# Institutions and Capital Structure: The Case of Chinese Property Firms

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**Abstract:** Different institutional features have been found to affect capital structure decisions, but their connections to corporate finance theories are not always clear. This study aims to assess the predictive power of the agency and pecking order theories in two distinct information environments. The strategy is to compare two similar groups of property firms listed separately on the Mainland and Hong Kong stock exchanges. Both groups operate in the Mainland property market and are subject to the same tax code, but the degrees of transparency and integrity of the stock markets are weaker for the Mainland-listed firms. We find that factors related to agency conflicts and information asymmetries exert a stronger influence on the capital structure decisions of Mainland-listed firms than on those of the Hong Kong-listed firms. This is confirmed by a test of the agency theory using such corporate governance factors as managerial shareholding and shareholding concentration and by a test of the pecking order theory using an error correction model. A further test on the increments of R-squared in the regression models shows that variables derived from the two theories better explain the variations of the capital structure of Mainland-listed firms than those of Hong Kong-listed firms.

**Keywords**: institutions, capital structure, agency problems, information asymmetries

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Modern corporate finance theory began with the Modigliani-Miller (MM) irrelevance theorem. Since then, various theories have been put forward to explain financing decisions based on how the real world differs from a perfect one. Despite the enormous amount of literature on this topic, there remains much to explain. As Lemmon, Roberts, and Zender (2008) pointed out in their analysis of capital structures, fixed effects remain significant even after controlling for the conventional determinants derived from theories. This leads one to ask which time-invariant factor could have led to such a highly persistent capital structure. A relatively "fixed" factor this study seeks to explore is the institution, notably the legal regime and information disclosure mechanism.

In the growing body of international studies, there are two approaches to investigating the effects of institutions on corporate finance. The first one focuses on the *direct* effect of institutional factors on the level of capital structure. On top of conventional firm-level determinants, institutional factors such as ownership structure, legal system, and investor protection were found to be additional determinants of financing decisions (Demirguc-Kunt & Maksimovic 1996; Giannetti 2003; Fan, Titman and Twite 2010).

The other approach focuses on the *indirect* effect, in which institutional factors change the sensitivity of capital structures to such firm-level determinants as firm size and profitability. The three major corporate finance theories – tradeoff theory, agency theory, and pecking order theory – are built on the premise of the tax benefit of debt and various market imperfections. These theories should perform better in institutions with, say, heavier tax burdens and severer information problems, which is consistent with Myers' (2003) argument that the impacts of agency conflicts and information asymmetries should be more pronounced in emerging economies. However, few studies have tested this indirect effect, except De Jong, Kabir, and Nguyen (2008) who employed a big sample of firms from 40 countries. In their study, capital structure was first regressed on firm-level determinants for each country, and the resulting coefficients of firm-level determinants were explained by several institutional factors in the second stage regression. Although more developed institutions were expected to mitigate the impacts of firm-level determinants on capital structure, their findings have been mixed. This is probably due to the insufficient

control of unquantifiable institutional factors such as culture (Zheng, Ghoul, Guedhami & Kwok 2012) and industry characteristics (Titman 1984) in the second stage regression. As will be explained later, the strategy of pooling samples from various countries also raises concerns over the comparability of coefficients across the models estimated for different countries.

This study aims to investigate the indirect effect through a better control experiment. The ideal scenario is to compare the financing behaviors of the same company across different institutions, as demonstrated by Busaba, Guo, Sun, and Yu (2014). But to ensure a meaningful sample size, firms from multiple industries have to be involved, which compromises the control of industry effects. We therefore propose a different research design to control unquantifiable institutional factors through careful sample selection. The unique combination of geographical proximity and institutional differences between the stock exchanges of Mainland and Hong Kong offers such a well-controlled case.

The rapid growth of China's economy has stimulated a need for external sources of financing, but the Mainland's relatively closed capital market presents an obstacle for Chinese enterprises and global capital. While its stock exchanges remain an important channel for raising capital from local investors, a substantial number of Mainland companies are listed in Hong Kong to take advantage of its well-established international financial market. It is, therefore, possible to identify two matched groups of Chinese companies that operate in the same underlying industry, but are listed on different stock markets. As we will show, the Hong Kong-listed group is obviously in a more transparent market with more stringent corporate governance. As such, the agency and pecking order theories, which are built on the premises of agency conflicts and information asymmetries, should have different predictive powers over these two groups of companies. Along this line of thinking and given the sharp difference in the information environment between the Mainland and Hong Kong stock markets, the general proposition of this study is that factors related to agency conflicts and information asymmetries exert stronger influences on and can better explain the capital structure variations of Mainland-listed firms than those of Hong Kong-listed firms.

By confining our study to Mainland and Hong Kong, we can control institutional factors such as macroeconomic conditions, industrial structure, culture, etc. This allows us to narrow our focus to agency costs and information asymmetries. The companies we selected conduct their primary business in Mainland (not including Hong Kong) and are only taxed there, so there is no material difference in the tax treatments. We further confine our analysis to companies in a single industry, which facilitates our analysis by controlling corporate control considerations and product market factors. Previous research suggested that firms in different industries differed in their financing decisions (Lang, Ofek & Stulz 1996; Myers 2001; Chen & Strange 2005). Nevertheless, industry features are usually wiped out by industry fixed-effects, which can be uninformative (Ertugrul & Giambona 2011). The ideas that we propose for this single industry study should be easily extended to other industries.

The real estate industry is selected for study mainly for the homogeneity of its products. A valuation of the underlying assets of real estate companies is more consistent across companies compared to a valuation of other industries, especially those with substantial intangible assets. The real estate industry has been the second largest industry in terms of market capitalization among the ten industries in the Hang Seng industry classification.[1] This guarantees that our sample would be big enough for study. Also, the real estate development industry is known for its tendency to be highly leveraged (Allen 1995; Myers 2001). Among the industries presented on the Mainland stock exchanges, real estate companies were the highest leveraged with an average liability ratio of over 50% (Bhabra, Liu, & Tirtiroglu 2008). The capital structure of real estate companies is particularly interesting.

The sample selection gives us two groups of homogenous samples. This makes the coefficients estimated from the two samples as comparable as possible. Such homogeneity also mitigates the potential biases caused by omitted variables, if there were any. After the sample selection, we estimate three models based on the pecking order and agency theories. The first one is a baseline model that

[1] The other comparable industry is telecommunications. Financials were not considered due to their unique accounting standards. Information source: Fact Book 2012 of the Hong Kong Stock Exchange.

involves four determinants – profitability, asset tangibility, firm size, and growth. The second one is an agency model, which augments the baseline model with corporate governance variables to test the predictive power of the agency theory. With the target debt ratio estimated from the baseline and the agency models, the third one is an error correction model to test the predictive power of the pecking order theory. Two sets of statistics are of interest – the coefficients and R-squared. Our results show that all coefficients related to the two theories from the Mainland sample are larger in magnitude than those from the Hong Kong sample. This is consistent with our proposition that leverage is more strongly affected by its determinants in the Mainland, where agency conflicts and information asymmetries are more prevalent. However, this conclusion should be taken with caveat. Regardless of our efforts in selecting homogenous samples, the mean values of certain variables in the two groups are still different. This makes the coefficients estimated from them incomparable. Thus, we further consider the R-squared of the models. Our results show that the Mainland-listed sample always has a higher R-squared. More importantly, the R-squared increments caused by the agency and pecking order variables are also higher for the Mainland sample. Taken together, we show that institutions affect capital structure decisions by influencing the role of other firm-level determinants in the predicted manner.

The rest of the paper is structured as follows. After a brief review of the literature, we will compare the institutional background between capital markets in Mainland and Hong Kong. Empirical strategies and data will be described in Sections 4 and 5. Section 6 discusses the empirical results. Concluding remarks are provided at the end.

## Literature Review

Several capital structure theories have been developed by relaxing the MM irrelevance theorem's perfect market assumptions. Jensen and Meckling (1976) proposed an agency theory that focuses on the tradeoff between agency conflicts of external equity financing and that of debt financing. Debt mitigates shareholder-manager conflicts by forcing managers to pay out cash, but induces shareholder-creditor

conflicts like asset substitution (Jensen and Meckling 1976) and underinvestment (Myers 1977). Myers (1984) and Myers and Majluf (1984) put forward a pecking order theory in which asymmetric information between firms and investors makes internal financing and debt more appealing than equity issues. Under information asymmetries, the costs of issuing risky securities incurred by management's superior information on the firms' securities form a pecking order. Consequently, firms prefer internal financing over debt and debt over external equity financing. Built on the basic assumptions of agency conflicts and information asymmetries, the theories imply important roles of institutions in corporate financing.

As mentioned, two types of effect of institutions on capital structure have been investigated. The first one is their direct effect on capital structure. Empirically, capital structure is explained by quantified institutional factors in addition to firm-level determinants, with samples from various countries pooled together. Demirguc-Kunt and Maksimovic (1996) found that the initial development of a stock market is associated with a higher debt-equity ratio, while further development reduces it. Giannetti (2003) suggested that institutions with better creditor rights protection are associated with both higher leverage and more long-term debt. Fan, Titman, and Twite (2010) found leverage to be positively related to corruption, explicit bankruptcy code, and the tax benefit of debt, and negatively related to the strength of legal protection for financial claimants and the development government bond market.

Another type is the indirect effect of institutions. This line of reasoning started by asking if corporate finance theories work equally well in different institutions. A large body of empirical studies has tested the theories under different institutional environments, covering both developed and developing countries (Rajan & Zingles 1995, Wald 1999; Booth, Aivazian, Demirguc-Kunt & Maksimovic 2001; Deesomsak, Paudyal & Pescetto 2004; Delcoure 2007). Their conclusions are similar. Firm-level determinants of capital structure identified in the U.S. are also important predictors in other countries. However, the literature also unanimously agrees that there are substantial variations in capital structure's sensitivity to these determinants across countries, implying an indirect effect of institutions on capital

structure. These variations in sensitivity cannot be easily explained by institutional factors such as tax codes, bankruptcy laws, financial system structures, etc.

Further tests of the indirect effects are scarce. Prowse (1990) compared American and Japanese firms and found that under the stronger governance of institutional investors, the effects of other firm-level governance mechanisms are weakened. Giannetti (2003) found that firms rely less on tangible assets when creditors are better protected. De Jong, Kabir, and Nguyen (2008) offered the most rigorous strategy to examine the indirect effects with samples from 42 countries. Capital structure was repeatedly regressed on a series of firm-level determinants such as profitability, firm size, and asset tangibility for each country. The coefficients of firm-level determinants derived from step one were then regressed on country-level institutional factors. The researchers found that institutional factors like financial claimants protection, law enforcement, and stock market development can partially explain the cross-country variations in the coefficients. They hypothesized that the impacts of bankruptcy costs, agency costs, and pecking order financing are mitigated in more developed institutions. However, their findings contained inconsistencies. For example, while Japan arguably has better creditor protection than most developing countries, tangible assets play a more important role there than in about 90% of the countries in their sample. Two problems in the empirical strategy are responsible for such inconsistencies.

The first is a lack of control. The abovementioned puzzle could simply be due to Japan's strongly bank-oriented financial system. An institution is a big concept. The effects of the various institutional factors supplement each other in some cases, but offset each other in others. Institutional factors such as culture (Zheng, Ghoul, Guedhami & Kwok 2012) and political risk (Cashman, Harrison & Seiler 2013) have been found to be important in corporate financing decision, but they were rarely controlled in empirical studies. To tackle this control problem, we carefully confine our sample to a single industry, but one that are listed on different stock markets. As such, all institutional factors not directly related to the stock exchanges are well-controlled. This narrows down the focus to information asymmetries and agency conflicts.

The second problem in the empirical strategies that examine the indirect effects of institutions lies in the comparability of the coefficients across institutions. Firms in different countries and industries are heterogeneous, so the mean values of firm-level determinants are likely to be significantly different across countries and industries. This invalidates a comparison of the coefficients estimated from different samples, especially when the non-linear effects of determinants are ignored. The variation in coefficients may simply be due to the different distributions of variables across samples rather than to the work of institutions. While linear models are typical in empirical corporate finance literature, non-linear relations are believed to be common (Fattouh, Harris, & Scaramozzino 2008). We tackle this problem by selecting two homogenous groups of firms. As will be seen in the Data section, the key variables of the tests of the pecking order theory have similar mean values. However, despite our efforts, the corporate governance variables of interest in the two groups still have significantly different mean values. Hence, we further test our proposition by examining the increments of R-squared.

Besides a methodological contribution, this study also proposes a clearer framework to systematically connect institutions to the predictive power of capital structure theories. Conventional firm characteristics such as firm size and profitability have been the focus of most of the literature on the indirect effects of institutions. But alternative capital structure theories yield predictions for every such determinant. It is, thus, difficult to understand the underlying force driving the sensitivity variations across institutions. In this study, such conventional determinants only serve as a control. The agency and pecking order theories are examined separately, which enables us to draw independent conclusions on the two theories.

## Institutional Background

Mainland China and Hong Kong differ in their financial and legal systems. Hong Kong, as an international financial center, is known for its mature and well-developed banking sector and stock

market. In contrast, Mainland's financial system is still developing. Despite the rapid growth of its stock market, Mainland's banking sector remains the predominant source of finance. In 2011, funds raised by equity were RMB581 trillion, which were much smaller than the amount of the loans issued by financial institutions (RMB54,795 trillion).[2] Above all, the small amount of resources allocated through public financing channels restricts the stock market's role in generating and disseminating information. In some cases, related information is deliberately not disclosed as a strategic measure by the government (Allen, Qian, & Qian. 2005).

Table 1 lists the major differences in information disclosure regulations between the Mainland and Hong Kong stock exchanges. Hong Kong has more stringent rules and enforcement. In Mainland, despite the government's efforts to tighten regulations, its information disclosure practices remain a major concern. Accounting manipulation appears to become even easier in the process of integrating China's accounting standards with the International Accounting Standards, mainly due to the lack of enforcement of the new standards, as well as the underperformance of the Mainland's judicial system (Allen et al. 2005). Frequent cases of accounting fraud by Chinese firms have put major auditing companies on alert and concerned prospective investors, as reported by Reuters and Bloomberg.[3] As a whole, Hong Kong's stock market is much more transparent than Mainland's.

*Insert Table 1 here*

Other than information disclosure, the two stock exchanges are separately regulated. The Hong Kong Stock Exchange is a comparatively open and free market without special restrictions on transactions and capital flows, while there are "untradeable" shares on the Mainland stock markets, which stemmed from state ownership in the planned economy age. Officially, untradeable shares could only be

[2] Source: China Statistic Yearbook 2012.
[3] http://www.reuters.com/article/2011/06/24/us-china-accounting-idUSTRE75N19J20110624. http://www.bloomberg.com/news/2014-03-23/trust-default-protesters-recall-zero-risk-pledges-china-credit.html.

transferred privately with the approval of the China Securities Regulatory Commission (CSRC). In 2005, the Chinese Government initiated the split-share structure reform that aimed to eliminate untradeable shares,[4] but shares with trading restrictions stemming from untradeable shares remain common and have led to several corporate governance problems. First, the average transaction price of untradeable shares is much lower than that of common shares (Chen & Xiong 2001), but they are entitled to the same cash flow and voting rights. Second, shareholders of tradeable shares are mostly in the minority and do not have enough power to affect the decisions of their boards. Thus, they are more vulnerable to expropriation. Third, the illiquidity of untradeable shares intensifies the volatility of the market and facilitates its manipulation.

Other aspects of corporate governance in Mainland also fall behind those of Hong Kong. Despite the split-share structure reform and the state's subsequent retreat from the business sector in Mainland, state ownership still enjoys a strong presence today. The Chinese Government is both the market regulator and major shareholder of state-owned enterprises (SOEs). Conflicting interests between its two roles have led to inefficiency in achieving maximum profits (Allen et al. 2005). As will be shown in the Data section, SOEs prefer to go public on the Mainland stock exchanges. Their capital structure decisions are more vulnerable to agency problems. Beyond the state-owned sector, the effectiveness of market governance is also questionable. Due to the prevalent cross-holdings of shares among publicly traded firms, the threat of a hostile takeover is rare in Mainland. While institutional investors are a major external governing mechanism in developed economies, they are still a novelty in Mainland and do not exert a strong influence (Bhabra et al. 2008). The legal system in Mainland is culpable for these situations.

Several legal system-related corporate governance indicators from previous empirical studies are tabulated in Table 2. A comparison of the laws of both places shows that Hong Kong provides a more

[4] Right after a company is reformed, its reformed untradeable shares cannot be transacted for the first 12 months. Shareholders holding more than 5% of the reformed untradeable shares can sell no more than 5% of them in the second 12 months and 10% in the third 12 months.

stringent corporate governance environment by any standard.

*Insert Table 2 here*

## Methodology

The Literature Review showed that institutions are important determinants of capital structure. Both theoretically and empirically, corporate governance and information environment are crucial in financing decisions. The previous section demonstrated that Mainland China's information environment is less transparent and corporate governance less stringent than Hong Kong's. In other words, the underlying drivers of the agency and pecking order theories are stronger in Mainland. Therefore, our general proposition is that factors related to agency conflicts and information asymmetries exert stronger influences on and can better explain the capital structure decisions of Mainland-listed firms than those of the Hong Kong-listed firms. Based on this proposition, we conduct two sets of empirical tests on the coefficients and R-squared of the models estimated from Mainland-listed and Hong Kong-listed samples, respectively. More specific hypotheses will be made when the models and variables are introduced.

### Baseline model

To test the proposition, we start with a baseline model. In previous empirical research, four determinants of debt ratio are typically used: profitability, asset tangibility, firm size, and the market-to-book ratio. Using an extensive sample of American firms from 1950-2003, Frank and Goyal (2009) found that these four are the most reliable among a long list of firm-specific determinants.[5] The baseline models – one for Mainland and the other for Hong Kong – are thus formulated as:

[5] In addition to the four baseline determinants identified by Frank and Goyal (2009), we also tried alternative determinants including property development business involvement, the geographical distribution of businesses, interest payments, non-debt tax shields, etc. But they were dropped due to insignificant coefficients in the models estimated from both samples. With two homogenous samples, even if there were still omitted variables, the omission should only have very limited effects on the estimation of our models.

$$DR = \beta_{0,i} + \beta_{1,i}PROF + \beta_{2,i}TANG + \beta_{3,i}SIZE + \beta_{4,i}MTB + \varepsilon \quad (1)^{6}$$

where $i = ml$ for Mainland-listed firms and $i = hk$ for Hong Kong-listed firms. *DR* is the ratio of the debt to total assets. The independent variables are profitability (PROF = EBIT divided by the book value of the total assets), asset tangibility (TANG = tangible assets divided by the book value of the total assets), firm size (SIZE = the natural logarithm of the book value of the total assets), and growth (MTB = the market-to-book ratio).

According to the pecking order theory, firms prefer internal financing over debt. Profitable firms (PROF) have less need for external debt financing, thereby decreasing their debt ratio. However, profits also generate free cash flow that induces shareholder-management conflict. Profitable companies need more debt to monitor their managers. The tradeoff theory also predicts positive effects because higher profitability reduces bankruptcy risk. Although theoretical prediction is obscure, empirical evidence on profitability always supports the pecking order theory. Since Mainland's information environment is less transparent, the magnitude of the pecking order effects there should be stronger: $\beta_{1,ml} < \beta_{1,hk} < 0$ (Hypothesis 1.1, or H1.1).

Tangible assets (TANG) directly improve borrowing capacity by providing access to secured debt with collateral. The liquidated value of tangible assets reduces the potential costs of bankruptcy, so a higher debt ratio results. It is predicted that $\beta_{2,ml} > 0$ and $\beta_{2,hk} > 0$ (H1.2). The tangible assets of both groups of firms are located in Mainland. For the Hong Kong-listed groups, these assets are mostly held by their Mainland-registered subsidiaries. Moreover, the major creditors of both Mainland and Hong Kong-listed companies are Mainland banks. As such, the bankruptcy procedures of both groups are basically regulated by the same law and enforcement. We do not expect a significant difference between the coefficients of TANG estimated from the two sample groups.

[6] For simplicity's sake, all subscripts denoting firms and time were omitted from this and later equations.

Bigger firms (SIZE) are less likely to go bankrupt and the tradeoff consideration increases the optimal debt ratio. Earnings volatility decreases with an increase in firm size, which reduces asset substitution and underinvestment risks for creditors (Myers, 1977). This allows firms to borrow more. Given that the agency costs are higher in the Mainland, this prediction from the agency theory should be stronger in Mainland sample. Consistent with previous empirical studies, a positive effect is predicted, and the effect should be larger in Mainland: $\beta_{3,ml} > \beta_{3,hk} > 0$ (H1.3).

The market-to-book ratio (MTB) measures future growth opportunities. In the agency theory, growth opportunities facilitate both under-investment and asset substitution, thereby reducing debt. The complex version of the pecking order model emphasizes retaining borrowing capacity for future investment opportunities. Growing firms tend to keep current debt ratio low. Whether this applies to market or book debt ratio depends on whether creditors care about the market or book total assets in determining borrowing capacity. If book value is the consideration, market debt ratio also decreases with the market-to-book ratio, given that future investment opportunities increase market value. But if market value matters, there is no prediction for book debt ratio (Fama & French 2002). Regarding the tradeoff consideration, the value of growth options diminishes upon bankruptcy. Growing firms bear larger potential bankruptcy costs, which lower optimal debt ratio. So when the market debt ratio is the dependent variable, we expect a negative coefficient, with the Mainland's one being more negative: $\beta_{4,ml} < \beta_{4,hk} < 0$. The pecking order theory clouds the prediction for book debt ratio, but considering the agency and tradeoff predictions, we also predict for book debt ratio that $\beta_{4,ml} < \beta_{4,hk} < 0$ (H1.4).

As discussed, more than one theories generate predictions for each of these conventional determinants of capital structure. It is hard to conclude which theory is underlying the expected observations. Rather than focusing on these variables, as previous international studies did, we only lay out the baseline model as a first step towards more specific tests of our proposition.

## Debt and corporate governance

To further test the proposition, we add several firm-level corporate governance factors to the baseline model, as Equation (2) shows.

$$DR = \beta_{0,i} + \beta_{1,i}PROF + \beta_{2,i}TANG + \beta_{3,i}SIZE + \beta_{4,i}MTB + \beta_{5,i}MASH + \beta_{6,i}TSH + \beta_{7,i}TSH \times MASH + \varepsilon \quad (2)$$

Managerial shareholding (MASH) aligns managers' interests with shareholders' and mitigates agency conflicts (Jensen & Meckling 1976; Berger, Ofek, & Yermack 1997). Thus, less debt is needed for monitoring purposes. In an underdeveloped corporate governance system, investors of Mainland-listed firms are insufficiently protected by the law. They should be keener to the monitoring by debt as the managerial shareholding decreases. Thus, the substitutive relationship between debt and managerial shareholding should be stronger, and expectedly, $\beta_{5,ml} < \beta_{5,hk} < 0$ (H2.1).

In firms with concentrated holdings, top shareholders (TSH) bear most of the costs of managerial discretion, so they have the incentive and power to monitor their managers. Hence, they play a similar role to debt. As a substitute for debt, concentrated ownership should be negatively related to the debt ratio (Ang, Cole, & Lin 2000). Similarly with MASH and debt, the substitutive effects between TSH and debt should be stronger for Mainland-listed firms. It is expected that: $\beta_{6,ml} < \beta_{6,hk} < 0$ (H2.2).

Since managerial shareholding and top shareholders can both monitor debt, they can substitute for each other. When managerial shareholding is so high that agency costs are already mitigated, the marginal effects of shareholding concentration in decreasing agency costs should be smaller than when managerial shareholding is low and vice versa. In extreme cases, when top shareholders and managers are one and the same, no agency problem exists between managers and top shareholders and no monitoring by top shareholders can be observed. As such, we also include an interaction term,

TSH×MASH, in the equation and expect it to offset the separate effects of MASH and TSH. Given that their separate effects are weaker in Hong Kong, the offsetting effects should accordingly be weaker. Hence, it is predicted that: $\beta_{7,ml} > \beta_{7,hk} > 0$ (H2.3).

As the Data section will show, the mean values of MASH and TSH are significantly different between the Mainland and Hong Kong-listed samples. This should not be a concern if the relationship between the dependent and independent variables are accurately modelled. However, if there are non-linear effects that are not perfectly modelled, the coefficients estimated from the two samples would be incomparable. Misspecification may occasionally incur empirical findings consistent with our hypotheses.

Therefore, apart from the tests on the coefficients, we further evaluate the change in R-squared from Equation (1) to (2). Any deviation from the financing decisions predicted by the agency theory would incur higher costs in Mainland due to severe agency conflicts. As such, the agency theory should be able to explain more variations in the capital structure of Mainland-listed firms. We predict that the R-squared of Equation (2) estimated from the Mainland-listed group is higher than that from the Hong Kong-listed one (H2.4). More specifically, concerning the agency theory, the R-squared should increase more in the Mainland model when the corporate governance variables are added to the baseline models (H2.5). This difference-in-difference comparison in testing H2.5 will provide a strong test of our proposition.

## Debt and information environment

Our strategy of testing the role of the information environment in capital structure decisions is to estimate an error correction model (or a partial mean-reverting model) in the spirit of Fama and French (2002) and Shyam-Sunder and Myers (1999). Both the agency and tradeoff theories predict the existence of a target debt ratio. In the pecking order theory, companies exhaust internal resources first and then turn to the safest form of external financing – debt. The debt ratio is determined by the amount of money

needed for investment and the availability of internal financing. There is no target debt ratio in the pecking order world. The model nests the tradeoff effects with the pecking order effects. The fitted values of the debt ratio from Equation (1) or (2) are used as the long-term target debt ratio (TDR). Tradeoff effects, if any, are absorbed by the mean-reverting component of Equation (3). $\alpha$ gives the speed of the mean-reverting effects. The pecking order factors should explain the short-term deviation from the target debt ratio.

$$\Delta DR_t = \beta_0 + \alpha_i \times (TDR_{t-1} - DR_{t-1}) + \beta_{8,i} \times \Delta BTA_t + \beta_{9,i} \times PROF_t + \varepsilon_t \qquad (3)$$

The lagged target debt ratio is used for two reasons. First, the predetermined determinants of the target debt ratio help mitigate the potential endogeneity problem. Second, for determinants in Equations (1) and (2) that change at a high frequency, such as profitability, the exact values are not even known to managers until the end of the year. But financial decisions are made during the year. Thus, managers are assumed to adjust the debt ratio according to the deviation from the previous year's target.

The tradeoff and agency theories predict $\alpha$ to be significantly positive and smaller than unity. The coefficients of the pecking order factors ($\beta_8$ and $\beta_9$) are of particularly interest. Increases in ΔBTA indicate realized investments in the current year. Keeping internal cash constant, the amount of debt should increase correspondingly. Profit reduces the need for external debt financing. Mainland-listed firms face stronger information asymmetries, so they should conform more to the financing hierarchy. This leads to the following predictions: $\beta_{8,ml} > \beta_{8,hk} > 0$ (H3.1) and $\beta_{9,ml} < \beta_{9,hk} < 0$ (H3.2).

Similar to the tests of the agency theory, we also consider the R-squared. The R-squared for the entire equation is expected to be higher for the Mainland-listed sample (H3.3), as the agency theory predicts mean-reverting effects and the pecking order theory generates predictions for $\beta_8$ and $\beta_9$. In addition, by adding the two pecking order variables ($\Delta BTA_t$ *and* $PROF_t$) to the rest of the equation, the R-squared increment should also be higher for the Mainland-listed companies (H3.4).

Equations (1) to (3) are estimated by the OLS technique. Each model are estimated separately with the Mainland-listed and Hong Kong-listed samples. Aggregated equations are also estimated with the two groups of companies pooled together. The aggregated equations include a standalone term and an interaction term with the Mainland-listed dummy for all independent variables and the constant. The interaction terms give the differences between the separately estimated coefficients of the Mainland and Hong Kong-listed firms. Year fixed effects are applied, but cross-section fixed effects are not because the ownership structures and top manager features are very stable across the years. Cross-section dummies would make them insignificant.

## Data

We construct the sample through several filters: 1) over 50% of revenues must come from property business; 2) at least 90% of revenues must be generated in Mainland; 3) firms listed on more than one stock exchanges are excluded; and 4) firms listed in Hong Kong with unlisted domestic shares (e.g. the three H-share companies) are excluded. The resulting sample consists of 107 Mainland-listed firms and 72 Hong Kong-listed firms for 2006-2011.[7]

Accounting data are collected from various sources, including the Bloomberg Financial Database and WIND Financial Terminal. The latter provides detailed accounting information on firms listed on both the Mainland and Hong Kong exchanges. More specific information, mainly ownership structure and top management characteristics, is manually collected from the firms' annual financial statements, which are extracted from the exchanges' official websites. All amounts are denominated in RMB.

[7] There were two rounds of credit-tightening policies in China during the sample period. One came in 2008 and the other in 2011. In the first case, the policies occurred during the first half of 2008, but were reversed during the second half due to the global financial crisis. So, our annual data may be unable to capture the effects of the policies. The last year of our sample period was 2011, so the second round of credit-tightening did not matter much.

*Insert Figure 1 here*

*Insert Table 3 here*

Table 3 shows the descriptive statistics. The last column gives the t-statistics of equality tests of the mean values. As also shown in Figure 1, Mainland-listed firms have slightly higher book debt ratios (BDR), but Hong Kong-listed firms have significantly higher market debt ratios (MDR). Two measurement biases are responsible for the remarkable difference between the book and market debt ratios. First, Hong Kong-listed firms use a fair value approach to evaluate investment property – a significant component of tangible book assets. The big rise in property prices during the sample period is reflected in the book assets of Hong Kong-listed firms. As for the Mainland-listed firms, book assets are historical costs that are underestimated during the rising property market,[8] which causes their book debt ratios to be overestimated. Second, market firm values in Mainland are overestimated due to untradeable shares, leading to an underestimation of their market debt ratios. The MTB further demonstrates these biases. While the average MTB is close to 1 for Hong Kong-listed firms, it is over 3 for the Mainland-listed ones. Discounting the value of untradeable shares by 80% in the tradition of Chen and Xiong (2001) reduces the gap by little. The true debt ratios of the Mainland-listed firms should be between the BDR and MDR. As mentioned in the Methodology section, both measurements of the debt ratio will be used.

As for other explanatory variables, Mainland-listed firms seem smaller (SIZE) and have higher MTB ratios. Notably, the two key variables for testing the effects of agency conflicts have significantly different mean values. Hong Kong-listed firms have more concentrated ownership (TSH) and higher managerial shareholdings (MASH). As elaborated in the Methodology section, this can make the coefficients estimated from both groups incomparable, which necessitated further tests. Hence, we consider R-squared. State-owned enterprises (SOE = 1) prefer Mainland exchanges. The potential

[8] In both Mainland and Hong Kong, public companies can choose either the cost or fair value approach to measure investment property. In Hong Kong, the fair value approach is unanimously practiced, while in Mainland, the cost approach prevails in practice. Only 7 Mainland-listed samples with 24 observations applied the fair value approach.

effects of this preference will be dealt with in the Robustness section.

Different accounting practices between Mainland and Hong Kong bring about one more concern. The China Accounting Standards for Business Enterprises (CASBE) merged with the International Financial Reporting Standards (IFRS) in 2007. Since this study only uses accounting data publicized in or after 2007, the effects of the accounting standards should be limited. Even so, the remaining difference is still a limitation. Cost valuation in Mainland underestimates firm size, which is an alternative explanation for the expected larger SIZE coefficient in the Mainland-listed firms. The market value of the total assets could be an alternative measurement of firm size. But due to the bias in measuring the market value of untradeable shares, market firm size is overestimated in Mainland. As for tangibility, the accurately measured fair value of the tangible assets is also unavailable. Considering that the two variables are mainly involved in the baseline model, the estimations of Equations (2) and (3) are less affected. The conclusions from Equations (2) and (3) should still hold despite the data limitations.

Table 4 shows the pairwise correlations. The upper triangle is for the Hong Kong-listed firms and the lower one for the Mainland-listed firms. Regardless of the possible biases in measuring the debt ratio, BDR and MDR are highly correlated, suggesting that the biases in equity value are relatively small or fixed over time. Either way, they should have hardly affected the regressions. Generally, the correlations among the independent variables are low. Multicollinearity should not be a concern.

*Insert Table 4 here*

# Results

## Baseline model

The results of the baseline models are shown in Table 5. The left panel of the table gives the

estimations with BDR as the dependent variable. The results for the Mainland and Hong Kong-listed firms are displayed in columns named ML and HK, respectively. The Dif. column gives the significance tests of the differences between the coefficients of the two firm groups.

PROF is negatively associated with the debt ratio, but the difference between the Mainland and Hong Kong coefficients is insignificant. This is probably due to the vague theoretical prediction of the coefficient signs. Firms with a higher TANG and SIZE incur more debt. The TANG coefficients are only insignificantly different between the two groups. The SIZE coefficient estimated from the Mainland-listed sample is significantly larger than that from the Hong Kong-listed one, as expected. Given that the tradeoff effects are well-controlled, this difference supports the proposition that the predictive power of the agency theory is stronger in Mainland, where agency conflicts are a bigger concern.

Despite the ambiguity of the predictions, MTB is, as with most previous empirical studies, negatively related to BDR for the Mainland-listed companies. This is consistent with the prediction of the complex version of the pecking order theory, which states that growing firms tend to retain borrowing capacity for the future. The corresponding coefficient for the Hong Kong-listed group is positive, but insignificant. The borrowing capacities of the Hong Kong-listed firms might depend more on the market value of their assets. Another possibility is that the Hong Kong-listed firms are more robust than their Mainland peers due to self-selection (Wong, Wei, and Chau. 2013) and the CSRC's selection of leading firms to launch IPOs in Hong Kong in early years. Creditors appreciate future growth opportunities for good quality firms with fewer agency concerns.

*Insert Table 5 here*

The results of the equations with MDR as the dependent variable (the right panel of Table 5) are

basically consistent with the book debt ratio equations, with one exception. The Hong Kong coefficient of MTB become negative and significant and it is larger in magnitude than the Mainland ONE. This might have been caused by the way the market debt ratio and the market-to-book ratio are calculated rather than by the work of any corporate finance theory.

The last two rows of Table 5 give the Wald test results of the joint significance of the differences between the Mainland and Hong Kong coefficients: the former are jointly different from the latter. Taken together, the baseline models provide evidence to support the proposition that the identified factors exert a stronger influence on the debt ratio decisions of the Mainland-listed firms. But such evidence is insufficient given that the predictions of alternative theories are intertwined and the hypotheses are not always clear. More tests specifically related to the agency conflicts and information environments follow.

## Debt and corporate governance

Managerial shareholding and shareholding concentration are used to test the impacts of corporate governance environments on capital structure decisions. Their results are in Table 6. The coefficients of the four variables in the baseline model are stable, confirming their decisive roles. As expected, MASH coefficients for both Mainland-listed and Hong Kong-listed firms are negatively associated with debt ratio, but only the Mainland coefficient is significant. TSH has the expected negative coefficient only for the Mainland-listed group. We continue our test with an intersection term of shareholding concentration and managerial shareholding (TSH×MASH) to examine the offsetting effect. We consistently come up with positive coefficients of the interacted terms, indicating that when managers and top shareholders hold a higher portion of shares, their monitoring effects offset each other.

*Insert Table 6 here*

As shown in the Dif. Column on the left of Table 6, the coefficients of all the corporate governance terms of the Mainland-listed firms are larger in magnitude and significant except for MASH. The prediction that agency conflict factors are more influential on the Mainland-listed firms than on their Hong Kong-listed counterparts is basically confirmed.

The right panel of Table 6 shows the results of the models with the market debt ratio as dependent variables. The four baseline variables perform consistently with the baseline estimations. All corporate governance variables are also consistent with the book debt ratio equations.

The constants of the equations capture the remaining differences in the debt ratios of Mainland and Hong Kong-listed firms that are not controlled by the independent variables. Table 6 shows that corporate governance controlled, Mainland-listed companies have a higher book debt ratio, but lower market debt ratio. As discussed in the Data section, two measurement biases are responsible for this. The historical cost valuation approach in Mainland overestimates the book debt ratio. The untradeable shares induce an underestimation of the market debt ratio. Since the valuation approach of the Mainland-listed firms is consistent over the sample period and across firms, its effects should be captured by the constants. The coefficients, as the major concern over testing the hypotheses, are determined by the variations in the variables, so they should not be affected substantially by the valuation bias.

*Insert Table 7 here*

The R-squared, as tabulated in Panel A, Table 7, provides additional support for our proposition. As expected, the estimations of Equation (2) for the Mainland-listed companies have higher R-squared than their Hong Kong-listed counterparts. But the higher R-squared could be due to the effects of the baseline or corporate governance variables. Therefore, we further examine the increments of R-squared by adding the corporate governance variables to the baseline models. The corporate governance variables

increase the R-squared of all models. Consistent with our hypothesis, the R-squared increments of the BDR and MDR models are higher for the Mainland-listed group. The variables derived from the agency theory have stronger explanatory powers in Mainland, where agency conflicts are a bigger concern.

In summary, the agency theory explains the financial decisions of Chinese property firms. The evidence found for the Mainland-listed firms confirms this, but there are unexpected coefficients in the Hong Kong models. The comparisons of R-squared show that the corporate governance variables can explain more variations in the capital structure in the Mainland than in Hong Kong. The agency theory can better explain the capital structure of the Mainland-listed companies.

## Debt and information environment

An error correction model is estimated to test the simple version of the pecking order theory. The target debt ratio (TBDR or TMDR) is fitted with the values of Equation (1) or (2). Panel A of Table 8 shows the results with the annual changes of the book debt ratio as the dependent variables, while Panel B is for the market debt ratio estimations. The left and right parts of Table 8 show the results with the target debt ratio estimated from Equations (1) and (2), respectively. As the aforementioned different valuation approaches of assets in Mainland and Hong Kong are consistent over time, the measurement bias should not be reflected in the dependent variables. The target debt ratios are separately estimated for the Mainland and Hong Kong-listed firms. Therefore, the measurements of the tradeoff components are not biased by the valuation approaches either. The same argument applies to the pecking order components. The following findings are robust in spite of potential measurement bias.

The coefficients of the deviation from the target debt ratio ($DR_{t-1}$-$TDR_{t-1}$) are constantly negative, showing that the debt ratio mean-reverts to the predetermined target. But the small coefficients (0.255 ~ 0.357) indicate slow adjusting speeds. Models on the right side of Table 8 have faster adjusting speeds, probably due to the more accurate target debt ratio estimated with the additional corporate governance

variables.

PROF and ΔBTA are the variables of interest for testing H3.1 and H3.2. The pecking order theory states that under information asymmetries, internal financing is the most appealing, followed by debt financing follows. Thus, the debt ratio should decrease with the increased availability of internal financing from profits. As it turns out, the PROF coefficients are consistently negative for the Mainland-listed companies. They are also negative and significant for the Hong Kong-listed group in Panel A, but turn insignificant when annual changes of market debt ratio is the dependent variable. The Mainland coefficients are always larger than their Hong Kong counterparts with significant differences in all models. External equity financing is the last resort in the simple version of the pecking order theory. Given the amount of internal funds available, increases in the total assets should be mainly financed by external borrowing. The corresponding coefficients are all significant and positive. Again, the magnitudes of the Mainland coefficients are consistently larger than those of their Hong Kong counterparts.

*Insert Table 8 here*

Panel B of Table 7 shows the R-squared of the error-correction models. The R-squared of Equation (3) is higher for the market debt ratio equations. It is likely that market value responses to changes more swiftly than the book value. The Mainland equations have higher R-squared, as expected. The error-correction model explains the capital structure of the Mainland-listed firms better. The "error-correction component" rows give the R-squared of Equation (3) without the two pecking order variables. The higher R-squared for the Mainland-listed firms indicates that they adjust the capital structure more consistently toward the target. With the tradeoff effects controlled, the results imply the stronger explanatory power of the agency theory in Mainland. Most importantly, the two pecking order variables induce greater increments of R-squared for the Mainland-listed sample in both BDR and MDR models.

As expected, the pecking order theory explain the capital structure of the Mainland-listed firms better than that of the Hong Kong-listed firms.

In conclusion, the mean-reverting effects are significant, but with slow speed in both groups, which is consistent with previous empirical findings on Chinese firms. The pecking order theory works well in both groups, but the Mainland-listed firms follow the pecking order more closely.

## Robustness

Table 9's robustness check deals with untradeable shares, which are prevalent in the Mainland-listed enterprises. Even though the share structure reform nominally eliminated untradeable shares, shares with trading restrictions stemming from untradeable shares (also referred to as untradeable shares for simplicity) still enjoy a strong presence with an average level of 39.2% in the Mainland-listed companies in our sample. In the previous tests, the untradeable and common shares are treated equally. But the illiquidity of the former leads to value discounts. Chen and Xiong (2001) suggested that the value of untradeable shares is about 80% of that of tradeable shares with the same cash flow and voting rights. This measurement bias overestimates the market value of Mainland-listed companies. We adjust by calculating the alternative market debt ratio (MDR8) and market-to-book ratio (MTB8) with the untradeable shares discounted by 80%. After that, we re-estimate all the relevant equations. As Table 9 shows, the results are consistent with the previous findings. Particularly, as Panel A shows, the difference between the MASH coefficients of Mainland and Hong Kong become significant. This further confirms our hypotheses.

*Insert Table 9 here*

These tests only show the direction of the impacts caused by the measurement bias, rather than

perfectly correct for it. As mentioned in the Data section, with the untradeable shares discounted by 80%, the average MTB is still substantially higher in the Mainland-listed group. Further research with more accurate estimations is needed to determine the magnitude of the value discount of the untradeable shares.

The second robustness check concerns the effects of state ownership. First, SOEs have better access to bank loans in Mainland (Dewenter & Malatesta 2001; Li et al. 2009). Second, by definition, the largest shareholder of an SOE is the state. Due to the government's difficulty in effectively managing every company under its nominal control, agency conflicts are often aggravated. Therefore, SOEs may behave differently in their financial decisions. As Table 3 shows, they tend to prefer Mainland stock exchanges. As a robustness check, we drop SOEs from our sample and repeat all the empirical analyses. The results are tabulated in Table 10. Our findings basically remain the same. Notably, the difference between the MASH coefficients for Mainland and Hong Kong become significant after dropping the SOEs. The insignificance of the difference between Mainland and Hong Kong's MASH coefficients in the full sample is probably due to SOEs.

Unexpectedly, in the tests of the pecking order effects, the difference between the $\Delta BTA_t$ coefficients of the Mainland and Hong Kong-listed groups turns insignificant in the MDR models, although the remains expected. This is probably due to the fact that firm growth measured by $\Delta BTA_t$ increases market value and hence decreases with the market book ratio. The complex pecking order theory states that fast-growing firms suffer less from information asymmetry. Non-SOEs are generally smaller firms for which growth opportunities are highly valued. Therefore, the relationship between market value and $\Delta BTA_t$ obscures the expectation, especially for non-SOEs.

*Insert Table 10 here*

The third robustness check deals with potential selection bias. Wong et al. (2013) examined

Chinese developers' choices of IPO location and found that those with better unobserved quality are more likely to list in Hong Kong. Furthermore, as discussed, state ownership is clearly associated with the choice of listing location. Therefore, spliting the sample into Mainland and Hong Kong-listed companies and testing them separately induces potential selection bias. The differences between the capital structure decisions of these two groups could be due to their unobserved quality or state ownership, rather than to information environment or agency considerations. We employ the Heckman two-stage procedure to control for selection bias. During the first stage, the decisions to list in the Mainland or Hong Kong are estimated with a probit model. The determinants of listing location include a firm's unobservable quality, an SOE dummy, and other firm characteristics such as profit, firm size, and growth. Following Wong et al. (2013), unobserved firm quality is measured by the conventional abnormal return factor, Jensen's α.[9] It is estimated as the constant of a capital asset pricing model in which a firm's stock returns are regressed on the market portfolio returns (the Hang Seng Index or the Composite Indices of A shares). Other variables, such as profitability, firm size, and growth, were important considerations for the CSRC when it came to selecting firms for going public in Hong Kong during the early years (Zhang, 2008). The results of the probit model are in Panel A of Table 11. Except for profitability, all other variables are significant. Consistent with Wong et al. (2013), firms with better unobservable quality tend to list in Hong Kong. The inverse mills ratio, derived from the first-stage probit model, is then controlled in the models testing the agency and pecking order theories. Panel B displays the results of the tests of the agency theory. The coefficients of corporate governance variables are all consistent with those from the previous tests. Panel C gives the results of the tests of the pecking order effects. The inverse mills ratio is insignificant in most of the equations. The other variables remain unaffected and the expected pecking order effects still hold. The findings are robust regardless of selection bias.

*Insert Table 11 here*

[9] The results are robust when Jensen's α is replaced by Sharpe ratio.

## Concluding Remarks

This study examines how institutions can affect capital structure decisions. We compare two groups of property companies operating in the same industry, but are listed in Mainland or Hong Kong. The tests reveal that in an institutional environment in which information asymmetries and agency conflicts are stronger, the agency and pecking order theories have stronger explanatory power.

More specifically, the independent variables that are directly related to corporate governance and information environments have larger coefficients for the Mainland-listed group in the various models. The impacts of the firm-specific corporate governance mechanisms are mostly as predicted by the agency theory. Managerial shareholding and ownership concentration are negatively associated with the debt ratio and there is an offsetting effect between them. The results indicate the stronger effects of these factors in the Mainland-listed companies. Controlling for the mean-reverting behaviors, variations in the debt ratio are strongly driven by available internal financing and investment needs, as the pecking order theory predicts. The pecking order effects are stronger in the capital structure decisions of the Mainland-listed companies. The findings are robust regarding the value discount of the untradeable shares, state ownerships, and selection bias.

Further tests on R-squared also illustrate the stronger explanatory power of the agency and pecking order theories in Mainland China. With firm-level corporate governance variables added to the baseline model, the increments of R-squared are larger for the Mainland models. Similarly, for the tests of the pecking order theory, the R-squared increments caused by the two pecking order variables are higher for the Mainland-listed group. Through this well-controlled comparison between Chinese real estate companies listed on different stock exchanges, we show that institutions not only affect the debt ratio directly, but also influence the way other factors work in financial decisions.

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**Table 1** A comparison of information disclosure regulations

| Items | Hong Kong | Mainland | Discussion |
|---|---|---|---|
| Disclosure of price sensitive information | Regulated systematically under the *Guide on disclosure of price sensitive information*, which is a part of the Listing Rule. | No systematic document governing the disclosure of price-sensitive information | Clearer rules in Hong Kong. |
| Policies on trading suspension | Trading is suspended when price-sensitive information is disclosed. (Effective from 2008, firms disseminating price sensitive information between 6:00 and 9:00, and between 12:30 and 14:00 do not have to suspend trading.) | Trading is suspended when: 1) periodic reports are published or abnormal events are announced; 2) unusual movements of trading volume or price are spotted (the observation period of unusual movements of price/trading volume is two trading days) | Unusual price or volume movements may not be due to failure to disclose relevant information. The frequent trading suspensions in Mainland could disrupt the normal function of the market. |
| Definitions of notifiable transactions | The cutting point of share and discloseable transactions is 5% of any percentage ratio (including the asset, consideration, profits, revenue, and equity capital ratios); the cutting point of discloseable transaction and major transaction is 25% of any percentage ratio. The corresponding requirements on disclosure for the three kinds of transactions are, respectively, notification, publication, and shareholders' approval. | The corresponding two cutting points are 10% and 50% of the total assets, respectively, with the same required disclosure approaches. | Hong Kong has a more stringent definition of notifiable transactions. |
| Enforcement on insider dealing | Hong Kong Securities and Futures Commission can directly prosecute suspected insider dealers. | The China Securities Regulatory Commission cannot directly prosecute suspects. It needs to go through other government departments. | Surveillance and enforcement in Hong Kong is more direct and efficient. |
| Approaches to information disclosure of major transactions | The listed issuer must send a circular to shareholders for major transactions. | Issuers are only required to publish notifications on newspapers and/or websites. | Shareholders are better protected in Hong Kong. |
| Punishment on breaking information disclosure regulations | A fine of up to HK$10,000,000 and/or a ten-year sentence | A fine of up to five times the illegal gains and/or a ten-year sentence | The regulations are similar, but in Mainland, the common practice is only public censure or administrative punishment. Criminal punishment is rare. |

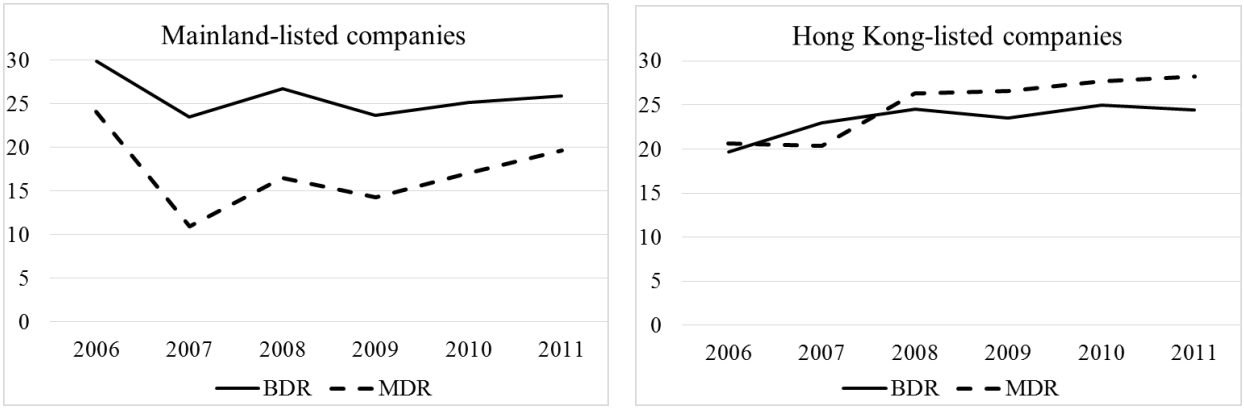
Source: listing rules of the Shanghai, Shenzhen, and Hong Kong stock exchanges[10]

[10] http://www.sse.com.cn/lawandrules/sserules/listing/stock/c/c_20120918_49621.shtml;http://www.szse.cn/main/files/2012/07/18/730589652605.pdf;http://www.hkex.com.hk/chi/rulesreg/listrules/mbrules/listrules_c.htm

**Table 2** A comparison of corporate governance indicators[11]

| Index | Hong Kong | Mainland | Score range | Period | Source |
|---|---|---|---|---|---|
| Legal Origin | English common law | German civil law | | 1998 | La Porta et al. (1998) |
| Legal Rights Strength | 10 | 6 | 0=weak, 10=strong | 2011 | World Bank Database |
| Legal Protection of Creditor Rights | 4 | 2 | 0=weak, 4=strong | 2007 | Allen et al. (2005); Djankov et al. (2007) |
| Legal Protection of Minority Shareholder Rights | 96 | 78 | 0=weak, 100=strong | 2006 | La Porta et al. (2006) |
| Rule of law | 8.22 | 5 | 0=weak, 10=strong | 1998 | La Porta et al. (1998) and Allen et al. (2005), respectively |
| Efficiency of Debt Enforcement | 88.3 | 43.6 | 0=weak, 100=strong | 2006-2008 | Djankov et al. (2008) |
| Anti-corruption | 179 | -47 | Higher numbers mean less corrupt | 1996-2000 | Worldwide Governance Indicators, World Bank Institute |

**Figure 1** The average debt ratios of the Mainland and Hong Kong-listed firms




[11]Modified from Claessens and Yurtoglu (2013).

**Table 3** Summary Statistics

| | Mainland | | | | Hong Kong | | | | difference-of-mean test |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Min | Max | S.D. | Mean | Min | Max | S.D. | t-statistics |
| BDR (%) | 25.598 | 0.000 | 61.158 | 14.290 | 23.805 | 0.000 | 59.137 | 12.442 | 1.748* |
| MDR (%) | 16.930 | 0.000 | 55.903 | 11.540 | 25.924 | 0.000 | 61.295 | 14.052 | -9.572*** |
| PROF | 0.059 | -0.203 | 0.251 | 0.047 | 0.068 | -1.115 | 0.350 | 0.096 | -1.487 |
| SIZE (lnRMB) | 8.252 | 5.380 | 12.181 | 1.248 | 9.183 | 4.350 | 12.095 | 1.734 | -8.597*** |
| dBTA | 0.138 | -0.810 | 0.985 | 0.220 | 0.157 | -1.449 | 0.818 | 0.247 | -0.986 |
| TANG | 0.638 | 0.000 | 0.997 | 0.177 | 0.621 | 0.032 | 0.990 | 0.209 | 1.323 |
| MTB | 3.425 | -41.301 | 16.754 | 3.889 | 1.098 | -1.715 | 21.345 | 1.488 | 9.567*** |
| MASH (%) | 15.905 | 0.000 | 89.410 | 25.443 | 37.831 | 0.000 | 85.000 | 28.059 | -11.046*** |
| TSH (%) | 52.838 | 16.700 | 92.220 | 17.725 | 62.074 | 5.184 | 96.950 | 13.495 | -7.528*** |
| SOE | 0.466 | 0.000 | 1.000 | 0.466 | 0.188 | 0.000 | 1.000 | 0.391 | 8.004*** |
| UTSH (%) | 39.200 | 0.000 | 92.000 | 26.621 | | | | | |

**Measurement of variables**

1) BDR = $\frac{\text{book value of debt}}{\text{book value of equity+book value of debt}}$; MDR = $\frac{\text{book value of debt}}{\text{market value of equity+book value of debt}}$.
2) PROF is profitability (i.e., EBIT divided by the book value of the total assets).
3) SIZE is firm size measured by the natural logarithm of the book value of the total assets.
4) dBTA is the annual changes in SIZE.
5) TANG is asset tangibility and is measured by the tangible assets divided by the book value of the total assets:
   Tangible asset (Hong Kong-listed) = inventories + properties held for sale + property, plants, and equipment + properties under development + the lease premium for land + investment property.
   Tangible asset (Mainland-listed) = inventories + fixed assets + properties under development + investment properties.[12]
6) MTB is the market-to-book ratio (i.e., the firm market value divided by the book value of the total equity).
7) MASH is managerial shareholding measured by the percentage of shares held by top managers and directors.
8) TSH is top shareholding or ownership concentration (i.e., the percentage of shares held by the top five shareholders). For Hong Kong-listed firms that reported fewer than five top shareholders, all reported shareholders are counted.[13]
9) SOE is a dummy variable that equals 1 for SOEs and 0 if otherwise.[14]
10) UTSH is the proportion of untradeable shares among the total number of shares.[15]

[12] Due to different accounting standards and, thus, different classifications of the sub-items of the tangible assets, the definitions seem different in mainland and Hong Kong, but they are actually comparable.
[13] All shareholders holding more than 5% of the shares are reported. This proximity will not cause too much difference.
[14] Following Ke (2008), SOEs are defined as enterprises whose largest shareholder is the state or its agent.
[15] After the split-share reform circa 2006, it has mainly consisted of shares with transaction restrictions because of the reforms. Due to data limitations, shares restricted for other reasons are not excluded from untradeable shares.

**Table 4** Pairwise correlation matrix

| | BDR | MDR | PROF | SIZE | TANG | MTB | MASH | TSH | SOE |
|---|---|---|---|---|---|---|---|---|---|
| BDR | | 0.860 | 0.004 | 0.509 | 0.164 | 0.002 | -0.083 | 0.076 | 0.219 |
| MDR | 0.893 | | 0.031 | 0.449 | 0.205 | -0.263 | -0.084 | 0.078 | 0.115 |
| PROF | -0.115 | -0.114 | | 0.402 | -0.058 | 0.036 | 0.217 | 0.239 | 0.032 |
| SIZE | 0.542 | 0.628 | 0.037 | | 0.114 | -0.103 | 0.130 | 0.174 | 0.259 |
| TANG | 0.214 | 0.179 | -0.129 | 0.119 | | -0.049 | 0.035 | 0.112 | -0.078 |
| MTB | -0.255 | -0.324 | 0.089 | -0.245 | -0.124 | | -0.014 | -0.071 | 0.029 |
| MASH | -0.120 | -0.142 | 0.165 | 0.009 | 0.008 | -0.007 | | 0.379 | -0.606 |
| TSH | -0.020 | -0.031 | 0.142 | 0.231 | 0.127 | -0.026 | 0.395 | | -0.133 |
| SOE | 0.248 | 0.260 | -0.065 | 0.263 | -0.017 | 0.029 | -0.559 | -0.085 | |
| UTSH | -0.109 | -0.190 | 0.117 | -0.078 | -0.008 | 0.141 | 0.304 | 0.631 | -0.119 |

Notes: refer to the notes of Table 3 for the variable definitions.

**Table 5** Baseline models

| | Debt ratio based on book value | | | Debt ratio based on market value | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| C | -22.943 *** | -19.244 *** | -3.700 | -21.706 *** | -13.166 *** | -8.540 * |
| | (-5.455) | (-4.601) | (-0.613) | (-7.372) | (-2.721) | (-1.626) |
| PROF | -33.468 *** | -25.883 *** | -7.585 | -24.684 *** | -15.844 ** | -8.839 |
| | (-3.007) | (-4.335) | (-0.606) | (-3.168) | (-2.294) | (-0.812) |
| TANG | 9.711 *** | 5.557 * | 4.154 | 3.822 * | 9.191 ** | -5.369 |
| | (3.226) | (1.809) | (0.948) | (1.813) | (2.586) | (-1.408) |
| SIZE | 6.246 *** | 4.418 *** | 1.828 *** | 5.770 *** | 3.699 *** | 2.071 *** |
| | (14.218) | (10.648) | (2.98) | (18.764) | (7.708) | (3.881) |
| MTB | -0.322 ** | 0.516 | -0.838 * | -0.290 *** | -1.905 *** | 1.615 *** |
| | (-2.274) | (1.19) | (-1.739) | (-2.928) | (-3.796) | (3.85) |
| Obs. | 491 | 277 | | 491 | 277 | |
| Firms. | 107 | 72 | | 107 | 72 | |
| $R^2$ | 0.373 | 0.326 | | 0.529 | 0.293 | |
| Wald test | | | | | | |
| F-statistics | | | 3.799 | | | 7.019 |
| p-value | | | 0.005 | | | 0.000 |

Notes: 1) ***, *, and * denote significance at the 1%, 5%, and 10% levels, respectively; t-statistics are in parentheses; 2) refer to Table 3 for the variable definitions; 3) ML refers to Mainland-listed, and HK refers to Hong Kong-listed.

**Table 6** The impact of corporate governance

| | Debt ratio based on book value | | | Debt ratio based on market value | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| C | -14.061 *** | -20.084 *** | 6.023 | -16.129 *** | -15.936 ** | -0.193 |
| | (-3.083) | (-3.496) | (0.803) | (-5.108) | (-2.402) | (-0.03) |
| PROF | -23.839 ** | -24.539 *** | 0.700 | -15.818 ** | -13.162 * | -2.656 |
| | (-2.159) | (-3.994) * | (0.056) | (-2.069) | (-1.854) | (-0.243) |
| TANG | 10.538 *** | 5.142 | 5.397 | 4.800 ** | 9.320 *** | -4.520 |
| | (3.565) | (1.67) *** | (1.245) | (2.345) | (2.62) | (-1.2) |
| SIZE | 6.041 *** | 4.419 | 1.622 ** | 5.757 *** | 3.651 *** | 2.106 *** |
| | (13.155) | (10.655) | (2.596) | (18.106) | (7.622) | (3.879) |
| MTB | -0.367 *** | 0.506 | -0.873 * | -0.313 *** | -1.836 *** | 1.524 *** |
| | (-2.643) | (1.154) | (-1.817) | (-3.257) | (-3.625) | (3.651) |
| MASH | -0.387 *** | -0.131 | -0.256 | -0.230 *** | -0.014 | -0.216 |
| | (-3.834) | (-1.076) | (-1.581) | (-3.294) | (-0.099) | (-1.539) |
| TSH | -0.148 *** | 0.048 | -0.196 ** | -0.119 *** | 0.082 | -0.201 *** |
| | (-4.282) | (0.68) | (-2.402) | (-4.99) | (1.007) | (-2.844) |
| MASH×TSH | 0.005 *** | 0.001 | 0.004 * | 0.003 *** | -0.001 | 0.004 * |
| | (3.673) | (0.583) | (1.77) | (2.943) | (-0.466) | (1.893) |
| Obs. | 491 | 277 | | 491 | 277 | |
| Firms. | 107 | 72 | | 107 | 72 | |
| $R^2$ | 0.411 | 0.344 | | 0.567 | 0.314 | |

Notes: 1) ***, *, and * denote significance at the 1%, 5%, and 10% levels, respectively; t-statistics are in parentheses; 2) refer to Table 3 for the variable definitions.

**Table 7** $R^2$ and $R^2$ increment

| | | BDR | | MDR | |
|---|---|---|---|---|---|
| | | ML | HK | ML | HK |
| *Panel A Institutions and corporate governance* | | | | | |
| | Equation (2) | 0.411 | 0.344 | 0.567 | 0.314 |
| | Baseline | 0.373 | 0.326 | 0.529 | 0.293 |
| | Increment | 0.038 | 0.018 | 0.038 | 0.021 |
| *Panel B Institutions and information asymmetries* | | | | | |
| Target from Equation (1) | Equation (3) | 0.305 | 0.182 | 0.566 | 0.238 |
| | Error correction component | 0.200 | 0.162 | 0.481 | 0.203 |
| | Increment | 0.105 | 0.020 | 0.085 | 0.035 |
| Target from Equation (2) | Equation (3) | 0.313 | 0.186 | 0.580 | 0.237 |
| | Error correction component | 0.206 | 0.165 | 0.492 | 0.200 |
| | Increment | 0.107 | 0.021 | 0.088 | 0.037 |

**Table 8** Impacts of an information environment

Panel A: Dependent variable = $\Delta BDR_t$

| | Target leverage from baseline model | | | Target leverage from agency model | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| Constant | -4.992 *** | 2.798 | -7.790 *** | -5.090 *** | 2.755 | -7.845 *** |
| | (-3.692) | (1.606) | (-3.516) | (-3.786) | (1.585) | (-3.557) |
| $DR_{t-1}$-$TDR_{t-1}$ | -0.311 *** | -0.318 *** | 0.007 | -0.331 *** | -0.325 *** | -0.006 |
| | (-8.253) | (-5.578) | (0.104) | (-8.561) | (-5.668) | (-0.091) |
| $PROF_t$ | -34.223 *** | -5.139 | -29.084 *** | -33.706 *** | -4.858 | -28.847 *** |
| | (-3.605) | (-0.85) | (-2.587) | (-3.572) | (-0.806) | (-2.578) |
| $\Delta BTA_t$ | 13.691 *** | 5.289 ** | 8.402 *** | 13.927 *** | 5.344 ** | 8.583 *** |
| | (6.811) | (2.212) | (2.679) | (6.972) | (2.241) | (2.751) |
| Obs. | 384 | 205 | | 384 | 205 | |
| Firms. | 103 | 63 | | 103 | 63 | |
| $R^2$ | 0.305 | 0.182 | | 0.313 | 0.186 | |

Panel B: Dependent variable = $\Delta MDR_t$

| | Target leverage from baseline model | | | Target leverage from agency model | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| Constant | -12.986 *** | -1.131 | -11.855 *** | -13.073 *** | -1.196 | -11.878 *** |
| | (-13.948) | (-0.627) | (-6.51) | (-14.272) | (-0.663) | (-3.557) |
| $DR_{t-1}$-$TDR_{t-1}$ | -0.316 *** | -0.255 *** | -0.061 | -0.357 *** | -0.256 *** | -0.101 * |
| | (-8.358) | (-5.051) | (-1.007) | (-9.177) | (-5.032) | (-3.558) |
| $PROF_t$ | -22.057 *** | 2.600 | -24.658 *** | -21.652 *** | 3.022 | -24.674 *** |
| | (-3.376) | (0.413) | (-2.666) | (-3.368) | (0.48) | (-3.560) |
| $\Delta BTA_t$ | 11.227 *** | 6.868 *** | 4.359 * | 11.434 *** | 6.949 *** | 4.485 ** |
| | (8.078) | (2.775) | (1.688) | (8.377) | (2.808) | (-3.559) |
| Obs. | 384 | 205 | | 384 | 205 | |
| Firms. | 103 | 63 | | 103 | 63 | |
| $R^2$ | 0.566 | 0.238 | | 0.580 | 0.237 | |

Notes: 1) ***, *, and * denote significance at the 1%, 5%, and 10% levels, respectively; t-statistics are in parentheses; 2) refer to Table 3 for the variable definitions.

**Table 9** Untradeable shares discounted by 80%

Panel A: Tests of the agency theory

| Dependent variable | BDR | | | MDR | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| C | -13.971 *** | -20.084 *** | 6.113 | -16.291 *** | -15.936 ** | -0.355 |
| | (-3.061) | (-3.496) | (0.815) | (-5.008) | (-2.402) | (-0.054) |
| PROF | -23.903 ** | -24.539 *** | 0.636 | -16.440 ** | -13.162 * | -3.278 |
| | (-2.165) | (-3.994) * | (0.051) | (-2.09) | (-1.854) | (-0.297) |
| TANG | 10.547 *** | 5.142 | 5.406 | 4.790 ** | 9.320 *** | -4.530 |
| | (3.569) | (1.67) *** | (1.248) | (2.274) | (2.62) | (-1.188) |
| SIZE | 6.044 *** | 4.419 | 1.625 *** | 5.866 *** | 3.651 *** | 2.215 *** |
| | (13.185) | (10.655) | (2.603) | (17.955) | (7.622) | (4.032) |
| MTB | -0.400 *** | 0.506 | -0.906 * | -0.332 *** | -1.836 *** | 1.505 *** |
| | (-2.679) | (1.154) | (-1.875) | (-3.119) | (-3.625) | (3.539) |
| MASH | -0.387 *** | -0.131 | -0.256 | -0.244 *** | -0.014 | -0.230 * |
| | (-3.837) | (-1.076) | (-1.582) | (-3.392) | (-0.099) | (-1.616) |
| TSH | -0.150 *** | 0.048 | -0.198 ** | -0.108 *** | 0.082 | -0.190 *** |
| | (-4.362) | (0.68) | (-2.436) | (-4.383) | (1.007) | (-2.649) |
| MASH×TSH | 0.005 *** | 0.001 | 0.004 * | 0.003 *** | -0.001 | 0.004 ** |
| | (3.673) | (0.583) | (1.77) | (3.088) | (-0.466) | (1.981) |
| Obs. | 491 | 277 | | 491 | 277 | |
| Firms. | 107 | 72 | | 107 | 72 | |
| $R^2$ | 0.411 | 0.344 | | 0.561 | 0.314 | |

Panel B: Tests of the pecking order theory

| | Target leverage from baseline model | | | | Target leverage from agency model | | | |
|---|---|---|---|---|---|---|---|---|
| | $\Delta BDR_t$ | | $\Delta MDR8_t$ | | $\Delta BDR_t$ | | $\Delta MDR8_t$ | |
| | ML | Dif. | ML | Dif. | ML | Dif. | ML | Dif. |
| Constant | -4.992*** | -7.791*** | -13.484*** | -12.353*** | -5.090*** | -7.846*** | -13.559*** | -12.364*** |
| | (-3.691) | (-3.515) | (-14.181) | (-6.716) | (-3.787) | (-3.557) | (-14.446) | (-6.764) |
| $DR_{t-1} -$ | -0.310*** | 0.008 | -0.329*** | -0.074 | -0.331*** | -0.006 | -0.361*** | -0.105* |
| $TDR_{t-1}$ | (-8.239) | (0.112) | (-8.738) | (-1.221) | (-8.558) | (-0.092) | (-9.379) | (-1.709) |
| $PROF_t$ | -34.194*** | -29.056** | -22.350*** | -24.950*** | -33.681*** | -28.822** | -21.973*** | -24.995*** |
| | (-3.601) | (-2.584) | (-3.349) | (-2.671) | (-3.569) | (-2.575) | (-3.335) | (-2.693) |
| $\Delta BTA_t$ | 13.686*** | 8.397*** | 11.561*** | 4.693* | 13.923*** | 8.579*** | 11.733*** | 4.784* |
| | (6.806) | (2.677) | (8.153) | (1.8) | (6.97) | (2.749) | (8.393) | (1.848) |
| Obs. | 384 | | 384 | | 384 | | 384 | |
| Firms. | 103 | | 103 | | 103 | | 103 | |
| $R^2$ | 0.305 | | 0.573 | | 0.313 | | 0.584 | |

Notes: 1) ***, *, and * denote significance at the 1%, 5%, and 10% levels, respectively; t-statistics are in parentheses; 2) the "βs" columns show the coefficients of the models of the Mainland-listed firms; 3) refer to Table 3 for the variable definitions.

**Table 10** Robustness with SOEs dropped from the sample

Panel A: Tests of the agency theory

| Dependent variable | BDR | | | MDR | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| C | -14.897 ** | -24.875 *** | 9.978 | -17.038 *** | -23.559 *** | 6.521 |
| | (-2.550) | (-3.695) | (1.119) | (-4.178) | (-2.976) | (0.770) |
| PROF | -8.205 | -26.423 *** | 18.218 | -6.033 | -14.209 * | 8.176 |
| | (-0.622) | (-4.116) | (1.244) | (-0.656) | (-1.883) | (0.589) |
| TANG | 14.218 *** | 7.486 ** | 6.732 | 7.120 *** | 11.490 *** | -4.370 |
| | (3.991) | (2.218) | (1.372) | (2.864) | (2.895) | (-0.938) |
| SIZE | 5.603 *** | 4.353 *** | 1.250 | 5.606 *** | 3.524 *** | 2.082 *** |
| | (8.754) | (9.077) | (1.564) | (12.565) | (6.251) | (2.745) |
| MTB | -0.335 ** | 0.519 | -0.854 * | -0.190 * | -1.644 *** | 1.454 *** |
| | (-2.189) | (1.146) | (-1.781) | (-1.666) | (-3.087) | (3.170) |
| MASH | -0.351 *** | -0.036 | -0.315 * | -0.225 *** | 0.115 | -0.340 ** |
| | (-3.348) | (-0.255) | (-1.771) | (-3.068) | (0.684) | (-2.013) |
| TSH | -0.139 *** | 0.098 | -0.237 ** | -0.096 ** | 0.192 * | -0.287 *** |
| | (-2.582) | (1.123) | (-2.307) | (-2.543) | (1.869) | (-2.945) |
| MASH×TSH | 0.005 *** | 0.000 | 0.005 * | 0.003 *** | -0.003 | 0.006 ** |
| | (3.293) | (-0.005) | (1.919) | (2.806) | (-1.183) | (2.388) |
| Obs. | 262 | 231 | | 262 | 231 | |
| Firms. | 62 | 59 | | 62 | 59 | |
| $R^2$ | 0.400 | 0.328 | | 0.553 | 0.294 | |

Panel B: Tests of the pecking order theory with dependent variable = $\Delta BDR_t$

| | Target leverage from baseline model | | | Target leverage from agency model | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| Constant | -7.766 *** | 3.327 * | -11.093 *** | -7.860 *** | 3.351 * | -11.211 *** |
| | (-4.360) | (1.699) | (-4.206) | (-4.441) | (1.714) | (-4.267) |
| $DR_{t-1}$-$TDR_{t-1}$ | -0.362 *** | -0.312 *** | -0.050 | -0.383 *** | -0.319 *** | -0.064 |
| | (-6.993) | (-5.002) | (-0.618) | (-7.201) | (-5.074) | (-0.785) |
| $PROF_t$ | -32.242 *** | -5.888 | -26.353 ** | -31.605 *** | -5.949 | -25.656 ** |
| | (-2.912) | (-0.912) | (-2.005) | (-2.872) | (-0.923) | (-1.960) |
| $\Delta BTA_t$ | 13.102 *** | 5.951 ** | 7.151 ** | 13.332 *** | 5.853 ** | 7.480 ** |
| | (5.235) | (2.274) | (1.977) | (5.362) | (2.240) | (2.076) |
| Obs. | 200 | 172 | | 200 | 172 | |
| Firms. | 58 | 52 | | 58 | 52 | |
| $R^2$ | 0.372 | 0.192 | | 0.379 | 0.195 | |

Panel C: Tests of the pecking order theory with dependent variable = $\Delta MDR_t$

| | Target leverage from baseline model | | | Target leverage from agency model | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| Constant | -14.525 *** | -0.375 | -14.150 *** | -14.624 *** | -0.362 | -14.261 *** |
| | (-11.753) | (-0.186) | (-6.086) | (-11.968) | (-0.180) | (-6.168) |
| $DR_{t-1}$-$TDR_{t-1}$ | -0.429 *** | -0.253 *** | -0.176 ** | -0.458 *** | -0.262 *** | -0.196 ** |
| | (-8.169) | (-4.604) | (-2.120) | (-8.514) | (-4.718) | (-2.306) |
| $PROF_t$ | -18.445 ** | 1.690 | -20.135 * | -18.003 ** | 1.693 | -19.696 * |
| | (-2.400) | (0.252) | (-1.736) | (-2.369) | (0.254) | (-1.708) |
| $\Delta BTA_t$ | 9.621 *** | 7.979 *** | 1.642 | 9.941 *** | 7.903 *** | 2.038 |
| | (5.535) | (2.958) | (0.515) | (5.790) | (2.937) | (0.643) |
| Obs. | 200 | 172 | | 200 | 172 | |
| Firms. | 58 | 52 | | 58 | 52 | |
| $R^2$ | 0.617 | 0.252 | | 0.625 | 0.256 | |

Panel D: $R^2$ and $R^2$ increment

| | | BDR | | MDR | |
|---|---|---|---|---|---|
| | | ML | HK | ML | HK |
| *Panel A Institutions and corporate governance* | | | | | |
| | Equation (2) | 0.400 | 0.328 | 0.553 | 0.294 |
| | Baseline | 0.365 | 0.318 | 0.521 | 0.283 |
| | Increment | 0.035 | 0.010 | 0.032 | 0.011 |
| *Panel B Institutions and information asymmetries* | | | | | |
| Target from Equation (1) | Equation (3) | 0.372 | 0.192 | 0.617 | 0.263 |
| | Error correction component | 0.264 | 0.165 | 0.549 | 0.215 |
| | Increment | 0.108 | 0.027 | 0.068 | 0.048 |
| Target from Equation (2) | Equation (3) | 0.379 | 0.196 | 0.625 | 0.271 |
| | Error correction component | 0.269 | 0.170 | 0.554 | 0.224 |
| | Increment | 0.110 | 0.026 | 0.071 | 0.046 |

Notes: 1) ***, *, and * denote significance at the 1%, 5%, and 10% levels, respectively; t-statistics are in parentheses; 2) refer to Table 3 for the variable definitions.

**Table 11** Selection bias

Panel A: Selection model

Dependent variable = 1 when a firm is listed in Mainland, and 0 otherwise

| Variables | Constant | SIZE | PROF | MTB | SOE | TSH | JENSEN |
|---|---|---|---|---|---|---|---|
| Coefficients | 3.007*** | -0.278*** | 0.671 | 0.096*** | 0.973*** | -0.014*** | -0.032* |
| Z-stat. | (8.625) | (-7.246) | (1.124) | (6.685) | (8.010) | (-4.069) | (-1.848) |
| Obs. | 768 | | | | | | |
| McFadden $R^2$ | 0.235 | | | | | | |

Panel B: Tests of the agency theory

| Dependent variable | BDR | | | MDR | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| C | -14.363 *** | -21.327 *** | 6.964 | -16.354 *** | -11.697 * | -4.657 |
| | (-3.164) | (-3.455) | (0.889) | (-5.208) | (-1.648) | (-0.685) |
| PROF | -30.304 *** | -25.267 *** | -5.037 | -20.632 *** | -10.678 | -9.953 |
| | (-2.679) | (-4.016) | (-0.392) | (-2.636) | (-1.476) | (-0.892) |
| TANG | 10.437 *** | 5.286 * | 5.151 | 4.725 ** | 8.830 ** | -4.105 |
| | (3.548) | (1.708) | (1.190) | (2.322) | (2.481) | (-1.093) |
| SIZE | 6.283 *** | 4.638 *** | 1.644 ** | 5.937 *** | 2.903 *** | 3.034 *** |
| | (13.427) | (8.084) | (2.179) | (18.343) | (4.399) | (4.636) |
| MTB | -0.718 *** | 0.469 | -1.187 ** | -0.574 *** | -1.710 *** | 1.136 *** |
| | (-3.570) | (1.056) | (-2.352) | (-4.129) | (-3.347) | (2.594) |
| MASH | -0.363 *** | -0.123 | -0.240 | -0.212 *** | -0.042 | -0.170 |
| | (-3.594) | (-0.999) | (-1.477) | (-3.039) | (-0.298) | (-1.208) |
| TSH | -0.116 *** | 0.055 | -0.171 ** | -0.096 *** | 0.059 | -0.155 ** |
| | (-3.165) | (0.764) | (-2.055) | (-3.770) | (0.713) | (-2.142) |
| MASH×TSH | 0.005 *** | 0.001 | 0.004 * | 0.003 *** | -0.001 | 0.004 ** |
| | (3.803) | (0.583) | (1.844) | (3.082) | (-0.469) | (1.962) |
| Inverse | -6.335 ** | -1.668 | -4.667 | -4.717 *** | 5.690 * | -10.407 *** |
| Mill's R | (-2.401) | (-0.554) | (-1.147) | (-2.585) | (1.644) | (-2.948) |
| Obs. | 491 | 277 | | 491 | 277 | |
| Firms. | 107 | 72 | | 107 | 72 | |
| $R^2$ | 0.418 | 0.345 | | 0.573 | 0.321 | |

Panel C: Tests of the pecking order theory with dependent variable = $\Delta BDR_t$

| | Target leverage from baseline model | | | Target leverage from agency model | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| Constant | -4.685 *** | 2.236 | -6.921 *** | -5.034 *** | 1.926 | -6.960 *** |
| | (-3.355) | (1.110) | (-2.810) | (-3.625) | (0.960) | (-2.840) |
| $DR_{t-1}$-$TDR_{t-1}$ | -0.314 *** | -0.318 *** | 0.004 | -0.331 *** | -0.328 *** | -0.004 |
| | (-8.297) | (-5.574) | (0.064) | (-8.551) | (-5.703) | (-0.051) |
| $PROF_t$ | -35.170 *** | -6.081 | -29.088 ** | -33.875 *** | -6.267 | -27.608 ** |
| | (-3.680) | (-0.968) | (-2.545) | (-3.563) | (-1.000) | (-2.426) |
| $\Delta BTA_t$ | 13.967 *** | 5.044 ** | 8.923 *** | 13.978 *** | 4.977 ** | 9.001 *** |
| | (6.864) | (2.072) | (2.802) | (6.903) | (2.050) | (2.838) |
| Inverse | -1.021 | 0.962 | -1.982 | -0.184 | 1.424 | -1.608 |
| Mill's R | (-0.884) | (0.559) | (-0.952) | (-0.161) | (0.829) | (-0.776) |
| Obs. | 384 | 205 | | 384 | 205 | |
| Firms. | 103 | 63 | | 103 | 63 | |
| $R^2$ | 0.307 | 0.184 | | 0.313 | 0.189 | |

Panel D: Tests of the pecking order theory with dependent variable = $\Delta MDR_t$

| | Target leverage from baseline model | | | Target leverage from agency model | | |
|---|---|---|---|---|---|---|
| | ML | HK | Dif. | ML | HK | Dif. |
| Constant | -12.370 *** | -2.155 | -10.215 *** | -12.718 *** | -2.503 | -10.215 *** |
| | (-12.946) | (-1.039) | (-5.077) | (-13.478) | (-1.209) | (-5.110) |
| $DR_{t-1}$-$TDR_{t-1}$ | -0.330 *** | -0.260 *** | -0.070 | -0.358 *** | -0.266 *** | -0.092 |
| | (-8.690) | (-5.121) | (-1.149) | (-9.218) | (-5.172) | (-1.489) |
| $PROF_t$ | -23.951 *** | 0.773 | -24.723 *** | -22.741 *** | 0.619 | -23.359 ** |
| | (-3.669) | (0.118) | (-2.638) | (-3.521) | (0.094) | (-2.506) |
| $\Delta BTA_t$ | 11.733 *** | 6.394 ** | 5.339 ** | 11.758 *** | 6.325 ** | 5.433 ** |
| | (8.416) | (2.537) | (2.044) | (8.526) | (2.511) | (2.092) |
| Inverse | -2.015 ** | 1.777 | -3.793 ** | -1.183 | 2.285 | -3.468 ** |
| Mill's R | (-2.541) | (1.000) | (-2.222) | (-1.522) | (1.278) | (-2.039) |
| Obs. | 384 | 205 | | 384 | 205 | |
| Firms. | 103 | 63 | | 103 | 63 | |
| $R^2$ | 0.574 | 0.241 | | 0.583 | 0.234 | |

Notes: 1) ***, *, and * denote significance at the 1%, 5%, and 10% levels, respectively; t-statistics are in parentheses; 2) refer to Table 3 for the variable definitions.