.39)	(0.22)	(0.31)	(0.13)
Firm's growth and capital requirement	Capital expenditure(t-1)	-18.935*	-19.461**	-22.609**	-22.845**
		(-1.94)	(-1.99)	(-2.4)	(-2.42)
	Sales Growth(t-1)	0.032	0.089	0.055	0.107
		(0.08)	(0.22)	(0.14)	(0.26)
	Leverage	-8.869***	-8.631***	-8.501***	-8.166***
		(-3.73)	(-3.62)	(-3.53)	(-3.39)
Risk	beta	-2.404**		-2.271**	
		(-2.55)		(-2.42)	
	Idiosyncratic Risk		-0.342**		-0.349**
			(-2.21)		(-2.26)
Pledgeability of cash flows and assets	Profitability(t-1)	2.163	0.801	2.913	1.547
		(0.55)	(0.2)	(0.73)	(0.38)
	Tangibility(t-1)	-6.644***	-6.729***		
		(-2.73)	(-2.76)		
	Collateral(t-1)			-5.23***	-5.646***

				(-2.63)	(-2.82)
	Capital/labor	0.048	0.017	-0.099	-0.11
		(0.14)	(0.05)	(-0.31)	(-0.34)
Technology	Wage/employees	-1.414***	-1.395***	-1.277**	-1.265**
		(-2.65)	(-2.61)	(-2.43)	(-2.4)
	R&D	5.928	-0.049	4.469	-1.246
		(0.17)	(0)	(0.13)	(-0.04)
	Number of Observations	4185	4185	4185	4185
	Log Likelihood	-6876	-6877	-6877	-6877

Table 7
Value effect of all firms when adding new variables

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Numbers in parentheses are robust standard errors clustered at firm level. I add year and industry dummy to the model, industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5	6
Intercept	6.409*** (9.03)	4.775*** (5.62)	3.662*** (4.12)	4.752*** (5.56)	3.666*** (4.08)	4.486*** (5.92)
Ownership	0.001 (0.58)	0.002 (0.84)	0.002 (0.93)	0.002 (0.97)	0.002 (1.02)	0.002 (0.93)
Wedge	-0.008** (-2.17)	-0.006 (-1.56)	-0.005 (-1.43)	-0.006 (-1.53)	-0.005 (-1.41)	-0.006 (-1.58)
Size	-0.222*** (-6.56)	-0.273*** (-7.45)	-0.228*** (-6.62)	-0.272*** (-7.37)	-0.229*** (-6.5)	-0.234*** (-7.44)
Age	-0.01*** (-3.35)	-0.011*** (-4.14)	-0.01*** (-3.99)	-0.01*** (-4.08)	-0.01*** (-3.97)	-0.009*** (-3.07)
Sales Growth(t-1)	0.06** (2.31)	0.05** (1.97)	0.046* (1.82)	0.049* (1.92)	0.045* (1.78)	0.071** (2.54)
CapitalExpense/Sales(t-1)	0.166 (0.71)					
Analyst coverage		0.077*** (6.14)	0.078*** (6.12)	0.077*** (6.12)	0.078*** (6.11)	0.072*** (5.47)
Capital expenditure(t-1)		2.027*** (2.84)	2.105*** (2.93)	2.21*** (3.43)	2.274*** (3.51)	2.224*** (3.32)
Leverage		0.918*** (3.08)	0.873*** (2.78)	0.963*** (3.12)	0.91*** (2.79)	1.109*** (3.38)
beta		0.195*** (2.72)		0.194*** (2.72)		0.196*** (2.92)
Idiosyncratic Risk			0.034**		0.033**	

			(2.05)		(1.99)	
Tangibility(t-1)	0.046		0.07			
	(0.18)		(0.27)			
Collateral(t-1)				-0.096	-0.053	0.249
				(-0.48)	(-0.27)	(1.19)
Wage/employees	0.196***	0.198***	0.199***	0.2***	0.289***	
	(4.49)	(4.52)	(4.54)	(4.56)	(6.34)	
Dividend						0.001
						(1.19)
Profitability(t-1)						-0.224
						(-0.3)
Capital/labor						-0.14***
						(-5.29)
R&D						12.276***
						(2.59)
Adjusted R-square	0.135	0.19	0.191	0.191	0.191	0.219
Number of Clusters	1152	1152	1152	1152	1152	1152
Number of Observations	4185	4185	4185	4185	4185	4185

Table 8
Factors associated with wedge with when adding family dummy

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is the wedge, calculated as difference between control right and ownership, family is a dummy variable which equals to 1 when the ultimate owner is a individual and equals to 0 otherwise, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. I use Tobit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4
Intercept	52.6*** (2.97)	68.654*** (3.53)	56.378*** (3.18)	70.978*** (3.65)
age	0.252*** (2.79)	0.23** (2.52)	0.26*** (2.87)	0.24*** (2.64)
SIZE	-1.817*** (-3.05)	-2.281*** (-3.85)	-1.763*** (-2.97)	-2.157*** (-3.69)
Analyst coverage	0.41 (1.27)	0.43 (1.33)	0.468 (1.46)	0.491 (1.53)
Dividend	-0.024 (-0.82)	-0.029 (-0.96)	-0.023 (-0.79)	-0.028 (-0.92)
Capital expenditure(t-1)	15.868 (0.74)	13.65 (0.64)	0.593 (0.03)	-2.035 (-0.1)
Sales Growth(t-1)	-0.822 (-0.8)	-0.652 (-0.64)	-0.814 (-0.77)	-0.659 (-0.62)
Leverage	-3.883 (-0.8)	-3.671 (-0.75)	-7.758 (-1.55)	-7.647 (-1.53)
beta	-0.885 (-0.4)		-0.516 (-0.23)	
Idiosyncratic Risk		-0.697 (-1.64)		-0.656 (-1.55)
Profitability(t-1)	21.508* (1.84)	18.415 (1.54)	21.882* (1.89)	18.897 (1.6)
Tangibility(t-1)	-11.256** (-2.26)	-11.771** (-2.35)		
Collateral(t-1)			4.494 (1.04)	4.424 (1.02)

Capital/labor	1.089 (1.37)	0.986 (1.25)	-0.13 (-0.17)	-0.249 (-0.32)
Wage/employees	-2.955** (-2.45)	-2.932** (-2.44)	-2.396** (-1.97)	-2.377** (-1.96)
R&D	-51.048 (-0.68)	-65.216 (-0.86)	-51.943 (-0.69)	-64.689 (-0.85)
Family	-92.971*** (-4.74)	-100.376*** (-4.65)	-96.42*** (-4.92)	-101.809*** (-4.72)
age*Family	-0.197** (-1.99)	-0.173* (-1.73)	-0.198** (-1.99)	-0.177* (-1.77)
SIZE*Family	4.169*** (6.1)	4.232*** (6.22)	4.078*** (6.02)	4.055*** (6.05)
Analyst coverage*Family	-0.192 (-0.49)	-0.228 (-0.59)	-0.25 (-0.65)	-0.286 (-0.74)
Dividend*Family	0.027 (0.89)	0.032 (1.01)	0.027 (0.87)	0.031 (0.98)
Capital expenditure(t-1)*Family	-43.178* (-1.82)	-41.335* (-1.74)	-25.53 (-1.13)	-22.76 (-1.01)
Sales Growth(t-1)*Family	1.022 (0.92)	0.873 (0.79)	0.982 (0.86)	0.843 (0.74)
Leverage*Family	-6.428 (-1.16)	-6.277 (-1.13)	-1.215 (-0.21)	-0.813 (-0.14)
beta*Family	-1.646 (-0.68)		-1.913 (-0.79)	
Idiosyncratic Risk*Family		0.441 (0.99)		0.372 (0.84)
Profitability(t-1)*Family	-23.26* (-1.87)	-21.16* (-1.67)	-22.619* (-1.84)	-20.719* (-1.65)
Tangibility(t-1)*Family	7.92 (1.39)	8.444 (1.49)		
Collateral(t-1)*Family			-10.939** (-2.29)	-11.363** (-2.37)
Capital/labor*Family	-1.706* (-1.96)	-1.627* (-1.88)	-0.311 (-0.36)	-0.187 (-0.22)
Wage/employees*Family	2.448* (1.85)	2.468* (1.88)	1.804 (1.36)	1.812 (1.37)
R&D*Family	67.518 (0.81)	77.293 (0.92)	68.009 (0.82)	76.404 (0.91)
Number of Observations	4185	4185	4185	4185
Log Likelihood	-6849	-6850	-6847	-6847

Table 9
Determination of wedge for firms controlled by family

The regressions are performed using panel data of 950 family controlled firms in Hong Kong from 2009 to 2013. Family controlled firms are defined as firms whose ultimate owner is an individual. The dependent variable is the wedge, calculated as difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Director is a dummy which is equals to 1 when family members are involved in management and 0 otherwise. I use Tobit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4
Intercept	-35.043*** (-3.67)	-24.691** (-2.46)	-34.989*** (-3.68)	-24.223** (-2.43)
age	0.047 (1.2)	0.044 (1.12)	0.051 (1.31)	0.048 (1.23)
SIZE	2.499*** (7.4)	2.093*** (6.2)	2.465*** (7.4)	2.043*** (6.17)
Analyst coverage	0.165 (0.8)	0.154 (0.75)	0.164 (0.79)	0.155 (0.75)
Dividend	0.007 (0.75)	0.006 (0.6)	0.008 (0.79)	0.006 (0.62)
Capital expenditure(t-1)	-33.772*** (-3.22)	-34.232*** (-3.27)	-32.201*** (-3.19)	-32.254*** (-3.2)
Sales Growth(t-1)	0.169 (0.4)	0.195 (0.46)	0.147 (0.35)	0.17 (0.41)
Leverage	-9.74*** (-3.76)	-9.375*** (-3.62)	-8.924*** (-3.4)	-8.429*** (-3.21)
beta	-2.188** (-2.2)		-2.149** (-2.17)	
Idiosyncratic Risk		-0.332** (-2.11)		-0.351** (-2.23)
Profitability(t-1)	0.349 (0.08)	-1.009 (-0.24)	0.831 (0.2)	-0.566 (-0.14)
Tangibility(t-1)	-1.58 (-0.59)	-1.596 (-0.6)		
Collateral(t-1)			-3.594*	-4.02*

			(-1.67)	(-1.86)
Capital/labor	-0.686*	-0.71*	-0.574*	-0.574*
	(-1.84)	(-1.91)	(-1.68)	(-1.68)
Wage/employees	-0.613	-0.602	-0.642	-0.643
	(-1.07)	(-1.05)	(-1.14)	(-1.15)
R&D	32.901	28.397	33.257	28.865
	(0.9)	(0.78)	(0.91)	(0.79)
Director	-7.161***	-7.471***	-6.991***	-7.289***
	(-6.09)	(-6.32)	(-5.94)	(-6.16)
Number of Observations	3313	3313	3313	3313
Log Likelihood	-5538	-5538	-5537	-5536

Table 10
value effect when adding new variables for family controlled firms

The regressions are performed using panel data of 950 family controlled firms in Hong Kong from 2009 to 2013. Family controlled firms are defined as firms whose ultimate owner is an individual. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense scaled by total assets. Director is a dummy which is equals to 1 when family members are involved in management and 0 otherwise. Numbers in parentheses are robust standard errors clustered at firm level. I add year and industry dummy to the model, industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5
Intercept	7.825*** (8.9)	8.581*** (9.24)	7.448*** (7.71)	6.268*** (6.9)	5.087*** (4.8)
Ownership	-0.001 (-0.27)	0 (-0.2)	0 (-0.19)	0 (0.2)	0 (0.18)
Wedge	-0.008* (-1.79)	-0.007 (-1.6)	-0.006 (-1.47)	-0.007 (-1.54)	-0.006 (-1.4)
Size	-0.285*** (-6.94)	-0.295*** (-6.69)	-0.251*** (-5.67)	-0.294*** (-7.22)	-0.253*** (-5.92)
Age	-0.01*** (-2.98)	-0.006* (-1.96)	-0.006* (-1.89)	-0.01*** (-3.05)	-0.01*** (-2.82)
Sales Growth(t-1)	0.071** (2.34)	0.081*** (2.66)	0.079*** (2.65)	0.077** (2.43)	0.075** (2.36)
CapitalExpense/Sales(t-1)	0.287 (1.03)				
Capital expenditure(t-1)		1.783** (2.51)	1.824** (2.56)	1.99** (2.57)	1.974*** (2.59)
Leverage		0.856** (2.51)	0.79** (2.19)	0.913** (2.45)	0.869** (2.27)
beta		0.174** (2.38)		0.155** (2.2)	
Idiosyncratic Risk			0.038** (2.01)		0.043** (2.57)

Collateral(t-1)		0.024	0.074	0.119	0.166
		(0.09)	(0.29)	(0.47)	(0.66)
Capital/labor		-0.07**	-0.072***	-0.124***	-0.124***
		(-2.54)	(-2.6)	(-4.11)	(-4.13)
Director		0	0.042	0	0.039
		(0)	(0.33)	(0)	(0.32)
Analyst coverage				0.109***	0.109***
				(6.13)	(6.04)
Dividend				0.001	0.001
				(0.98)	(1.63)
Profitability(t-1)				-0.178	0.002
				(-0.22)	(0)
Wage/employees				0.244***	0.246***
				(4.67)	(4.72)
R&D				11.183**	11.564**
				(2.22)	(2.35)
Adjusted R-square	0.164	0.18	0.183	0.231	0.235
Number of Clusters	950	950	950	950	950
Number of Observations	3313	3313	3313	3313	3313

Table 11
Factors associated with wedge for family firms when adding group dummy

The regressions are performed using panel data of 950 family controlled firms in Hong Kong from 2009 to 2013. Family controlled firms are defined as firms whose ultimate owner is an individual. The dependent variable is the wedge, calculated as difference between control right and ownership, group is a dummy variable which equals to 1 when the owner controls at least another one firm in the sample, when the ultimate owner is a individual and equals to 0 otherwise, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Director is a dummy which is equals to 1 when family members are involved in management and 0 otherwise. I use Tobit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4
Intercept	13.5 (1.24)	13.357 (1.19)	11.139 (1.03)	10.68 (0.96)
age	0.102** (2)	0.103** (2.04)	0.093* (1.83)	0.094* (1.86)
SIZE	0.885** (2.31)	0.86** (2.28)	1.019*** (2.73)	1.007*** (2.75)
Analyst coverage	0.218 (0.73)	0.21 (0.71)	0.203 (0.68)	0.196 (0.67)
Dividend	-0.007 (.)	-0.007 (.)	-0.008 (.)	-0.008 (.)
Capital expenditure(t-1)	-27.046** (-2.44)	-27.029** (-2.45)	-32.616*** (-3.08)	-32.467*** (-3.08)
Sales Growth(t-1)	0.278 (0.59)	0.29 (0.61)	0.331 (0.7)	0.34 (0.72)
Leverage	-10.023*** (-3.56)	-9.943*** (-3.54)	-10.336*** (-3.61)	-10.267*** (-3.6)
beta	-0.377 (-0.35)		-0.237 (-0.22)	
Idiosyncratic Risk		0.009 (0.05)		0.011 (0.06)
Profitability(t-1)	9.446** (2.14)	9.724** (2.18)	9.373** (2.12)	9.625** (2.16)

Tangibility(t-1)	-5.96**	-5.94**		
	(-1.98)	(-1.98)		
Collateral(t-1)			-2.188	-2.216
			(-0.92)	(-0.93)
Capital/labor	-0.18	-0.173	-0.471	-0.462
	(-0.44)	(-0.42)	(-1.23)	(-1.21)
Wage/employees	-2.916***	-2.89***	-2.68***	-2.648***
	(-4.57)	(-4.55)	(-4.3)	(-4.26)
R&D	7.615	7.109	5.162	4.807
	(0.2)	(0.19)	(0.14)	(0.13)
Director	-3.154**	-3.145**	-3.288**	-3.278**
	(-2.23)	(-2.22)	(-2.31)	(-2.3)
Group	-84.007***	-48.676**	-81.394***	-46.488**
	(-4.18)	(-2.21)	(-4.06)	(-2.11)
age*Group	-0.231***	-0.266***	-0.217***	-0.251***
	(-2.91)	(-3.34)	(-2.75)	(-3.17)
SIZE*Group	2.826***	1.618**	2.619***	1.454**
	(3.87)	(2.19)	(3.63)	(1.99)
Analyst coverage*Group	-0.205	-0.203	-0.208	-0.21
	(-0.5)	(-0.5)	(-0.51)	(-0.52)
Dividend*Group	0.032	0.025	0.034	0.027
	(1.49)	(1.16)	(1.61)	(1.25)
Capital expenditure(t-1)*Group	7.456	9.072	21.727	22.539
	(0.28)	(0.34)	(0.85)	(0.88)
Sales Growth(t-1)*Group	-0.603	-0.551	-0.747	-0.674
	(-0.65)	(-0.6)	(-0.81)	(-0.74)
Leverage*Group	6.364	6.613	8.02	8.344
	(0.99)	(1.03)	(1.23)	(1.29)
beta*Group	-4.354*		-4.097*	
	(-1.86)		(-1.74)	
Idiosyncratic Risk*Group		-1.085***		-1.076***
		(-3.26)		(-3.24)
Profitability(t-1)*Group	-21.729**	-31.651***	-20.752*	-30.376***
	(-2.02)	(-2.87)	(-1.93)	(-2.75)
Tangibility(t-1)*Group	6.701	5.38		
	(1.09)	(0.88)		
Collateral(t-1)*Group			-3.355	-4.372
			(-0.67)	(-0.89)
Capital/labor*Group	-1.236	-1.14	-0.406	-0.339
	(-1.49)	(-1.38)	(-0.53)	(-0.45)
Wage/employees*Group	4.876***	4.538***	4.257***	3.918***
	(3.71)	(3.45)	(3.28)	(3.02)
R&D*Group	254.261**	236.34**	262.733**	246.106**

	(2.17)	(2.02)	(2.24)	(2.1)
Director*Group	-5.469**	-5.941**	-5.402**	-5.871**
	(-2.2)	(-2.39)	(-2.17)	(-2.36)
Number of Observations	3313	3313	3313	3313
Log Likelihood	-5456	-5452	-5457	-5452

Table 12
Determination of wedge for family group firms

The regressions are performed using panel data of 169 family group firms in Hong Kong from 2009 to 2013. Family group firms are defined as firms whose largest owner control at least another one firm in the sample. The dependent variable is the wedge, calculated as difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Director is a dummy which is equals to 1 when family members are involved in management and 0 otherwise. I use Tobit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5	6
Intercept	-57.192*** (-3.17)	-20.487 (-1.05)	-55.777*** (-3.11)	-19.833 (-1.03)	27.541 (1.33)	48.88** (2.24)
age	-0.166*** (-2.8)	-0.199*** (-3.35)	-0.162*** (-2.74)	-0.193*** (-3.27)	-0.246*** (-4.75)	-0.253*** (-4.9)
SIZE	3.257*** (5.24)	1.955*** (3.08)	3.175*** (5.17)	1.924*** (3.07)	-0.864 (-1.29)	-1.812*** (-2.62)
Analyst coverage	0.234 (0.85)	0.22 (0.81)	0.221 (0.8)	0.202 (0.75)	0.241 (1.13)	0.104 (0.51)
Dividend	0.03* (1.71)	0.022 (1.25)	0.032* (1.81)	0.023 (1.3)	0.008 (0.6)	0.009 (0.61)
Capital expenditure(t-1)	-18.397 (-0.77)	-14.956 (-0.63)	-9.342 (-0.41)	-6.661 (-0.29)	22.272 (1.08)	35.588* (1.76)
Sales Growth(t-1)	-0.583 (-0.75)	-0.48 (-0.63)	-0.682 (-0.89)	-0.55 (-0.73)	0.08 (0.13)	0.135 (0.22)
Leverage	-2.476 (-0.45)	-1.921 (-0.35)	-1.035 (-0.19)	-0.363 (-0.07)	-0.053 (-0.01)	-1.017 (-0.21)
beta	-4.897** (-2.39)		-4.486** (-2.18)		-6.369*** (-3.35)	
Idiosyncratic Risk		-1.147*** (-3.92)		-1.146*** (-3.94)		-0.896*** (-3.39)
Profitability(t-1)	-12.786 (-1.34)	-21.403** (-2.22)	-11.564 (-1.21)	-19.908** (-2.06)	-17.546** (-1.96)	-25.163*** (-2.69)
Tangibility(t-1)	1.212 (0.23)	-0.642 (-0.13)				
Collateral(t-1)			-5.354 (-1.27)	-6.754 (-1.63)	-4.87 (-1.26)	-6.248 (-1.63)

Capital/labor	-1.656**	-1.464**	-1.091*	-0.947	0.14	0.249
	(-2.35)	(-2.11)	(-1.7)	(-1.5)	(0.26)	(0.45)
Wage/employees	2.177*	1.817	1.719	1.395	0.452	0.449
	(1.86)	(1.57)	(1.5)	(1.23)	(0.4)	(0.4)
R&D	319.235***	289.636***	328.429***	299.872***	579.508***	496.373***
	(2.84)	(2.62)	(2.93)	(2.72)	(5.19)	(4.47)
Director	-8.882***	-9.445***	-8.933***	-9.504***	2.618	2.058
	(-4.46)	(-4.78)	(-4.5)	(-4.83)	(1.26)	(0.99)
Group fixed effect	No	No	No	No	Yes	Yes
Number of Observations	619	619	619	619	619	619
Log Likelihood	-1518	-1513	-1517	-1512	-1280	-1280

Table 13
Value effect for family group firms

The regressions are performed using panel data of 169 family group firms in Hong Kong from 2009 to 2013. Family group firms are defined as firms whose largest owner control at least another one firm in the sample. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Director is a dummy which is equals to 1 when family members are involved in management and 0 otherwise. I use year fixed effect in the model. ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5	6	7	8	9	10	11
Intercept	5.073 ***	5.073 ***	4.446 ***	5.428 ***	4.617 ***	3.292 ***	3.852 ***	5.002 ***	4.802 ***	2.71* *	4***
	(6.4)	(4.27)	(4.9)	(4.57)	(5.31)	(3.2)	(4.04)	(3.51)	(3.19)	(2.01)	(2.78)
Ownership	0.004 *	0.004	0.011 **	0.004	0.008	0.004	0.007	0.003	0.007	0.004	0.007
	(1.73)	(1.11)	(2.02)	(0.92)	(1.46)	(1.03)	(1.36)	(0.78)	(1.47)	(0.86)	(1.34)
Wedge	-0.006	-0.006	0.013	-0.005	0.007	-0.002	0.009	-0.006	0.007	-0.003	0.009
	(-1.62)	(-0.94)	(1.6)	(-0.76)	(0.97)	(-0.24)	(1.23)	(-1.1)	(0.96)	(-0.55)	(1.32)
Size	0.19* **	0.19* **	0.157 ***	0.19* **	0.147 ***	0.118 **	0.134 ***	0.218 ***	0.182 ***	0.15* **	0.171 ***
	(-5.04)	(-3.28)	(-4.07)	(-3.22)	(-3.12)	(-2.4)	(-2.86)	(-3.76)	(-3.44)	(-3.01)	(-3.42)
Age	-0.004	-0.004	-0.003	-0.006	-0.004	-0.003	-0.003	0.008 *	0.006 *	-0.006	-0.004
	(-1.43)	(-0.85)	(-0.81)	(-1.13)	(-1.35)	(-0.64)	(-0.81)	(-1.77)	(-1.74)	(-1.19)	(-1.06)
Sales Growth(t-1)	0.031	0.031	0.029	0.042	0.029	0.034	0.025	0.048	0.031	0.041	0.028
	(0.67)	(0.79)	(0.68)	(1.06)	(0.79)	(0.86)	(0.69)	(1.29)	(0.82)	(1.13)	(0.78)
CapitalExpense/ Sales(t-1)	-0.101	-0.101	0.421 **	-0.025	-0.236	-0.062	-0.198	0.056	-0.238	0.022	-0.183
	(-0.9)	(-0.62)	(-2.45)	(-0.13)	(-1.24)	(-0.34)	(-1.14)	(0.31)	(-1.41)	(0.13)	(-1.15)
beta				0.213	-0.163			0.164	-0.272		
				(1.22)	(-0.94)			(1.03)	(-1.51)		
Idiosyncratic Risk						0.07* **	0.041 **			0.071 ***	0.038 **
						(2.75)	(2.2)			(2.78)	(2.1)
Profitability(t-1)				-1.439	0.729	-0.889	1.118	-1.272	0.657	-0.783	1
				(-0.96)	(0.55)	(-0.62)	(0.78)	(-0.85)	(0.48)	(-0.55)	(0.67)

Capital/labor								-	-	-	-
								0.107	0.087	0.105	0.086
								**	***	**	***
								(-1.42)	(-1.24)	(-1.32)	(-1.21)
								(-2.36)	(-2.69)	(-2.35)	(-2.72)
R&D								14.38	24.72	15.93	25.88
								1*	4***	7*	8***
								(1.66)	(3.66)	(1.78)	(3.76)
Director								0.316	0.339	0.364	0.343
								**	**	**	**
								(2.11)	(2.37)	(2.34)	(2.32)
Analyst coverage								0.066	0.053	0.065	0.042
								***	***	***	***
								(4.55)	(3.19)	(4.33)	(2.85)
Dividend								0	0	0	0
								(-0.46)	(-0.66)	(0.36)	(-0.02)
Leverage								0.307	0.615	0.29	0.499
									*		
								(0.96)	(1.84)	(0.87)	(1.34)
Collateral(t-1)								0.143	0.425	0.188	0.445
									**		**
								(0.47)	(2.17)	(0.59)	(2.18)
Wage/employees								0.147	0.082	0.167	0.085
								**	**	**	**
								(2.07)	(0.97)	(2.3)	(1)
Adjusted R-square	0.204	0.204	0.551	0.237	0.571	0.263	0.577	0.265	0.589	0.293	0.59
Number of Clusters	619	167	167	167	167	167	167	167	167	167	167
Group fixed effect	No	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Number of Observations	619	619	619	619	619	619	619	619	619	619	619

Table 14
Sample Description at 25% control level

Panel A and B present sample size description of total sample and subsample for Hong Kong firms between 2009 and 2013 when control threshold defined at 25% level. The ownership data are from annual report and OSIRIS Database.

Panel A Total sample					
	Dispersed ownership	Widely held company	Family	State	Total
No. of firms	219	54	815	172	1260
No. of observations	587	174	2821	668	4250
No. of observations with wedge		24	881	194	1099

Panel B Family controlled firms		
	Group firm	Non group firm
No. of firms	129	694
No. of observations	497	2324
No. of observations with wedge	258	623

Table 15
Factors associated with wedge for all firms at 25% control level

The regressions are performed using panel data of 1260 firms in Hong Kong from 2009 to 2013. The dependent variable is the wedge, calculated as difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. I use Tobit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

	Parameter	1	2	3	4
Transparency	Intercept	-24.437*** (-2.62)	-9.274 (-0.94)	-25.026*** (-2.69)	-10.05 (-1.03)
	age	0.138*** (3.35)	0.127*** (3.07)	0.137*** (3.33)	0.126*** (3.05)
	SIZE	1.315*** (4.17)	0.741** (2.36)	1.36*** (4.34)	0.79** (2.55)
	Analyst coverage	0.169 (0.84)	0.161 (0.8)	0.163 (0.81)	0.155 (0.77)
	Dividend	0.013 (1.3)	0.01 (0.97)	0.013 (1.23)	0.009 (0.9)
	Firm's growth and capital requirement	Capital expenditure(t-1)	-20.923* (-1.93)	-21.462** (-1.98)	-24.142** (-2.3)
Sales Growth(t-1)		-0.091 (-0.2)	-0.006 (-0.01)	-0.065 (-0.14)	0.016 (0.03)
Leverage		-9.306*** (-3.44)	-9.013*** (-3.33)	-9.465*** (-3.45)	-9.051*** (-3.3)
Risk	beta	-2.561** (-2.42)		-2.487** (-2.36)	
	Idiosyncratic Risk		-0.528*** (-3.03)		-0.526*** (-3.02)
Pledgeability of cash flows and assets	Profitability(t-1)	7.767* (1.72)	5.41 (1.18)	8.012* (1.77)	5.734 (1.25)
	Tangibility(t-1)	-3.735 (-1.39)	-3.938 (-1.46)		
	Collateral(t-1)			-1.701 (-0.77)	-2.267 (-1.02)
Technology	Capital/labor	-0.009	-0.047	-0.177	-0.193

	(-0.02)	(-0.12)	(-0.49)	(-0.53)
Wage/employees	-1.046*	-1.022*	-0.933	-0.914
	(-1.75)	(-1.71)	(-1.58)	(-1.55)
R&D	-12.55	-20.314	-14.17	-21.686
	(-0.32)	(-0.52)	(-0.36)	(-0.55)
Number of Observations	4250	4250	4250	4250
Log Likelihood	-6316	-6314	-6316	-6315

Table 16
Value effect of wedge for all firms when adding new variables

The regressions are performed using panel data of 1260 firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Numbers in parentheses are robust standard errors clustered at firm level. I add year and industry dummy to the model, industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5
Intercept	6.307*** (9.09)	4.71*** (6.1)	3.669*** (4.22)	4.431*** (5.95)	3.302*** (3.93)
Ownership	0.001 (0.48)	0.001 (0.72)	0.002 (0.78)	0.002 (0.73)	0.002 (0.76)
Wedge	-0.008** (-1.99)	-0.005 (-1.34)	-0.005 (-1.22)	-0.005 (-1.39)	-0.005 (-1.26)
Size	-0.217*** (-6.56)	-0.268*** (-8.44)	-0.227*** (-6.96)	-0.23*** (-7.44)	-0.188*** (-5.84)
Age	-0.01*** (-3.5)	-0.011*** (-3.58)	-0.01*** (-3.39)	-0.009*** (-3.16)	-0.008*** (-2.91)
Sales Growth(t-1)	0.054** (2.21)	0.046* (1.78)	0.04 (1.54)	0.066** (2.55)	0.061** (2.34)
CapitalExpense/Sales(t-1)	0.15 (0.67)				
Analyst coverage		0.076*** (5.87)	0.077*** (5.83)	0.071*** (5.46)	0.071*** (5.4)
Capital expenditure(t-1)		2.055*** (2.97)	2.13*** (3.08)	2.167*** (3.31)	2.186*** (3.36)
Leverage		0.936*** (2.83)	0.914*** (2.69)	1.109*** (3.45)	1.078*** (3.27)
beta		0.191*** (2.79)		0.193*** (2.91)	
Idiosyncratic Risk			0.033** (2.1)		0.037** (2.52)
Profitability(t-1)		0.095 (0.13)	0.246 (0.33)	-0.12 (-0.17)	0.033 (0.04)

Wage/employees		0.195***	0.197***	0.283***	0.284***
		(4.49)	(4.52)	(6.38)	(6.39)
Dividend				0.001	0.001*
				(1.2)	(1.73)
Collateral(t-1)				0.262	0.303
				(1.3)	(1.51)
Capital/labor				-0.136***	-0.134***
				(-5.28)	(-5.24)
R&D				12.27***	12.769***
				(2.62)	(2.76)
Adjusted R-square	0.134	0.189	0.189	0.217	0.218
Number of Clusters	1163	1163	1163	1163	1163
Number of Observations	4250	4250	4250	4250	4250

Table 17
Factors associated with wedge for family controlled firms at 25% control level

The regressions are performed using panel data of 815 family controlled firms in Hong Kong from 2009 to 2013. Family controlled firms are defined as firms whose ultimate owner is an individual. The dependent variable is the wedge, calculated as difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Director is a dummy which is equals to 1 when family members are involved in management and 0 otherwise. I use Tobit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4
Intercept	-32.956*** (-3.08)	-23.333** (-2.08)	-33.082*** (-3.12)	-23.133** (-2.08)
age	0.102** (2.37)	0.098** (2.27)	0.111*** (2.58)	0.106** (2.46)
SIZE	2.359*** (6.33)	1.984*** (5.33)	2.313*** (6.34)	1.93*** (5.31)
Analyst coverage	0.027 (0.12)	0.022 (0.1)	0.011 (0.05)	0.007 (0.03)
Dividend	0.007 (0.69)	0.006 (0.58)	0.007 (0.67)	0.006 (0.54)
Capital expenditure(t-1)	-36.955*** (-3.22)	-37.492*** (-3.27)	-35.717*** (-3.24)	-35.792*** (-3.25)
Sales Growth(t-1)	0.175 (0.36)	0.203 (0.41)	0.159 (0.33)	0.185 (0.38)
Leverage	-10.572*** (-3.48)	-10.199*** (-3.37)	-8.856*** (-2.88)	-8.397*** (-2.74)
beta	-1.96* (-1.79)		-1.819* (-1.66)	
Idiosyncratic Risk		-0.309* (-1.75)		-0.33* (-1.88)
Profitability(t-1)	0.599 (0.13)	-0.707 (-0.15)	1.528 (0.33)	0.142 (0.03)
Tangibility(t-1)	-4.49 (-1.51)	-4.377 (-1.47)		
Collateral(t-1)			-7.522*** (-3.12)	-7.812*** (-3.24)

Capital/labor	-0.35 (-0.82)	-0.39 (-0.92)	-0.209 (-0.54)	-0.224 (-0.58)
Wage/employees	-0.599 (-0.92)	-0.573 (-0.88)	-0.593 (-0.93)	-0.578 (-0.91)
R&D	63.113 (1.44)	60.4 (1.38)	61.024 (1.4)	58.488 (1.34)
Director	-9.533*** (-6.52)	-9.793*** (-6.69)	-9.394*** (-6.44)	-9.65*** (-6.61)
Number of Observations	2821	2821	2821	2821
Log Likelihood	-4803	-4803	-4799	-4799

Table 18
Value effect of wedge for family controlled firms at 25% control level

The regressions are performed using panel data of 815 family controlled firms in Hong Kong from 2009 to 2013. Family controlled firms are defined as firms whose ultimate owner is an individual. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense scaled by total assets. Director is a dummy which is equals to 1 when family members are involved in management and 0 otherwise. Numbers in parentheses are robust standard errors clustered at firm level. I add year and industry dummy to the model, industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5
Intercept	7.89*** (7.99)	8.212*** (8.2)	6.683*** (6.07)	5.811*** (5.99)	4.362*** (3.74)
Ownership	-0.002 (-0.67)	-0.001 (-0.46)	-0.001 (-0.48)	0.001 (0.19)	0 (0.12)
Wedge	-0.009* (-1.8)	-0.008 (-1.61)	-0.007 (-1.45)	-0.006 (-1.27)	-0.005 (-1.14)
Size	-0.283*** (-6.34)	-0.307*** (-6.57)	-0.252*** (-5.28)	-0.286*** (-6.33)	-0.237*** (-4.85)
Age	-0.012*** (-3.36)	-0.009*** (-2.69)	-0.008** (-2.52)	-0.012*** (-2.92)	-0.01*** (-2.59)
Sales Growth(t-1)	0.1*** (2.8)	0.098*** (2.83)	0.094*** (2.75)	0.098*** (2.59)	0.094** (2.46)
CapitalExpense/Sales(t-1)	0.275 (0.76)	1.714** (2.35)	1.734** (2.38)	1.836** (2.25)	1.782** (2.23)
Capital expenditure(t-1)					
Leverage		0.51 (1.39)	0.422 (1.08)	0.616 (1.5)	0.565 (1.35)
beta		0.168** (2.34)		0.152** (2.27)	
Idiosyncratic Risk			0.054** (2.58)		0.056*** (3.16)
Collateral(t-1)		-0.339 (-1.27)	-0.287 (-1.08)	-0.061 (-0.24)	-0.021 (-0.08)

Director	0.053	0.107	0.025	0.071
	(0.37)	(0.73)	(0.19)	(0.51)
Analyst coverage			0.094***	0.093***
			(5.38)	(5.3)
Dividend			0	0.001
			(0.23)	(0.98)
Profitability(t-1)			0.065	0.319
			(0.07)	(0.33)
Capital/labor			-0.115***	0.268***
			(-3.61)	(4.6)
Wage/employees			0.272***	-0.111***
			(4.59)	(-3.58)
R&D			15.149**	15.325**
			(2.38)	(2.47)
Adjusted R-square	0.177	0.184	0.192	0.239
Number of Clusters	815	815	815	815
Number of Observations	2821	2821	2821	2821

Table 19
Factors associated with wedge for family group firms at 25% control level

The regressions are performed using panel data of 129 family group firms in Hong Kong from 2009 to 2013. Family group firms are defined as firms whose largest owner control at least another one firm in the sample. The dependent variable is the wedge, calculated as difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Director is a dummy which is equals to 1 when family members are involved in management and 0 otherwise. I use Tobit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5	6
Intercept	-49.962** (-2.54)	-11.82 (-0.56)	-46.669** (-2.4)	-10.203 (-0.49)	31.409 (1.45)	56.039** (2.44)
age	-0.153** (-2.51)	-0.191*** (-3.13)	-0.144** (-2.38)	-0.181*** (-2.99)	-0.226*** (-4.34)	-0.233*** (-4.46)
SIZE	2.938*** (4.2)	1.679** (2.36)	2.756*** (4)	1.589** (2.26)	-1.353* (-1.87)	-2.38*** (-3.17)
Analyst coverage	0.38 (1.29)	0.388 (1.35)	0.36 (1.23)	0.374 (1.31)	0.502** (2.21)	0.348 (1.59)
Dividend	0.03 (1.61)	0.021 (1.12)	0.031* (1.68)	0.021 (1.14)	0.011 (0.79)	0.012 (0.81)
Capital expenditure(t-1)	-23.123 (-0.81)	-17.46 (-0.62)	-12.672 (-0.46)	-7.96 (-0.29)	3.305 (0.14)	15.581 (0.67)
Sales Growth(t-1)	-0.3 (-0.33)	-0.192 (-0.22)	-0.401 (-0.45)	-0.266 (-0.31)	-0.281 (-0.44)	-0.256 (-0.4)
Leverage	5.978 (0.86)	6.173 (0.9)	8.268 (1.18)	8.249 (1.2)	10.055 (1.64)	10.168* (1.65)
beta	-3.38 (-1.43)		-2.59 (-1.1)		-6.723*** (-3.11)	
Idiosyncratic Risk		-1.229*** (-3.83)		-1.196*** (-3.77)		-0.914*** (-3.1)
Profitability(t-1)	-17.715 (-1.5)	-28.119** (-2.37)	-16.266 (-1.38)	-26.241** (-2.22)	-15.118 (-1.43)	-22.677** (-2.07)
Tangibility(t-1)	-0.154 (-0.03)	-1.072 (-0.19)				
Collateral(t-1)			-9.289* (-1.95)	-9.495** (-2.05)	-5.603 (-1.35)	-6.957* (-1.7)

Capital/labor	-1.66**	-1.597**	-0.827	-0.838	-0.075	0.019
	(-2.07)	(-2.04)	(-1.14)	(-1.18)	(-0.13)	(0.03)
Wage/employees	2.402*	2.064	1.775	1.492	1.819	1.724
	(1.85)	(1.62)	(1.42)	(1.22)	(1.5)	(1.43)
R&D	248.548	251.212	252.759	253.416*	503.517***	381.665***
	(1.57)	(1.62)	(1.61)	(1.64)	(3.64)	(2.74)
Director	-12.695***	-12.701***	-13.186***	-13.155***	-0.748	-0.824
	(-5.1)	(-5.17)	(-5.31)	(-5.38)	(-0.29)	(-0.31)
Group fixed effect	No	No	No	No	Yes	Yes
Number of Observations	497	497	497	497	497	497
Log Likelihood	-1264	-1257	-1262	-1255	-1070	-1070

Table 20
Value effect for family group firms at 25% control level

The regressions are performed using panel data of 129 family group firms in Hong Kong from 2009 to 2013. Family group firms are defined as firms whose largest owner control at least another one firm in the sample. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Director is a dummy which is equals to 1 when family members are involved in management and 0 otherwise. I use year fixed effect in the model. ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5	6	7	8	9	10	11
Intercept	4.777*** (4.6)	4.777*** (3.07)	2.38*** (2.94)	4.687*** (3.02)	2.554*** (2.71)	2.162* (1.69)	1.855* (1.86)	4.593*** (2.74)	2.441 (1.48)	1.944 (1.26)	1.608 (1.02)
Ownership	0.005* (1.66)	0.005 (1.03)	0.01* (1.67)	0.006 (1.36)	0.009 (1.44)	0.007 (1.41)	0.007 (1.23)	0.005 (1.09)	0.007 (1.22)	0.005 (1.19)	0.006 (0.99)
Wedge	-0.004 (-0.99)	-0.004 (-0.57)	0.015** (2.02)	-0.001 (-0.07)	0.013* (1.83)	0.003 (0.39)	0.015** (2.05)	-0.003 (-0.43)	0.011 (1.45)	0 (0.06)	0.013* (1.75)
Size	-0.173*** (-3.8)	-0.173** (-2.51)	-0.112*** (-3.06)	-0.188** (-2.51)	-0.133*** (-2.74)	-0.096 (-1.62)	-0.116** (-2.39)	-0.198*** (-2.67)	-0.118** (-2.09)	-0.114* (-1.82)	-0.102* (-1.83)
Age	-0.004 (-1.24)	-0.004 (-0.75)	-0.003 (-1.29)	-0.007 (-1.39)	-0.005* (-1.8)	-0.004 (-0.75)	-0.004 (-1.2)	-0.009* (-1.86)	-0.007* (-1.95)	-0.006 (-1.22)	-0.004 (-1.27)
Sales Growth(t-1)	0.023 (0.39)	0.023 (0.43)	0.02 (0.34)	0.025 (0.44)	0.015 (0.33)	0.02 (0.35)	0.009 (0.21)	0.04 (0.73)	0.021 (0.46)	0.035 (0.65)	0.016 (0.36)
CapitalExpense/Sales(t-1)	-0.211* (-1.24)	-0.211 (-0.75)	-0.365* (-1.29)	-0.138 (-1.39)	-0.264 (-1.8)	-0.216 (-0.75)	-0.228 (-1.2)	-0.047 (-1.86)	-0.174 (-1.95)	-0.117 (-1.22)	-0.129 (-1.27)

	(-1.7)	(-1.13)	(-1.83)	(-0.7)	(-1.17)	(-1.14)	(-1.08)	(-0.24)	(-0.89)	(-0.62)	(-0.69)
beta				0.382*	-0.181		0.045**	0.283	-0.274		
				(1.91)	(-0.92)		(2.04)	(1.53)	(-1.32)		
Idiosyncratic Risk						0.082***	1.307			0.078***	0.041*
						(2.91)	(0.64)			(2.84)	(1.9)
Profitability(t-1)				-2.013	0.868	-1.15	0.185	-2.005	0.776	-1.283	1.153
				(-1.06)	(0.48)	(-0.61)	(0.79)	(-1.03)	(0.41)	(-0.67)	(0.55)
Collateral(t-1)				-0.252	0.204	-0.192	31.681***	0.121	0.499**	0.181	0.479**
				(-0.94)	(0.88)	(-0.73)	(3.05)	(0.35)	(2.16)	(0.52)	(1.98)
R&D				19.208	29.874***	19.082	0.457***	19.415	27.89***	19.735	28.443***
				(1.27)	(2.94)	(1.24)	(3.09)	(1.24)	(2.9)	(1.27)	(2.95)
Director				0.361**	0.441***	0.418**		0.399**	0.479***	0.449**	0.475***
				(2.19)	(3.08)	(2.43)		(2.22)	(3.7)	(2.41)	(3.51)
Analyst coverage								0.055***	0.037**	0.054***	0.026*
								(3.61)	(2.37)	(3.45)	(1.92)
Dividend								0	-0.001	0	0
								(-0.36)	(-1.22)	(0.26)	(-0.53)
Leverage								0.057	0.293	-0.006	0.185
								(0.15)	(0.74)	(-0.01)	(0.44)
Capital/labor								-0.096*	-0.101***	-0.095*	-0.096***
								(-1.84)	(-2.89)	(-1.87)	(-2.83)
Wage/employees								0.134	0.084	0.156*	0.09
								(1.66)	(0.9)	(1.93)	(0.93)
Adjusted R-square	0.221	0.221	0.577	0.266	0.594	0.292	0.601	0.287	0.606	0.316	0.608
Number of Clusters	497	129	129	129	129	129	129	129	129	129	129
Group fixed effect	No	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Number of Observations	497	497	497	497	497	497	497	497	497	497	497

Table 21
Regression value on residual from Table 5 in Claessens, Djankov et al.(2002)
model at 10% control level

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is residual which is the difference between wedge and uncensored dependent value from Table 5, Size, age, sales growth and capital expenditure/sales are control variables, size is the logarithm of book value of assets, age is the number of years since the firm incorporation, sales growth and capital expenditure/sales are from previous period. Numbers in parentheses are robust standard errors clustered at firm level. ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

	1	2	3	4
Intercept	6.265*** (9.16)	6.261*** (9.1)	6.301*** (9.15)	6.293*** (9.09)
Ownership	0.003 (1.57)	0.003 (1.58)	0.003 (1.49)	0.003 (1.51)
Residual	0.004 (0.96)	0.004 (1.01)	0.003 (0.68)	0.003 (0.76)
Size	-0.224*** (-6.67)	-0.224*** (-6.65)	-0.224*** (-6.67)	-0.224*** (-6.65)
Age	-0.009*** (-3.1)	-0.009*** (-3.11)	-0.009*** (-3.16)	-0.009*** (-3.16)
Sales Growth(t-1)	0.061** (2.37)	0.061** (2.37)	0.061** (2.36)	0.061** (2.36)
CapitalExpense/Sales(t-1)	0.166 (0.71)	0.166 (0.71)	0.17 (0.73)	0.169 (0.73)
Adjusted R-square	0.134	0.134	0.134	0.134
Number of Clusters	1152	1152	1152	1152
Number of Observations	4185	4185	4185	4185

Table 22
Regression value on residual from Table 8 in Claessens, Djankov et al.(2002)
model for family controlled firms at 10% control level

The regressions are performed using panel data of 950 family controlled firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is residual which is the difference between wedge and uncensored predicted dependent value from Table 5, Size, age, sales growth and capital expenditure/sales are control variables, size is the logarithm of book value of assets, age is the number of years since the firm incorporation, sales growth and capital expenditure/sales are from previous period. Numbers in parentheses are robust standard errors clustered at firm level. ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

	1	2	3	4
Intercept	7.917*** (8.9)	7.889*** (8.81)	7.919*** (8.97)	7.884*** (8.88)
Ownership	0 (0.23)	0.001 (0.27)	0 (0.24)	0.001 (0.28)
Residual	-0.002 (-0.6)	-0.002 (-0.44)	-0.002 (-0.61)	-0.002 (-0.42)
Size	-0.293*** (-7.08)	-0.292*** (-7.03)	-0.293*** (-7.11)	-0.292*** (-7.07)
Age	-0.01*** (-2.96)	-0.01*** (-2.95)	-0.01*** (-2.96)	-0.01*** (-2.94)
Sales Growth(t-1)	0.071** (2.35)	0.071** (2.35)	0.071** (2.35)	0.071** (2.35)
CapitalExpense/Sales(t-1)	0.31 (1.13)	0.309 (1.12)	0.31 (1.13)	0.308 (1.12)
Adjusted R-square	0.162	0.162	0.162	0.162
Number of Clusters	950	950	950	950
Number of Observations	3313	3313	3313	3313

Table 23
Regression value on residual from Table 14 in Claessens, Djankov et al.(2002)
model for family controlled firms at 25% control level

The regressions are performed using panel data of 1260 firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is residual which is the difference between wedge and uncensored predicted dependent value from Table 5, Size, age, sales growth and capital expenditure/sales are control variables, size is the logarithm of book value of assets, age is the number of years since the firm incorporation, sales growth and capital expenditure/sales are from previous period. Numbers in parentheses are robust standard errors clustered at firm level. ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

	1	2	3	4
Intercept	6.095*** (9.28)	6.064*** (9.13)	6.128*** (9.24)	6.095*** (9.1)
Ownership	0.003 (1.41)	0.003 (1.48)	0.003 (1.35)	0.003 (1.42)
Residual	0.005 (1.25)	0.006 (1.47)	0.004 (1.06)	0.005 (1.29)
Size	-0.217*** (-6.72)	-0.216*** (-6.67)	-0.217*** (-6.71)	-0.217*** (-6.66)
Age	-0.009*** (-3.17)	-0.009*** (-3.15)	-0.01*** (-3.23)	-0.009*** (-3.2)
Sales Growth(t-1)	0.055** (2.25)	0.055** (2.26)	0.055** (2.25)	0.055** (2.25)
CaptialExpense/Sales(t-1)	0.146 (0.66)	0.143 (0.65)	0.149 (0.67)	0.146 (0.66)
Adjusted R-square	0.133	0.133	0.132	0.133
Number of Clusters	1163	1163	1163	1163
Number of Observations	4250	4250	4250	4250

Table 24
Regression value on residual from Table 16 in Claessens, Djankov et al.(2002)
model for family controlled firms at 25% control level

The regressions are performed using panel data of 815 family controlled firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is residual which is the difference between wedge and uncensored predicted dependent value from Table 5, Size, age, sales growth and capital expenditure/sales are control variables, size is the logarithm of book value of assets, age is the number of years since the firm incorporation, sales growth and capital expenditure/sales are from previous period. Numbers in parentheses are robust standard errors clustered at firm level. ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

	1	2	3	4
Intercept	7.998*** (7.86)	7.934*** (7.78)	8.031*** (7.96)	7.957*** (7.88)
Ownership	0 (-0.17)	0 (-0.07)	-0.001 (-0.22)	0 (-0.1)
Residual	-0.004 (-0.89)	-0.003 (-0.62)	-0.005 (-1.04)	-0.003 (-0.73)
Size	-0.291*** (-6.35)	-0.29*** (-6.3)	-0.292*** (-6.4)	-0.29*** (-6.35)
Age	-0.012*** (-3.41)	-0.012*** (-3.38)	-0.012*** (-3.44)	-0.012*** (-3.4)
Sales Growth(t-1)	0.099*** (2.78)	0.099*** (2.78)	0.098*** (2.78)	0.099*** (2.78)
CapitalExpense/Sales(t-1)	0.303 (0.83)	0.299 (0.82)	0.304 (0.84)	0.299 (0.83)
Adjusted R-square	0.176	0.175	0.176	0.175
Number of Clusters	815	815	815	815
Number of Observations	2821	2821	2821	2821

Table 25
Determination of dummy wedge for all firms-Part of factors

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is the wedge, which is a dummy variable that equals to 1 when wedge is greater than 0 and equals to 0 otherwise, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. I use Probit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Variable	1	2	3	4	5	6	7
Intercept	-	-	-	-	-	-	-
	2.193*	0.54**	0.741*	0.54**	0.507*	0.527*	1.083*
	**	*	**	*	**	**	*
	(0.47)	(0.14)	(0.14)	(0.15)	(0.14)	(0.14)	(0.52)
age	0.008*						
	**						
	(0)						
SIZE	0.056*						
	**						
	(0.02)						
Transparency							
Analyst coverage	0.02						
	(0.02)						
Dividend	0.001						
	(0)						
Capital expenditure(t-1)		-					
		2.36**					
		*					
		(0.77)					
Firm's growth and capital requirement							
Sales Growth(t-1)		-0.005					
		(0.04)					
Leverage		-					
		0.929*					
		**					
		(0.2)					
beta			-0.077				
			(0.07)				
Risk							
Idiosyncratic Risk				-			
				0.036*			
				**			

		(0.01)							
Pledgeability of cash flows and assets	Profitability(t-1)					0.471	0.528*		
						(0.31)	(0.31)		
	Tangibility(t-1)					-	0.843*		
						**	(0.17)		
	Collateral(t-1)						-	0.699*	
							**	(0.15)	
Technology	Capital/labor							-0.033	
								(0.02)	
	Wage/employees							-	0.121*
								**	(0.04)
	R&D							1.283	
								(2.94)	
	Number of Observations	4185	4185	4185	4185	4185	4185	4185	4185

Table 26
Determination of dummy wedge-All factors

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is the wedge, which is a dummy variable that equals to 1 when wedge is greater than 0 and equals to 0 otherwise, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. I use Logit model in this table and control year and industry fixed effect. Industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

	Variable	var1	var1	var1	var1
Transparency	Intercept	-0.527 (0.74)	0.218 (0.78)	-0.604 (0.74)	0.121 (0.78)
	age	0.008** (0)	0.008** (0)	0.008** (0)	0.007** (0)
	SIZE	0.082*** (0.02)	0.051** (0.02)	0.088*** (0.02)	0.058** (0.02)
	Analyst coverage	0.027* (0.02)	0.026 (0.02)	0.026 (0.02)	0.025 (0.02)
	Dividend	0 (0)	0 (0)	0 (0)	0 (0)
	Capital expenditure(t-1)	-1.904** (0.88)	-1.95** (0.88)	-2.338*** (0.85)	-2.361*** (0.85)
Firm's growth and capital requirement	Sales Growth(t-1)	-0.009 (0.04)	-0.005 (0.04)	-0.006 (0.04)	-0.002 (0.04)
	Leverage	-0.765*** (0.21)	-0.751*** (0.21)	-0.744*** (0.22)	-0.724*** (0.22)
Risk	beta	-0.187** (0.08)		-0.174** (0.08)	
	Idiosyncratic Risk		-0.02 (0.01)		-0.021 (0.01)
Pledgeability of cash flows and assets	Profitability(t-1)	0.263 (0.35)	0.192 (0.36)	0.327 (0.35)	0.255 (0.36)
	Tangibility(t-1)	-0.672*** (0.22)	-0.671*** (0.22)		
	Collateral(t-1)			-0.466***	-0.489***

				(0.18)	(0.18)
Technology	Capital/labor	0.02	0.017	0.001	0
		(0.03)	(0.03)	(0.03)	(0.03)
	Wage/employees	-0.164***	-0.164***	-0.15***	-0.15***
		(0.05)	(0.05)	(0.05)	(0.05)
	R&D	1.957	1.585	1.774	1.422
	(3)	(3.01)	(3)	(3.01)	
	Number of Observations	4185	4185	4185	4185

Table 27
The impact of Chinese firm

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable include wedge which is the difference between control right and ownership, ChineseFirm which equals to 1 if firm is red-chip companies and 0 otherwise and the interaction term of ChineseFirm and wedge, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Numbers in parentheses are robust standard errors clustered at firm level. I add year and industry dummy to the model, industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5
Intercept	6.918*** (8.84)	5.222*** (5.77)	4.161*** (4.43)	5.201*** (5.72)	4.167*** (4.39)
Ownership	0.001 (0.37)	0.001 (0.64)	0.001 (0.74)	0.002 (0.78)	0.002 (0.84)
Wedge	-0.008* (-1.86)	-0.006 (-1.33)	-0.005 (-1.16)	-0.005 (-1.31)	-0.005 (-1.15)
ChineseFirm	0.338*** (2.87)	0.297*** (2.82)	0.314*** (2.93)	0.3*** (2.84)	0.317*** (2.95)
Wedge*ChineseFirm	-0.005 (-0.59)	-0.005 (-0.61)	-0.006 (-0.72)	-0.005 (-0.62)	-0.006 (-0.73)
Size	-0.245*** (-6.54)	-0.292*** (-7.5)	-0.25*** (-6.76)	-0.291*** (-7.42)	-0.251*** (-6.64)
Age	-0.01*** (-3.45)	-0.011*** (-4.25)	-0.011*** (-4.08)	-0.011*** (-4.2)	-0.011*** (-4.07)
Sales Growth(t-1)	0.063** (2.43)	0.053** (2.07)	0.049* (1.93)	0.052** (2.03)	0.048* (1.9)
CapitalExpense/Sales(t-1)	0.201 (0.85)				
Analyst coverage		0.079*** (6)	0.08*** (5.98)	0.079*** (5.97)	0.08*** (5.96)
Capital expenditure(t-1)		2.149*** (3.04)	2.23*** (3.14)	2.312*** (3.62)	2.379*** (3.7)
Leverage		0.881*** (2.99)	0.832*** (2.68)	0.924*** (3.03)	0.868*** (2.7)

beta		0.178**		0.178**	
		(2.52)		(2.52)	
Idiosyncratic Risk			0.034**		0.033**
			(2.06)		(2)
Tangibility(t-1)		0.018	0.041		
		(0.07)	(0.16)		
Collateral(t-1)				-0.115	-0.073
				(-0.58)	(-0.37)
Wage/employees		0.196***	0.197***	0.198***	0.199***
		(4.47)	(4.49)	(4.52)	(4.53)
Adjusted R-square	0.142	0.195	0.197	0.196	0.197
Number of Clusters	1152	1152	1152	1152	1152
Number of Observations	4185	4185	4185	4185	4185

Table 28
The impact of GEM firm

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable include wedge which is the difference between control right and ownership, GEM which equals to 1 if firm is listed on GEM board and 0 otherwise and the interaction term of GEM and wedge, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Numbers in parentheses are robust standard errors clustered at firm level. I add year and industry dummy to the model, industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5
Intercept	6.352*** (8.91)	4.734*** (5.54)	3.655*** (4.09)	4.715*** (5.48)	3.661*** (4.05)
Ownership	0.001 (0.62)	0.002 (0.88)	0.002 (0.94)	0.002 (1)	0.002 (1.03)
Wedge	-0.008** (-2.1)	-0.006 (-1.48)	-0.005 (-1.38)	-0.005 (-1.45)	-0.005 (-1.37)
GEM	0.141 (0.44)	0.149 (0.5)	0.06 (0.21)	0.137 (0.46)	0.052 (0.18)
Wedge*GEM	-0.002 (-0.08)	-0.004 (-0.21)	-0.001 (-0.05)	-0.004 (-0.2)	-0.001 (-0.04)
Size	-0.22*** (-6.47)	-0.271*** (-7.42)	-0.228*** (-6.57)	-0.27*** (-7.34)	-0.228*** (-6.45)
Age	-0.009*** (-3.33)	-0.011*** (-4.12)	-0.01*** (-3.98)	-0.01*** (-4.06)	-0.01*** (-3.96)
Sales Growth(t-1)	0.059** (2.23)	0.05* (1.91)	0.046* (1.77)	0.049* (1.86)	0.045* (1.73)
CapitalExpense/Sales(t-1)	0.167 (0.71)				
Analyst coverage		0.077*** (6.13)	0.078*** (6.12)	0.077*** (6.12)	0.078*** (6.11)
Capital expenditure(t-1)		2.032*** (2.84)	2.108*** (2.94)	2.218*** (3.43)	2.278*** (3.51)
Leverage		0.919***	0.874***	0.963***	0.911***

		(3.08)	(2.78)	(3.11)	(2.79)
beta		0.195***		0.194***	
		(2.72)		(2.72)	
Idiosyncratic Risk			0.034**		0.033**
			(2.08)		(2.02)
Tangibility(t-1)		0.052	0.072		
		(0.2)	(0.28)		
Collateral(t-1)				-0.09	-0.051
				(-0.45)	(-0.26)
Wage/employees		0.195***	0.198***	0.198***	0.199***
		(4.49)	(4.53)	(4.55)	(4.57)
Adjusted R-square	0.135	0.19	0.191	0.19	0.191
Number of Clusters	1152	1152	1152	1152	1152
Number of Observations	4185	4185	4185	4185	4185

Table 29
value effect for state owned firm

The regressions are performed using panel data of 184 state owned firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Numbers in parentheses are robust standard errors clustered at firm level. I add year and industry dummy to the model, industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2
Intercept	5.082*** (2.7)	3.207** (2.12)
Ownership	0.004 (0.64)	0.004 (0.76)
Wedge	-0.005 (-0.7)	-0.001 (-0.08)
Size	-0.204** (-2)	-0.196** (-2.58)
Age	-0.001 (-0.33)	0.001 (0.13)
Sales Growth(t-1)	0.063 (0.97)	0.071 (0.92)
CapitalExpense/Sales(t-1)	-0.018 (-0.07)	-0.018 (-0.09)
Analyst coverage		0.021* (1.73)
Dividend		0.001 (0.82)
Leverage		1.298*** (2.84)
Beta		0.15 (1.02)
Profitability(t-1)		-1.155

		(-0.59)
Collateral(t-1)		0.395
		(1.55)
Capital/labor		-0.072
		(-1.48)
Wage/employees		0.195***
		(2.88)
R&D		10.937
		(1.6)
Adjusted R-square	0.154	0.272
Number of Clusters	184	184
Number of Observations	715	715

Table 30
Replace wedge with dividend payout ratio in Claessens et al.(2002) model

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is dividend payout ratio. Size, age, sales growth and capital expenditure/sales are control variables, size is the logarithm of book value of assets, age is the number of years since the firm incorporation, sales growth and capital expenditure/sales are from previous period. Numbers in parentheses are robust standard errors clustered at firm level. ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1
Intercept	6.378*** (9)
Ownership	0.003 (1.42)
Dividend payout	0.00006 (0.1)
Size	-0.226*** (-6.65)
Age	-0.01*** (-3.33)
SalesGrowth(t-1)	0.061** (2.36)
CaptialExpenditure/Sales(t-1)	0.177 (0.76)
Adjusted R-square	0.133
Number of Clusters	1152
Number of Observations	4185

Table 31
Value effect of wedge when adding firm characteristics (using log(Tobin's Q) as dependent variable)

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is Log(Tobin's Q), calculated as log of the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, dividend is the dividend payout ratio, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, idiosyncratic risk is the standard error of the same market model, profitability(t-1) is the EBIT of previous year, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, collateral(t-1) is the ratio of the sum of tangible assets and inventories to total assets, capital/labor is the ratio of capital expense to number of employees, wage/employees is the average wage expense, R&D is the R&D expense. Numbers in parentheses are robust standard errors clustered at firm level. I add year and industry dummy to the model, industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5	6
Intercept	2.202*** (12.33)	1.557*** (6.58)	1.336*** (5.51)	1.55*** (6.55)	1.333*** (5.48)	1.561*** (7.23)
Ownership	0 (0.45)	0 (0.82)	0 (0.83)	0.001 (0.9)	0.001 (0.89)	0 (0.52)
Wedge	-0.002* (-1.74)	-0.001 (-1.1)	-0.001 (-1.09)	-0.001 (-1.08)	-0.001 (-1.07)	-0.002 (-1.34)
Size	-0.063*** (-7.57)	-0.081*** (-9.4)	-0.071*** (-8.78)	-0.08*** (-9.35)	-0.071*** (-8.69)	-0.074*** (-9.78)
Age	-0.004*** (-3.98)	-0.005*** (-4.71)	-0.005*** (-4.66)	-0.004*** (-4.71)	-0.005*** (-4.67)	-0.003*** (-3.58)
Sales Growth(t-1)	0.025*** (3.65)	0.02*** (2.98)	0.019*** (2.86)	0.02*** (2.97)	0.019*** (2.85)	0.024*** (3.38)
CapitalExpense/Sales(t-1)	0.015 (0.27)					
Analyst coverage		0.03*** (7.7)	0.03*** (7.7)	0.03*** (7.68)	0.03*** (7.69)	0.027*** (7.17)
Capital expenditure(t-1)		0.955*** (4.82)	0.974*** (4.9)	0.961*** (5.15)	0.976*** (5.21)	0.882*** (4.94)
Leverage		0.333*** (5.14)	0.326*** (4.82)	0.339*** (5.1)	0.33*** (4.75)	0.419*** (6.05)
beta		0.049** (2.36)		0.05** (2.39)		0.056*** (2.8)
Idiosyncratic Risk			0.006 (1.52)		0.006 (1.48)	
Tangibility(t-1)		-0.025 (-0.42)	-0.022 (-0.37)			
Collateral(t-1)				-0.038	-0.031	0.064

Wage/employees				(-0.77)	(-0.62)	(1.21)
	0.074***	0.074***	0.074***	0.074***	0.075***	0.103***
	(5.83)	(5.83)	(5.85)	(5.84)	(5.84)	(7.78)
Dividend						0
						(1.37)
Profitability(t-1)						0.258
						(1.63)
Capital/labor						-0.044***
						(-5.79)
R&D						3.587***
						(3.08)
Adjusted R-square	0.15	0.234	0.233	0.235	0.233	0.27
Number of Clusters	1152	1152	1152	1152	1152	1152
Number of Observations	4185	4185	4185	4185	4185	4185

Table 32
Value effect of wedge when adding firm characteristics one by one

The regressions are performed using panel data of 1202 firms in Hong Kong from 2009 to 2013. The dependent variable is Tobin's Q, calculated as the ratio of market value of stock plus book value of debt and book value of preferred stock to book value of assets. The main independent variable is wedge which is the difference between control right and ownership, age is the number of years since the firm incorporation, size is the logarithm of book value of assets, analyst coverage is the number of the analyst covering the firm, capital expenditure is the ratio of capital expense to total asset of previous period, sales growth is from previous year, leverage is the ratio of total debt to total assets, beta is the systematic risk measured as the coefficient of market return when regression market model with daily stock returns for one year and Hang Seng index as the benchmark, tangibility(t-1) is the ratio of the tangible assets to total assets in previous year, wage/employees is the average wage expense. Numbers in parentheses are robust standard errors clustered at firm level. I add year and industry dummy to the model, industry classification is from Campbell (1996). ***indicates significance at 1% level, **indicates significance at 5% level and * indicate significance at 10% level.

Parameter	1	2	3	4	5	6
Intercept	6.409*** (9.03)	6.98*** (9.56)	6.969*** (9.81)	7.283*** (9.76)	7.275*** (9.89)	4.775*** (5.62)
Ownership	0.001 (0.58)	0.001 (0.55)	0.001 (0.73)	0.002 (0.91)	0.002 (0.82)	0.002 (0.84)
Wedge	-0.008** (-2.17)	-0.009** (-2.3)	-0.007* (-1.92)	-0.006* (-1.72)	-0.006* (-1.72)	-0.006 (-1.56)
Size	-0.222*** (-6.56)	-0.253*** (-7.4)	-0.261*** (-7.61)	-0.282*** (-7.64)	-0.282*** (-7.6)	-0.273*** (-7.45)
Age	-0.01*** (-3.35)	-0.01*** (-3.84)	-0.01*** (-3.61)	-0.009*** (-3.37)	-0.009*** (-3.51)	-0.011*** (-4.14)
Sales Growth(t-1)	0.06** (2.31)	0.06** (2.36)	0.058** (2.28)	0.06** (2.36)	0.061** (2.43)	0.05** (1.97)
CapitalExpense/Sales(t-1)	0.166 (0.71)					
Capital expenditure(t-1)		2.073*** (3.46)	1.829*** (2.9)	1.785*** (2.83)	1.648** (2.32)	2.027*** (2.84)
Analyst coverage		0.086*** (6.64)	0.085*** (6.62)	0.084*** (6.52)	0.084*** (6.52)	0.077*** (6.14)
Leverage			0.995*** (3.09)	0.992*** (3.1)	0.967*** (3.26)	0.918*** (3.08)
beta				0.2*** (2.83)	0.201*** (2.84)	0.195*** (2.72)
Tangibility(t-1)					0.089 (0.34)	0.046 (0.18)
Wage/employees						0.196*** (4.49)
Adjusted R-square	0.135	0.156	0.174	0.177	0.177	0.19
Number of Clusters	1152	1152	1152	1152	1152	1152
Number of Observations	4185	4185	4185	4185	4185	4185

CURRICULUM VITAE

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