Chinese Cross-Listing and Dividend Policy:
Empirical Evidence on Bonding Theory

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ABSTRACT

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The purpose of this thesis is to examine the effects of overseas cross-listing on Chinese companies' dividend policy and to present evidence on the prevalence of the bonding theory. We believe that by cross-listing, Chinese companies bond themselves to a well-developed capital market with a more stringent legislation environment and therefore facilitate the improvement of their corporate governance. We hypothesize that cross-listing has a positive effect on the corporate governance, which results in a higher propensity of dividend payments. We collect data on all dual-listed and multiple-listed Chinese companies listed on the Hong Kong stock exchange, Singapore stock exchange, NYSE, or NASDAQ from 1993 to 2014. We use two samples to conduct the analyses: a full sample covering all cross-listed and non-cross-listed Chinese public firms, and a subsample containing all the cross-listed firms with their propensity score-matched non-cross-listed firms. The results for the full sample indicate more dividends per share, a higher dividend payout ratio, and a higher likelihood to pay cash dividends in cross-listed firms, while the results for the matched sample only suggests a higher dividend payout ratio in cross-listed firms compared to their counterparts. The results also reveal that Chinese cross-listed companies pay more dividends to overseas investors than domestic investors and the issuance of the Corporate Governance Code in 2002 improved corporate governance in Chinese companies.

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Table of Contents

1. Introduction

Cross-listing (sometimes referred to as "dual-listing" or "multi-listing") is known as a common strategy in which a firm lists its equity both on home country stock exchanges and on one or several overseas stock exchanges (Karolyi, 2012). The trend of cross-border listing started in the 1970s when a large number of public companies from developed markets listed their shares in foreign markets, and according to Foerster and Karolyi (1993), these companies list equity overseas to increase their share base and reduce the cost of raising capital. Starting in 1980, the number of cross-border listings began increasing, and during the 1990s, many emerging economies started to allow foreigners to invest in their stock market. China also opened its door to join the global economy in the early 1990s. During that time, the economy was transferred from purely politic-oriented to more economic-oriented, and two Chinese stock exchanges—the Shanghai and Shenzhen stock exchanges—were created. Nevertheless, massive government control still existed in the capital market and enterprises: the Chinese government issued a quota on public offerings. The restriction prohibited many companies from listing in their home market; as a result, these companies choose to cross list as an alternative way to raise capital.

A traditional explanation for cross-listing is market segmentation theory, introduced by Stapleton and Subrahmanyam in 1977. Previous studies have found that barriers, such as regulatory restrictions and asymmetric information problems, exist across different economies and capital markets all over the world. By cross-listing, a company listing its stock in a foreign equity market could overcome these barriers and reduce the cost of capital (see Alexander et al. 1988; Foerster and Karolyi, 1993; Karolyi, 1998; Stapleton and Subrahmanyam, 1977). Another theory, the bonding theory, is also supported by numerous researchers (e.g., Ayyagari and Doidge, 2010; Burns et al., 2007; Coffee 1999; Doidge, 2004; Reese and Weisbach, 2002; Stulz, 1999). It suggests a company whose home country has weak legislation and poor shareholder protection would be likely to suffer from an agency problem. To mitigate this governance problem, the company could cross list its shares in one or more foreign countries with a better legal environment and stronger protection for shareholders. Moreover, bonding has been proved to have a positive influence on minority shareholders, as their rights will be increased and protected better. Coffee (1999) found that firms which pursue growth to a global scale would uphold themselves to higher

legal standards and well-developed governance systems, which could disperse controlling rights from controlling shareholders to public shareholders. La Porta et al. (1998) stated that a more stringent legislation would prevent controlling shareholders from expropriating minority shareholders and encourage minority shareholders to exercise their rights. Ayyagari and Doidge (2010) argued that issuers adopt a cross-listing in the U.S. to promote changes in ownership and control. Regarding dividend payment, Grossman and Hart (1980), Easterbrook (1984) and Jensen (1986) found that the distribution of cash dividends cut the amount of cash owned by management, so it can prevent managers from making bad investments. Allen et al. (2000) and Allen and Michaely (2003) claimed that external control and monitoring are necessary to assure management made payout decisions according to the shareholders' interests instead of their own interests. Therefore, we deducted that improvement in corporate governance and shareholder rights could made cross-listed companies increase their dividend. As for China, Sun et al. (2012) came up with a "modern enterprise" or "governance" theory that explicated the reason for Chinese cross-listing. They stated that one reason for the Chinese government to list SOEs in a better-regulated market is to benefit from a "governance premium", learn from developed markets and establish modern enterprises domestically. The chief of the State Asset Commission has also emphasized that to build modern capital markets and modern enterprises, the government will continue selecting large SOEs to list abroad.

The purpose of this thesis is to test whether cross-listing increases companies' propensity to pay dividends and further to test the prevalence of the bonding theory. The propensity of paying dividends includes the amount of dividend payments and the likelihood of dividend payments. We also believe that Chinese companies benefit from developed market systems and stringent regulations to facilitate the development of corporate governance. Correspondingly, they have a higher propensity to pay dividends due to enhanced protection towards minority stockholders. Thus, we propose four hypotheses. First, we hypothesize that after cross-listing overseas, Chinese cross-listed firms are more likely to pay dividends than non-cross-listed companies. Second, we hypothesize that Chinese cross-listed companies pay more dividends than non-cross-listed companies. Third, Chinese companies that are cross-listed overseas pay more dividends to overseas investors than domestic investors, as we believe that despite the government's attempts to build a modern market and improve corporate governance, the protection for minority

shareholders is still weaker than in developed countries. Berkman et al. (2010) also stated that the Chinese legal system and market infrastructure still fall behind developed markets. Lastly, we expect that following the corporate governance reform, Chinese firms pay more dividends to their investors in the home country than before, as the corporate governance will be improved.

To investigate the impact of cross-listing on dividend payment propensity, a traditional approach is to run regression with a dependent variable that denotes dividend payments and dummy variables that denote cross-listing. However, there are several problems with the observed sample. First, it is difficult to observe the counterpart of cross-listing, as one company cannot be cross-listed and non-cross-listed at the same time. Therefore, a group of non-cross-listed companies were obtained to compare them with cross-listed companies. The second problem is selection bias, as cross-listed companies may have certain characteristics in common; for example, large, profitable and low-leverage companies are potential candidates for overseas listing (Sun et al., 2012 and Mei et al., 2009), so the estimation of the cross-listed sample is likely to be disturbed by those common characteristics. The third difficulty is the endogeneity problem: factors that both determine the cross-listing decision and the propensity to pay dividends. We use the propensity score matching (PSM) approach to find counterparts for the matched companies and to solve the problem caused by selection bias. An untreated company is selected to match a treated company according to the propensity scores, so we established a matched sample out of the whole sample. The matched sample consists of a control group (i.e., non-cross listed matches) and a treatment group (i.e., cross-listed firms). Then, we estimated several multivariate regressions separately with the matched and whole samples to determine whether the cross-listed companies pay more dividends and pay dividends more often. If the bonding theory could appropriately explicate the motivation of cross-listing, we expect improvements in corporate governance and stockholder protection and observe a relatively higher propensity in the cross-listed firms.

This research proposes a new method on supporting bonding theory. Past studies were focusing on stock prices, control rights and company performances. However, we suggested that the propensity to pay cash dividends reflect the level of corporate governance and protection towards minority shareholders, so we use dividend payment dummy, dividend per share and dividend yield to check if the changes and difference shows that cross-listing has a positive influence on dividend

payment. We collected the dividend payment in all markets where the company is cross-listed as well as the exchange rate and market value to make the dividend payment comparable. Furthermore, we conducted tests and ran regressions to determine whether cross-listing increase dividend payouts. If the results show significant increase or positive difference, we interpret this as a result of legal bonding. Also, past research rarely shed light on the prevalence of bonding theory in Chinese companies, as in China the situation is different from developed markets: governance control exists in the stock market and many enterprises are enforced to cross-listed overseas, so the topic is worth studying.

Furthermore, as we are also worried about other unobservable characteristics that may influence cross-listing and dividend payments at the same time, we used an interaction term to absorb the effects of unobservable situations. The approach is based on an exogenous event that is universal, mandatory and has an impact on cross-listing. The external event we made use of is the issuance of the Corporate Governance Code in 2002. This code was issued by the China Securities Regulatory Commission (CSRC) with the aim to enhance corporate governance. The implementation of the code is universal and effective, and corporate governance have been significantly improved since then (Sun et al., 2012). We conducted multivariate regression for the robustness check, using an interaction term (product of a cross-list dummy and year dummy) as independent variables. Since the event is initiated by the government, we suppose that this interaction variable captures the casual influence on the propensity of dividend payment, and if the bonding theory is true, the issuance of the code will have a positive influence on firms' propensity to pay dividends.

The results are overall in support of our hypothesis: Chinese cross-listed firms are more likely to pay dividends to their shareholders than non-cross-listed firms; Chinese cross-listed firms pay more dividends to their shareholders than non-cross-listed companies; Chinese firms that are cross-listed overseas pay more dividends to overseas investors than domestic investors. After the issuance of the Corporate Governance Code, Chinese firms pay more dividends to home-country investors than before.

The remainder of this thesis is organized as follows: Section 2 reviews the related literature; Section 3 develops the underlying hypotheses and describes the sample and variables; Section 4 provides details for the methodology; Section 5 reports the empirical results; and finally, Section 6 concludes.

2. Literature Review

2.1 Early studies on cross-listings

The trend in which firms list their shares in foreign equity markets began in the 1970s, when a large number of companies from developed economies listed their equity stocks overseas with the intention of increasing their shareholder base, diversifying their portfolios and earning higher returns and, most importantly, to reduce the cost of raising capital (Foerster and Karolyi, 1993). From 1980 to 1990, the number of cross-border listings continued increasing, and at that time many firms from emerging economies started opening their stock markets to foreign investors.

Earlier studies have identified several different motivations for cross-listing and have described how cross-listing is related to the cost of capital and information problems and how cross-listing influences firm value and corporate governance. The most prominent theory regarding the motivation for cross-listing is the market segmentation hypothesis: Companies list overseas to reduce the influence of market segmentation that increases firms' cost of capital (Bancel and Mittoo, 2001, 2008; Fanto and Karmel, 1997; Mittoo, 1992). Stapleton and Subrahmanyam (1977) said that firms are facing restrictions on certain individuals investing in certain securities and typically, investors are restricted by segmentation in international capital markets. Moreover, one possible solution for firms to overcome this restriction is the dual listing or multiple listing of their equity stocks on foreign capital exchanges. Alexander et al. (1988) stated that listing stocks on foreign exchanges is an important countermeasure for companies to overcome the difficulties due to market segmentation. Karolyi (1998) reviewed approximately 70 studies concerning the economic implications of companies' overseas listing decision. The author summarized that cross-listing reduces the risks of international investment and gives firms a chance to go global, and more stringent disclosure requirements makes it more difficult for firms to list shares abroad.

However, the number of cross-listed firms significantly declined in 2000. Karolyi (2006) described this downward trend in cross-listing and trading activities among countries: until the end of 2002, international cross-listing had reduced more than 50% compared to its highest point, whereby 4,700 companies were involved in cross-listing in 1997. Scholars (e.g., Karolyi, 2006; and Stulz, 1999) who were aware of this slowdown started to explain whether this decline is an anomaly due to market cycles or a structural break in the way in which firms globalize. So, they started to look for innovative ideas different from the conventional logic to explain this more sophisticated situation of cross-border listing.

New studies began to look at the relevance of cross-listing with conflicts between controlling shareholders and public shareholders, information asymmetries and several other corporate governance problems. Stulz (1999) argued that the reduction of cost of capital might come from the reduction of conflicts between management and investors due to informational-asymmetries and potential agency problems. He emphasized that managers might have more information about their firms' investment opportunities than shareholders, and further, they may have incentives to maximize their wealth instead of maximizing shareholders' wealth. The corporate governance system, including both the internal controls and external regulation environment, is a critical element that determines the cost of capital. When firms in less-developed capital markets raise capital in developed markets such as the U.S., they also learn from the more mature corporate governance systems and expose themselves to more effective monitoring. Thus, instead of saying that the barriers among countries may influence firms' cost of capital, Stulz (1999) argued that the more developed capital markets provide more active and effective minority investors as well as more stringent regulations, which is the reason of the reduction in firms' cost of capital. Gomes (2000) found that in countries where the legal system could not provide effective protection to minority shareholders, an agency problem is common among public firms. (Unlike the well-known definition, agency in this paper also includes the conflicts of interest between controlling shareholders and minority shareholders.)

2.2 Bonding theory

After the 2008 financial crisis, researchers have revised prevalent theories based on market segmentation and reconsidered the existing explanations of the evidence that supported firms' choice of cross-listing. Facing all these challenges, Stulz (1999) first developed a theory that indicates that management has the incentives to maximize its own value rather than shareholders' value. Thus, firms domiciled in countries with weak protection of shareholder's rights are willing to be exposed to a regulated environment with higher disclosure standards to transfer more control to minority shareholders and lead to a lower cost of capital. Coffee (1999) also supports the bonding theory in his studies. He mentioned that international listing is a process of self-selection. Firms pursuing growth to a global scale choose to abide by higher legal standards and well-developed governance systems that have been developing for decades in the U.S., and such bonding would disperse controlling rights from large shareholders to public shareholders. Coffee (1999) indicated that U.S. securities regulations should allow foreign firms that seek to improve their governance to enter U.S. equity markets. He also mentioned in his subsequent study (Coffee, 2002) that the prevailing practice of cross-border listing is to list and trade in countries where minority shareholders are well protected. According to La Porta et al. (1998) and Djankov et al. (2008), a more stringent legal system would prevent controlling shareholders from the expropriation of minority investors and provide minority investors with the ability to exercise their rights.

A host of studies have provided evidence supporting the bonding theory. Reese and Weisbach (2002) find that cross-listing makes it easier to raise capital, and firms from countries where minority shareholders' rights are poorly protected raise more equity in firms' home country than in the US. Doidge (2004) also supported the bonding hypothesis, by the evidence that foreign firms that cross list in U.S. have lower voting premiums than foreign firms that do not cross list. They further controlled firm-level and country-level characteristics, and the results show even larger differences in the premium. Additionally, only firms that subsequently cross listed had lower voting premiums in the years before the cross-listing. In the subsequent study by Doidge et al. (2009), this cross-listing premium also appeared to be reliable and consistent each year from 1990 to 2005. Ayyagari and Doidge (2010) found that before cross-listing, approximately 75% of the

surveyed firms had a controlling shareholder, but after, controlling shareholders' voting rights decreased to approximately 50%, with an average decrease of 24% compared to non-cross-listed firms. Furthermore, control changes happened in 22% of the sample firms. Therefore, they argue that issuers voluntarily adopt a cross-listing in the U.S. to assist with changes in ownership and control. By examining the takeovers of U.S. firms by cross-listed firms, Burns et al. (2007) found that an important benefit of cross-listing is better legal protection and a regulatory environment, as these firms increase their information disclosure and corporate governance.

2.3 Chinese stock market and cross-listing

The Chinese economy has been playing an important role in the global market since it opened its market to the world. According to a 2008 report of the CSRC, in 2008, more than 800 Chinese securities were listed and traded overseas, and the total funds raised have amounted to over 112 billion USD. The Chinese government employs a split-share system for the stock markets, where A-shares are traded in Shanghai and Shenzhen stock exchanges, available to domestic investors and denominated in RMB currency and B-shares are traded in Shanghai and Shenzhen stock exchanges, only available to overseas investors and denominated in foreign currency. H-shares refer to shares from mainland Chinese companies that are registered and traded in the Hong Kong Stock Exchange and denominated in Hong Kong dollars. A central planned economy was dominant in the country since the establishment of China; yet after Deng Xiaoping's economic reform in 1979 (open-the-door policy), the country began to open to foreign investment and to allow entrepreneurships and privatization; the economy gradually became more market oriented as a result. In the early 1990s, the two Chinese stock exchanges, Shanghai and Shenzhen, were established. Since then, the two exchanges have been controlled by the Chinese government. A quota on equity public offerings was approved and used by Chinese government to limit the quantity of shares being issued each year in these two exchanges, and most of the quota was allocated to state-owned enterprises (SOEs) and large companies. Due to this restriction, many large companies seeking growth failed to get listed, and many small- and medium-sized companies in need of more funds were prevented from entering the exchange market. Therefore, they must explore other channels to raise funds for firm expansion. This is one of the situations driving many Chinese enterprises to go abroad. Chinese companies have been allowed to be traded in foreign

markets since 1993[1], for example, in the U.S., U.K. Singapore and Hong Kong, and eventually, H-shares have become the highest in terms of number and public offering size.

A theory explaining the cross-listing of Chinese firms is the "modern enterprise" or "governance" hypothesis suggested by Sun et al. (2012), which is similar to the bonding theory. The Chinese economy is transferring to a market economy, while the regulation system and market infrastructure have not been developed well. The cross-listing (of SOEs) in a well-functioning market could be an opportunity for Chinese firms to learn from foreign companies, and the Chinese government can also establish "a modern enterprise system" at home. They also found evidence of the benefit from cross-listing in better-functioning markets: there is valuation premium in stock prices in companies that sell both A- and H-shares over companies with only A-shares. The author attributed this premium to a higher-level corporate governance in Hong Kong. However, this theory should be distinguished from the bonding theory, as the "bonding" is enforced by the government, but is not the choice of firms themselves.

On the other hand, market segmentation does not seem to be a correct reason for Chinese cross-listings. Sun and Tong (2000) and Wang and Jiang (2004) found evidence opposed to the traditional market segmentation theory. They observed discounts and a lower PE ratio in H-shares compared to their counterparts in A-shares. Therefore, if these enterprises are listing on the Hong Kong stock exchange to lower their cost of capital, choosing to list in Hong Kong is not a wise decision.

2.4 Dividend policy

Earlier researchers (Bhattacharya, 1979; Miller and Rock, 1985; Allen and Michaely, 2003) believed that companies pay dividends to communicate with investors and markets as well as to signal positive information to the public. High and stable cash dividends are positive signals that a company is gaining profit in the current year and will keep generating profit in the future, while low dividends or no dividends at all are negative signals that the firm is doing badly this year and

[1]On April 19, 1993, the State Council issued "A special Regulation on Raising Capital and Listing Overseas by a Joint-stock Company"

the prospects are not promising, either. Information on firms' performance is supposed to be passed to the public via dividend payments regardless of the decision makers' intention to signal good performance. Direct evidence of the signaling effect is when firms pay substantially high dividends, their stock prices go up (Allen and Michaely, 2003). An early study on why firms pay dividends was conducted by Bhattacharya (1979), in which the author defined and provided an explanation for signaling. Denis and Osobov (2007) studied the dividend payment propensity for companies in the U.S., Canada, U.K., Germany, France and Japan. They found that dividend payers are mostly larger and profitable firms, which is inconsistent with signaling, as the theory suggests firms that attempt to signal their good performance should be smaller and less profitable.

The re-distribution of excess cash is another view of dividend payouts. One hypothesis suggested by Berlingeri (2006) argues that the primary intention of firms paying dividends is to reallocate their free cash flow according to the current business cycle and according to future investment opportunities. In the early years of a company, the revenue generated internally cannot cover the cost of investment, so dividend payments are lower. Later, as the firm gains more capital, it becomes more willing to pay out excess free cash flow (Denis and Osobov, 2007). Grossman and Hart (1980), Easterbrook (1984) and Jensen (1986) explained this issue from an alternative perspective. According to Jensen and Meckling (1976), there are sustained conflicts between managers and shareholders, so when management controls significant disposable funds, the chance of overinvesting or investing in unprofitable projects will increase. Grossman and Hart (1980), Easterbrook (1984) and Jensen (1986) believe that the distribution of cash dividends is a solution to cut the amount of free cash held by management to reduce bad investments. However, Allen et al. (2000) and Allen and Michaely (2003) added in their research that it is management who determines the payout policy, so the policy must be in line with their interest or at least not be to their disadvantage. Therefore, external control and monitoring are necessary to assure payout decisions are primarily in line with shareholders' interests.

Some firm characteristics are widely known to have an influence on a company's propensity to pay dividends. Fama and French (2000) discovered that with an increase in the number of small firms with low profitability and more growth opportunities, the percentage of U.S. companies paying dividends has decreased. They believe that changing characteristics is the key influential

factor of dividend recession and found that the likelihood of payment depends on three firm-level characteristics: profitability, investment opportunities and firm size. The likelihood of dividend payout tends to be higher in profitable and larger firms and lower in firms with more investment opportunities. Ferris et al. (2006) studied the dividend payout propensity for public firms in the U.K. and assessed whether the reduction in payout in the U.S. was becoming global. Consistent with Fama and French (2000), they concluded that firms with a larger size and higher profitability are more likely to pay dividends, whereas firms with more investment opportunities are less likely to pay. Benito and Young (2001) also recorded this trend in dividend paying companies in the U.K. They examined the omissions and cutting of dividends with more firm-level characters. The study indicated that companies with a larger size, more cash flow and a higher level of actual investment have a lower propensity to omit dividends, while companies with higher leverage and more investment opportunities tend to omit dividends. Their examination on dividend cuts had the same results as the dividend omissions. Von Eije and Megginson (2006) studied 3400 public companies in the European Union and found that the dividend amount and payout frequency are positively related to the firm size and age, while the amount and frequency are negatively related to firms' growth rate and leverage. Denis and Osobov (2007) also found that dividend payers are mostly larger and more profitable companies.

3. Hypotheses

Our opinion on cross-listing is basically in support of the bonding hypothesis, and we expect to see an increase in the propensity of dividend payouts in cross-listed companies because of improved corporate governance. According to these previous studies on cross-listing and the bonding theory, we believe that the rigorous monitoring and regulation in the overseas stock markets and correspondingly improved corporate governance are factors driving management to pay more dividends. Grossman and Hart (1980), Easterbrook (1984) and Jensen (1986) concluded that companies pay cash dividends to cut the amount of cash controlled by managers to reduce the likelihood of making bad investment decisions. So, we see the tendency to pay cash dividend as a direct proxy of the corporation governance level. Moreover, Allen et al. (2000) and Allen and Michaely (2003) argued that external regulation and monitoring is a necessary way to guarantee that managers make payout decisions wisely. We believe that Chinese issuers who list their stock

equity on foreign exchanges that have better-developed regulation systems and stronger discipline towards management and/or controlling shareholders will be more willing to give out cash dividends and/or offer a higher dividend payout ratio. Thus, we develop hypotheses 1 and 2 as follows:

Hypothesis 1: Chinese cross-listed firms are more likely to pay dividends to their shareholders than non-cross-listed firms.

Hypothesis 2: Chinese cross-listed firms pay more dividends to their shareholders than non-cross-listed firms.

We expect that by cross-listing, firms bonding themselves to developed capital markets not only increase their dividend payments overseas, but also to home country shareholders. One of the arguments of Sun et al. (2012) is that many SOEs choose to go outside with the aim of introducing the corporate governance structure and legal system to develop the Chinese market. If these companies successfully bond themselves to higher regulation standards, there should be substantial progress in corporate governance. Hence, we postulate that governance and regulations have improved in China because of cross-listing, which is also a kind of bonding, whether it is the initiative for companies or a strategic policy of the government.

Although both overseas listings and corporate governance reform contribute to a better regulated and functioned capital market, still, we agree that corporate governance in China falls behind foreign markets, such as Singapore and the U.S. Berkman et al., (2010) examined Chinese trials of introducing new rules and regulations in 2002 and found these changes only partly effective, seeing that they virtually improved the protection of minority shareholders, whereas they cannot literally prohibit the expropriation of these shareholders in companies that have a strong link to the government. China has not established a market system that could be compared to a well-developed modern market. Therefore, we assume that Chinese firms pay less cash dividends to home country investors than to foreign shareholders. Before the issuance of the Corporate Governance Code in 2002, there were no differences in domestic payments between cross-listed and non-cross-listed companies. Now that reform has facilitated the improvement of corporate

governance, cross-listed firms should pay more attention to domestic shareholders and increase dividend payments. Therefore, we propose the following hypotheses:

Hypothesis 3: Chinese firms that are cross-listed overseas pay more dividends to overseas investors than domestic investors.

Hypothesis 4: After the issuance of "Corporate Governance Code" in 2002, cross-listed companies increase dividend payout to their domestic shareholders.

Overall, we suppose that firms trading their stock equities on developed countries' exchanges pay more cash dividends because of the better protection for minority shareholders by bonding themselves to mature stock markets. In addition, we hypothesize that dividend payers tend to be more profitable and nonpayers tend to have more investment opportunities. We also believe that to reduce management's poor decisions, firms with more free cash should have a higher propensity to pay dividend, so the amount of free cash flow should be negatively related to dividend payments. The establishment and operation of Chinese stock markets are more politically oriented, and Berkman et al., (2010) discovered that the 2002 Corporate Governance Code virtually improved the protection of minority shareholders, but the protection is not effective in companies that have a strong link to the government; thus, we need to control for level of state own in the following process, and we suppose that firms with a higher level of state control should have a lower propensity of paying dividends. Because we also expect that better corporate governance will lead to better protection for minority stockholders, a larger board size will be related to a higher propensity to pay cash dividends. Berlingeri (2006) found that the possibility for companies to pay dividends decreases as companies grow older; hence, we hypothesize that a firm's age is negatively related to its propensity to pay dividends. The amount of competition in industries is also considered to affect dividend payouts, as tough competition may result in a situation in which companies pay more dividends to signal investors or customers that that are trustworthy and promising. Moreover, we suppose that firms with more liabilities will have a lower propensity to pay dividends, and firms with higher sales growth are more willing to pay dividends.

4. Data

4.1 Sample selection

The full sample is supplied by Thomson Reuters Datastream, including all Chinese firms trading during the period of 1993–2014. Then, we removed all the B-share-only firms to obtain a sample consisting of 2,157 non-cross-listed firms. Here, we will introduce the Chinese split-share system to explain how we select sample firms. This paper focuses on three classes of shares on the Chinese stock market: A-shares, B-shares and H-shares. In addition, if a company issues both A- and B-shares, we consider B-shares foreign shares; Companies that only issue B-shares in mainland China will not be described as cross listed and are excluded from the sample. Since the objective of this thesis is to shed more light on the dividend payment policy for cross-listed companies, the study focuses on foreign IPOs, and the American Depositary Receipts (ADRs) are excluded from the sample.

Cross-listed firms are selected based on information provided by the China Stock Market & Accounting Research Database (CSMAR). From its China Overseas Listed Company Research Database, we obtained all Chinese firms listing in multiple stock exchanges (Hong Kong, Singapore, London and New York stock exchangess), and we removed those that list only overseas. Then, according to the previous selection criteria, B-shares and H-shares are only available to foreign investors and are denominated in foreign currency. We determined that if a cross-listed company issues both A- and B-shares, we consider the B-shares foreign shares. Companies that only issue B-shares or H-shares are considered overseas listed and are excluded from the sample. Finally, we obtained 73 cross-listed companies. Regarding non-cross-listed firms, all variables including dividends paid to domestic investors are available in Datastream. For cross-listed firms, most of the variables are available in the CSMAR; we also collected some missing dividends from firms' annual reports to complete the dataset. After removing observations that has missing data, we had a total of 25,750 firm-year observations.

Our dataset consists of Chinese public firms that only list in mainland China or multiple-list in mainland China and overseas, which is the whole sample and will be used in multivariate regressions. We also built a control group and a treatment group in the one-to-one matching

propensity score matching process and built a subsample consisting of matched firms. All firms in the control group are A-shares listed on the Shanghai or Shenzhen stock exchange, while all firms in the treatment group issue their shares on at least one mainland stock exchange and at least one foreign exchange.

4.2 Dependent variables

We measure the propensity of dividend payouts by the dividend yield, cash dividend per share and likelihood of dividend payments. The process of companies' dividend payments is generally as follows: managers submit a dividend payment proposal to the board of directors in the first year and the final decision will be made and news will be released in the second or third season of the next year; the dividend (if there will be) will be distributed to shareholders very soon after the news is released. The ex-dividend day, dividend per share and common shares outstanding on the ex-dividend day are fiscal-year data, all of which are in the next year. The appendix provides the definitions and calculation for all variables that we used in this paper.

The first important dependent variable is the annual dividend yields, which is calculated as the cash dividends per share divided by the closing price of each stock on the ex-dividend day. The dividend per share, closing price and ex-dividend date of stocks listing in mainland exchanges are collected from the CSMAR, while the dividend per share, closing price and ex-dividend date for overseas stocks are collected from Datastream on daily basis. In the regression models, the dependent variable *Dividend Yield 1* denotes the payout ratio that firms (cross-listed or not) offer to their domestic shareholders, and the dependent variable *Dividend Yield 2* denotes the weighted average payout ratio to all shareholders including foreign public investors, with a weight calculated by the daily closing price multiplied by the share outstanding on the ex-dividend day on each stock exchange (Hong Kong stock exchange, Singapore stock exchange and NYSE or NASDAQ as well as Shanghai A or Shenzhen A). For non-cross-listed firms, *Dividend Yield 2* equals the value of *Dividend Yield 1*.

The second dependent variable is the annual *dividends per share*, which indicates the total amount of cash dividends (in Chinese Yuan) divided by the total number of common shares outstanding,

which can also be found in the CSMAR or Datastream. The dependent variable *Dividend Per Share 1* represents the cash dividend per share that firms (cross-listed or not) pay to domestic common-share holders, while the dependent variable *Dividend Per Share 2* represents the weighted average amount of cash payments provided to all shareholders including foreign shareholders. The weights are calculated using the daily closing price multiplied by the share outstanding on the ex-dividend date on each stock exchange (Hong Kong stock exchange, Singapore stock exchange and NYSE as well as Shanghai A or Shenzhen A).

The last dependent variable is the *Dividend Payment Dummy* implying whether a firm chooses to pay dividends or not during the year. The *Dividend Payment Dummy* equals 1 when a company pays cash dividends during the fiscal year and equals 0 otherwise. An interesting discovery we made is that the likelihood of dividend payments to domestic stockholders and overseas stockholders is consistent, that is if a company pays cash dividends for a certain year to domestic shareholders, it must pay its foreign shareholders as well. There is no one company that pay dividend only to home-country investors or to foreign investors in any observation year. For this variable, therefore, we did not distinguish between the domestic *Dividend Payment Dummy* and *Dividend Payment Dummy*.

4.3 Independent variables and control variables

The variable *Dummy Crosslist* is the main variable of interest in our study, which equals 1 if a firm is cross listed during the observation year and 0 otherwise. This study also includes several control variables to absorb the potential impacts on dividends. There are some firm-level characteristics that we believe have an influence on dividend policies. Companies that have fewer growth opportunities are more willing to pay dividends (Fama and French, 2001). Following the study of Denis and Osobov (2007), who measured growth opportunities as the percentage change in total assets over the year, we control for *Invest* using the total asset growth rate. The *Free Cash Flow* is adopted as the control variable, as we believed that firms with more disposable cash would tend to pay more cash dividends to prevent management from disposing of them unwisely, and we calculated it as the percentage of net cash flow from operating activities compared to total assets. We also consider *Sales Growth* a factor that influences dividend policies. Berlingeri (2006) found

that the possibility for companies to pay dividends decreases along with as companies grow older. Therefore, we control *Firm Age* from a firm's year of incorporation to every observation year. *HHI Industry* is also considered to have an influence on dividends, as if the competition is tough in certain industries, the companies will be more willing to pay more dividends to signal investors or consumers that they are performing well. Since we also believe that the dividend policy of Chinese companies significantly depends on corporate governance, the variable *Board Size* is included as a proxy of governance.

Four variables are used during the PSM process, in which we are looking for factors that influence the choice of cross-listing and dividends. Caliendo and Kopeinig (2005) suggested a way to implement PSM, saying that there are two basic decisions in the approach: the model choice and the variables choice. They found out that it makes no difference in results whether a logit regression model or a probit regression model is practiced, but the choice of variables is critical. An identification rule, the conditional independence assumption (CIA), requires control variables to affect the treatment decision and the outcome variables simultaneously. The decision is the cross-listing, and the outcome variables are the *dividend yield*, *dividends per share* and *Dividend Payment Dummy*. According to Fama and French (2001), U.S. firms that are larger, more profitable and have fewer growth opportunities are likely to pay dividends. Fama and French (2001) and Denis and Osobov (2007) both adopted the market-to-book ratio to measure growth opportunities. In respect to profitability, Fama and French (2001) used ROA as measurement. Previous studies often adopted the absolute value of assets, or log asset, as a measurement of firm size; however, *Firm Size* has a high correlation with *State Own*, the portion of shares held by government to the total amount, because SOEs tend to be larger firms. We replace *Firm Size* with *State Own* in consideration of the Chinese situation in which the level of government control is one of the most critical influences on the governance decision of local companies. Moreover, before the Chinese government called off the quota on the IPO, the Chinese stock market had not been well-developed and was still immature, and Chinese enterprises had too much debt in their account but lacked equities, so they sought more capitals (Mei et al., 2009). However, due to the restriction policy, firms must wait in a long line to enter domestic exchanges, which is why they list their shares across the border. Thus, we suppose that the leverage ratio is another firm characteristic related to the cross-listing decision. Hence, the vector of independent variables consists of *leverage*, *ROA*,

State Own and *MB Ratio*. We did not adopt *Firm Age* because the variable is related to dividend payment but not cross-listing (some companies are cross-listed at the beginning and some choose to cross-list when their size is larger and they need more funds to grow).

5. Methodology

5.1 The propensity score matching process and univariate comparison

The aim of this thesis is to investigate the changes in the propensity of dividend payouts due to the cross-listing decision. However, one company cannot be cross listed (marked as treated) and non-cross-listed (marked as untreated) at the same time, which means we are not able to identify the counterpart of treated companies. This makes observation difficult; if we want to observe the dividend difference between these two groups of companies, ideally all firm-level characteristics and all other characteristics should be identical. As a solution to this, we obtain a group of companies as a comparison to the treated companies so that each unit in the treated group can be compared with a similar one. Nevertheless, comparing treated firms with a comparison group of untreated firms will result in possible sample selection bias. As noted in the paper of Sun et al. (2012), beginning in 1993, many Chinese SOEs had their stock equity listed overseas due to share issue privatization, and Mei et al. (2009) mentioned that Chinese companies cross-listing overseas could be motivated by the need for more equity to increasing their leverage ratio. Hence, it is likely that a cross-listed sample is bias towards large, profitable and low-leverage firms. Further, a difference in dividends between two groups of companies may be correlated with factors that also determine whether a firm decided to cross list instead of due to the influence of the cross-listing decision. Therefore, a simple OLS regression could not capture the casual effect of cross-listing on dividends.

$$Dummy\ Crosslist_{i,t} = \alpha_{i,t} + \beta_1 * Leverage_{i,t} + \beta_2 * ROA_{i,t} + \beta_3 * MB\ ratio_{i,t} + \beta_4 * State\ Own_{i,t}$$

To perform a PSM approach, first we conducted a probit regression for each year to estimate the propensity score that will be used in matching later. The probit regression is used to determine the cross-listing probability rather than estimating parameters. In the regression model, the dependent

variable is *Dummy Cross-listing*, where 1 denotes treated and 0 denotes untreated, and the vector of control variables consists of *Leverage, ROA, MB ratio and State Own*. According to Mei et al. (2009), Chinese enterprises are reported to have too much debt in their capital structure, which could drive them to list cross borders, as they are indeed willing to issue equity outside China. Thus, we use leverage as a determinant of cross-listing. As suggested by Fama and French (2001) and Ferris et al. (2006), companies that are more profitable have a higher propensity to pay dividend, so we followed their measurement and adopted ROA as a proxy for profitability. We also adopted the market-to-book ratio to measure the growth opportunity, as suggested by Fama and French (2001) and Denis and Osobov (2007). Furthermore, Cooper (2002) stated that the formation and the development of Chinese stock markets follows a political rather than a market-oriented approach. Therefore, we adopt *State Own*, the number of shares owned by the state to the total number of share outstanding (in percentage), in consideration of the situation in which the level of government control may affect governance decisions in Chinese companies. The approach is done on an annual basis. We consider firms that are cross listed one year before the observation year, firms cross listed in the observation year and firms that will be cross listed the next year as cross-listed firms. We run 16 probit regressions with *Dummy Crosslist* as the dependent variable and four independent variables to obtain the propensity scores for each year. According to the estimation results, we conducted a nearest (one-to-one) PSM, so each year we obtained several pairs of firms that matched with each other, so through the PSM period from 1994 to 2013, there are 33 matched pairs including 66 companies. Then, we added the observations of these matched pairs for each year, and in the end, the matched sample had 675 firm-year observations. The sample dropped from 73 cross-listed companies to 33 because many failed during PSM and there was a great deal of missing data.

After PSM, we conducted a diagnostic test to check the quality of PSM to ensure that there was no significance difference in the vector of control variables among the treated and the untreated groups. We re-estimate a probit regression with the final matched sample (33 pairs of matched companies). We used the *Dummy Crosslist* as the dependent variable and the same vector of PSM variables as the independent variables. We expect the coefficient of PSM variables to show no statistical significance, which indicates that the matching algorithm has successfully removed the

possible influence on the cross-listing decision by the four firm characteristics, so that we can directly observe the changes in outcome due to the cross-listing decision.

In addition, we did univariate comparisons to check whether the matching process removed the difference in the four control variables between the two groups. We reviewed the mean for untreated and treated groups as well as the differences in *Leverage*, *ROA, State Own* and *MB Ratio* between each group. We also examined their mean and difference in the dependent variables: *Dividend Per Share 1*, *Dividend Yield 1*, *Dividends Per Share 2* and *Dividend Yield 2*. Here, we expected to see a significantly higher propensity of dividend payouts for the cross-listed group. Moreover, only adopting the treated sample, we compared the dividends per share and dividend yield for the same firm. The mean of the dividends for overseas shareholders and the mean of dividends for mainland investors as well as the difference between these means will be presented, and what we expected to see is that the same cross-listed company have a higher propensity to pay dividends to foreign stockholders than to mainland stockholders.

5.2 Regression models

In this study, we examine the impact of cross-listing on companies' dividend policy using OLS regressions, which is tested separately in two samples, the original whole sample and the matched sample selected in the PSM process. We run first three regressions with 675 post-matching observations. In Model 1, we estimate whether cross-listing as well as certain control variables would affect the likelihood of dividend payment. In Model 2, we estimate how cross-listing influences the dividends per share; Model 3 indicates how cross-listing affects firms' dividend yield ratio.

Model 1:

$$Dividend\ Payment\ Dummy = \alpha_{i,t} + \beta_1 * Dummy\ Crosslist_{i,t} + \beta_2 * Invest_{i,t} + \beta_3 * Free\ Cash\ Flow_{i,t} + \beta_4 * Sales\ Growth_{i,t} + \beta_5 * Firm\ Age_{i,t} + \beta_6 * HHI\ Industry_{i,t} + \beta_7 * Board\ Size_{i,t}$$

Model 2:

$$Dividend\ Per\ Share\ 2 = \alpha_{i,t} + \beta_1 * Dummy\ Crosslist_{i,t} + \beta_2 * Invest_{i,t} + \beta_3 * Free\ Cash\ Flow_{i,t} + \beta_4 * Sales\ Growth_{i,t} + \beta_5 * Firm\ Age_{i,t} + \beta_6 * HHI\ Industry_{i,t} + \beta_7 * Board\ Size_{i,t}$$

Model 3:

$$Dividend\ Yield\ 2 = \alpha_{i,t} + \beta_1 * Dummy\ Crosslist_{i,t} + \beta_2 * Invest_{i,t} + \beta_3 * Free\ Cash\ Flow_{i,t} + \beta_4 * Sales\ Growth_{i,t} + \beta_5 * Firm\ Age_{i,t} + \beta_6 * HHI\ Industry_{i,t} + \beta_7 * Board\ Size_{i,t}$$

In Model 1, the dependent variable is the *Dividend Payment Dummy,* which takes a value of 1 if a firm pays dividends in the observation year and 0 if no cash dividend is paid. In Model 2, *Dividend Per Share 2* denotes the weighted average dividend per share for all shareholders of the listed market. In Model 3, the dependent variable *Dividend Yield 2* is the weighted average dividend per share over the closing share price for all shareholders in the listed market. The variable *Dummy Crosslist* is the key dummy variable we are studying, and it equals 1 if a firm is cross listed in the observation year and 0 otherwise. We have already controlled for *leverage, ROA, State Own* and *MB Ratio* in the matching process, and the control variables included in Models 1, 2 and 3 are *Free Cash Flow*, *Sales Growth*, *Firm Age*, *HHI Industry* and *Board Size*.

In regard to the whole sample, we estimate how cross-listing affects the likelihood of dividend payout in Model 4, where the *Dividend Payment Dummy* takes the value of 1 if cash dividends are paid and 0 if no cash dividend is paid. Model 5 estimates how cross-listing influences the dividends per share, whereby *Dividend Per Share 2* indicates the weighted average dividend per share for all shareholders. Model 6 examines how cross-listing influences firms' dividend yield ratio, and the dependent variable *Dividend Yield 2* is the weighted average dividend per share over the closing share price for all shareholders. Again, the main independent variable is *Dummy Crosslist*. The control variables *Invest*, *Free Cash Flow*, *Sales Growth*, *Firm Age*, *HHI Industry* and *Board Size* are adopted in the regression model. We also controlled for *Leverage, ROA, State Own and MB Ratio*, as the whole sample did not go through the matching process.

Model 4:

$$Dividend\ Payment\ Dummy = \alpha_{i,t} + \beta_1 * Dummy\ Crosslist_{i,t} + \beta_2 * Leverage_{i,t} + \beta_3 * ROA_{i,t} + \beta_4 * State\ Own_{i,t} + \beta_5 * MB\ Ratio_{i,t} + \beta_6 * Invest_{i,t} + \beta_7 * Free\ Cash\ Flow_{i,t} + \beta_8 * Sales\ Growth_{i,t} + \beta_9 * Firm\ Age_{i,t} + \beta_{10} * HHI\ Industry_{i,t} + \beta_{11} * Board\ Size_{i,t}$$

Model 5:

$$Dividend\ Per\ Share\ 2 = \alpha_{i,t} + \beta_1 * Dummy\ Crosslist_{i,t} + \beta_2 * Leverage_{i,t} + \beta_3 * ROA_{i,t} + \beta_4 * State\ Own_{i,t} + \beta_5 * MB\ Ratio_{i,t} + \beta_6 * Invest_{i,t} + \beta_7 * Free\ Cash\ Flow_{i,t} + \beta_8 * Sales\ Growth_{i,t} + \beta_9 * Firm\ Age_{i,t} + \beta_{10} * HHI\ Industry_{i,t} + \beta_{11} * Board\ Size_{i,t}$$

Model 6:

$$Dividend\ Yield\ 2 = \alpha_{i,t} + \beta_1 * Dummy\ Crosslist_{i,t} + \beta_2 * Leverage_{i,t} + \beta_3 * ROA_{i,t} + \beta_4 * State\ Own_{i,t} + \beta_5 * MB\ Ratio_{i,t} + \beta_6 * Invest_{i,t} + \beta_7 * Free\ Cash\ Flow_{i,t} + \beta_8 * Sales\ Growth_{i,t} + \beta_9 * Firm\ Age_{i,t} + \beta_{10} * HHI\ Industry_{i,t} + \beta_{11} * Board\ Size_{i,t}$$

5.3 Robustness test

Another problem we aim to avoid is endogeneity. We have mentioned that election bias exists in the treated sample, and except for that, we are still concerned about other unobservable characteristics that determines cross-listing and dividend at the same time. What we need is a quasi-natural experiment in which all companies undergo and observable exogeneous variation, and this variation should be an event that affects cross-listing. In 2002, CSRC issued the Corporate Governance Code, which is said to be very similar to an international standard. The code is implemented to regulate all the public firms in China in terms of governance. Sun et al. (2012) compared the performance of A-shares with the matched sample of H-shares through the period of code implementation, finding that although H-shares still maintain a premium over A-shares, the premium significantly decreased after 2002. Thus, they concluded that corporate governance among the listed firms in China has greatly been improved since 2002. We introduced an interact dummy variable: $post_{2002}$, which equals 1 for firm-year observation on or after the issuing of the Corporate Governance Code and 0 otherwise.

$$Dividend\ Yield = \alpha + \beta_3 * Crosslist\ Firm\ Dummy + \beta_2 * Post_{2002} + \beta_3 * Crosslist\ Firm\ Dummy * Post_{2002} + \beta_4 * leverage + \beta_5 * ROA + \beta_6 * State\ own + \beta_7 * MB\ Ratio + \gamma + \delta$$

We estimated the model above. The multivariate model is estimated with cross-listed and non-cross-listed companies that issued IPOs before 2002. For dependent variables, we use *Dividend Yield 1* indicating the dividend payout ratio that a firm offers to domestic shareholders. The main variable in this regression is *Crosslist Firm Dummy* multiplied by $Post_{2002}$. The dummy variable $post_{2002}$ equals 1 if the observation year is after (or includes) 2002, 0 otherwise. The cross-listed firm dummy presents 1 if the firm goes cross-listed during its lifetime and 0 if it never lists share equities outside mainland China. Therefore, this interaction term equals 1 only when the observation is a cross-listed firm and the observation year is after (or includes) the year of the exogeneous event. We also include a vector of control variables that might have influence on firm's choice of cross-listing (*Leverage*, *ROA*, *State Own* and *MB Ratio*). We hope the coefficient of the interaction term captures and reflects a casual effect of cross-listing. If the bonding theory is true, after 2002, there should be an obvious difference in the dividend yield compared to before, as corporate governance will be improved. The dividend payment amount should be improved correspondingly, and thus coefficients of *Crosslist Firm Dummy** $post_{2002}$ are expected to be positive and statistically significant.

6. Results

6.1 Summary statistics and diagnostic test

As stated, the completed sample consists of 2,230 Chinese public firms with 2,157 non-cross-listed firms and 73 cross-listed firms and includes 25,750 firm-year observations in total. Table 1 presents the correlations among all the independent variables and control variables. Table 2 illustrates the average of each variable included in this study based on the whole sample. It also provides detailed information on their mean values by groups (cross-listed and non-cross-listed), differences between the two groups and the level of significance. From table 2, we can get a general idea that *Dividend Yield 1* and *Dividend Yield 2 and Dividend Per Share 1* of corss-listed firms are higher than those of non-cross-listed firms.

Table 1: Correlation matrix

This table provides the Pearson correlation coefficients for all control variables included in the analyses. Main dependent variables and dummy variables are not considered.

	Leverage	ROA	State Own	MB Ratio	Free Cash Flow	Sales Growth	Invest	Firm Size	Firm Age	HHI Industry	Board Size
Leverage	1.000										
ROA	0.070	1.000									
State Own	-0.005	-0.007	1.000								
MB Ratio	-0.013	-0.030	0.004	1.000							
Free Cash Flow	-0.015	0.013	0.036	-0.017	1.000						
Sales Growth	>0	<0	-0.001	>0	-0.003	1.000					
Invest	<0	<0	-0.003	>0	-0.009	0.058	1.000				
Firm Size	-0.027	<0	0.015	0.007	0.082	0.008	0.016	1.000			
Firm Age	0.025	<0	0.148	0.008	-0.011	0.008	0.008	-0.098	1.000		
HHI Industry	0.007	0.037	0.030	-0.011	0.017	0.005	-0.003	0.009	0.017	1.000	
Board Size	0.017	-0.017	0.062	-0.0010	0.012	0.020	0.002	0.159	-0.025	0.030	1.000

Table 2: Summary statistics

This table reports the descriptive statistics (number of observation and mean) for the full sample, cross-listed subsample and non-cross-listed subsample. The "Difference test" column reports the differences of means between cross-listed group and non-cross-listed group are also reported. ***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively.

Variables	Whole sample		Cross-listed (1)		Non-cross-listed (0)		Difference Test
	Obs	Mean	Obs	Mean	Obs	Mean	(1) -(0)
Leverage	23,123	0.606	304	0.578	22,819	0.606	-0.029
ROA	23,120	0.995	304	0.041	22,816	1.007	-0.966
State Own	22,820	0.243	304	0.337	22,516	0.242	0.096***
MB Ratio	22,817	0.003	304	0.002	22,513	0.003	-0.001
Invest	20,986	0.872	288	0.160	20,698	0.882	-0.721
Free Cash Flow	21,046	0.044	271	0.052	20,775	0.044	0.008
Sales Growth	18,649	2.400	215	0.212	18,434	2.422	-2.210
Firm Age	23,127	16.600	304	17.651	22,823	16.586	1.065***
HHI Industry	23,004	0.128	264	0.139	22,740	0.127	-0.014
Board Size	20,228	9.775	259	12.293	19,969	9.743	2.551***
Dividend Per Share 1	23,031	0.083	288	0.107	22,740	0.138	-0.031
Dividend Yield 1	23,031	0.008	288	0.013	22,740	0.009	0.004***
Dividend per share2	23,127	0.084	304	0.170	22,823	0.083	0.087***
Dividend yield2	23,127	0.008	304	0.014	22,823	0.008	0.007***

Table 3 reports the results for post-match probit regression, and none of the four coefficients are statistically significant, which indicates no significant difference in the control variables among cross-listed and non-cross-listed companies. Therefore, PSM has removed the impact of *leverage*, *ROA*, *State Own* and *MB Ratio* on the decision of cross-listing. The results of the univariate comparison are shown in Table 4. Panel A includes the t-test results based on the post-match sample. We did not detect any statistically significant difference in the control variables between the control and treatment groups; thus, the differences between the four variables were reduced by PSM. The univariate comparison for dividends per share indicated no significant difference, which is incongruent with our expectation. However, for *Dividend Yield 1* and *Dividend Yield 2*, we found positive and significant differences, which is consistent with our deduction that cross-listed companies pay a higher dividend ratio than their counterparts. Because the dividend yield is the ratio of the dividends per share over the closing price, it should represent the dividend payment more accurately than the dividends per share. Panel B reports the univariate test for all cross-listed companies, showing the number, mean and difference in the dividends per share and dividend yield that companies allocate to domestic and foreign stockholders. There are significant positive differences in both the dividends per share and dividend yield, indicating that in the same group of cross-listed companies, foreign investors generally receive more dividend rewards than domestic investors.

In sum, both probit regression and univariate tests provide evidence that the matched group eliminated the noticeable dissimilarity in key firm characteristics: the dividend yield for cross-listed firms is significantly higher than their counterparts. In addition, there is no statistically significant difference in the dividends per share. In cross-listed companies, foreign investors generally gain higher dividend rewards than domestic investors, supporting our hypothesis that Chinese cross-listed firms pay more dividends to overseas investors than domestic investors.

Table 3: Diagnostic regression

This table reports parameter estimates from the probit model used in estimating the propensity scores for the cross-listed and non-cross-listed sample. We match non-cross-listed firms to cross-listed by a one-to-one approach, without replacement, using 4 firm characteristics: *leverage, ROA, State Own* and *MB Ratio*. The dependent variable in the probit model is the *Dummy Crosslist*. The "Post-Match" column contains the coefficients of the probit model estimated using the subsample of matched pairs of firms. Definitions of all variables are listed in the Appendix. T-statistics are displayed below the coefficients. ***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively.

Variables	Post-Match
Leverage	-0.031
	(-0.860)
ROA	-0.146
	(-0.850)
State Own	0.250
	(1.310)
MB Ratio	0.847
	(0.640)
Constant	-0.028
	(-0.350)
Observations	675
Pseudo R^2	0.005
P-value of x^2	0.346

Table 4: Univariate test

Panel A of Table 5reports the difference in means test results for the 33 pairs of cross-listed and non-cross-listed firms after matching. Panel B of Table 4 reports the balance test results for the dividend payment to overseas shareholders and mainland shareholders for the 73 cross-listed firms. ***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively.

Panel A					
	Cross-listed (1)		Non-cross-listed (0)		
Variables	Obs.	Mean	Obs.	Mean	Diff. (1) -(0)
Leverage	330	0.590	345	0.705	-0.115
ROA	330	0.040	345	0.103	-0.063
State Own	330	0.312	345	0.284	<0
MB Ratio	330	0.002	345	0.002	<0
Dividend Per Share 1	330	0.107	345	0.138	-0.031
Dividend Yield 1	330	0.013	345	0.009	0.004***
Dividend Per Share 2	330	0.173	345	0.139	0.035
Dividend Yield 2	330	0.173	345	0.138	0.006***
Panel B					
	Overseas (1)		Mainland (0)		
variables	Obs.	Mean	Obs.	Mean	Diff. (1) -(0)
Dividend per share	330	0.221	330	0.107	0.114***
Dividend yield	330	0.025	330	0.013	0.012***

6.2 Multivariate regression

In regard to multivariate regression, we first ran three regressions with the matched sample. The results are shown in Table 5. We ignored four control variables since they have been included in the PSM process and kept the other control variables: *invest*, *Free Cash Flow*, *Sales Growth*, *Firm Age*, *HHI Industry* and *Board Size*. Multivariable regression (1) provides the results for Model 1 in which the dependent variable is the *Dividend Payment Dummy*. The estimation for *e* is positive 0.148, but not significant. The results of Model 2 are shown in regression (2), and the coefficient for the dummy variable is 0.047, but not significant; therefore, cross-listing has no influence on the average dividend per share according to this equation. In regression (3) where *Dividend Yield 2* is the dependent variable, the estimation for *Dummy Crosslist* is 0.003 and is at a significance level of 95%, implying that cross-listed firms offer a slightly higher cash dividends yield. Hence, we conclude that cross-listed firms pay a higher yield than non-cross-listed firms, and the result remains consistent with the bonding theory, even after the matching procedure.

Table 5: Multivariate regression with matched sample

Table 6 reports the results for regressions of cross-listing's influence on propensity of dividend payment. Regression (1) is a probit regression on the likelihood of dividend payment. Regression (2) is a regression on the dividend per share. Regression (3) is a regression on the dividend yield. The sample includes all matched pairs of cross-listed firms and non-cross-listed firms. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Dividend Payment Dummy	Dividend Per Share 2	Dividend Yield 2
Dummy Crosslist	0.148	0.047	0.003**
Invest	2.249***	0.108	0.005
Free Cash Flow	5.888***	2.208***	0.029***
Sales Growth	-0.203	-0.026	<0
Firm Age	-0.055	-0.019**	<0
HHI Industry	-1.154	0.420	-0.013
Board Size	.0012	0.015**	>0
Constant	0.037	0.162	0.002
Prob > chi^2	0.000		
Pseudo R^2	0.078		
R^2		0.166	0.056
Adjusted R^2		0.155	0.046
Observations	518	518	518

For the control variables, the coefficients of *Free Cash Flow* are positive and significant in all three regressions, implying that the free cash flow is positively related to the propensity of dividend payouts. This supports our previous hypothesis that companies with more free cash flow have a higher propensity to pay dividends due to the need to restrict the management of using such cash inappropriately. The coefficients of the variable *Firm Age* are negative, with a 95% level of significance in regression (2), which in line with the conclusion of Von Eije and Megginson (2006) that firms pay less dividends as their age increases. Moreover, the coefficients of *Board Size* are significant in regression (2); therefore, we conclude that companies with larger boards pay more dividends. A larger board size may ensure better corporate governance and more protection towards minority shareholders, which could explain why the board size is positively related to the dividend payment. However, the coefficients of *invest* are statistically significant but positive in regression (1), which is somewhat inconsistent with our prediction that investment will reduce the dividend payment. The positive relation may due to the fact that high-speed growing companies are competitive and better-performing so they have a higher propensity to pay dividends.

The other three regressions are based on the whole sample, and all 73 cross-listed companies are included. The results are presented in Table 6 and are consistent with our prediction that with all other related variables controlled, the coefficients of *Dummy Crosslist* are positive and statistically significant. In regression (1), the coefficient of the dummy variable equals 0.709 with a significance level of 99%, so the cross-listed firms are 70% more likely to pay cash dividends than the non-cross-listed firms. In the second regression, the estimation for *Dummy Crosslist* equals 0.122 with a significance level of 99%, meaning that overall, the cross-listed firms pay more cash dividends per share to shareholders than the non-cross-listed firms. In equation (3), the coefficient of the dummy variable is 0.005 with a 99% significance level, indicating that the dividend payout ratio is higher for cross-listed firms than non-cross-listed firms. In all, the coefficients of the dummy variables in regressions (1) (2) and (3) are significant. The results points to the conclusion that companies that cross list on overseas stock exchanges have a higher propensity of paying dividends. The explanation could be that Chinese companies that (on purpose or not) bond themselves to better-developed capital markets (the U. S., Hong Kong, Singapore, the U.K. and so on) will experience development in corporate governance and in majority shareholder protection;

the proof is the growing likelihood of dividend payments, the growing dividends per share and the increasing dividend payout ratio.

Table 6: Multivariate regression with whole sample

Table 7 reports the results for regressions of cross-listing's influence on propensity of dividend payment. Regression (1) is a probit regression on the likelihood of dividend payment. Regression (2) is a regression on the dividend per share. Regression (3) is a regression on the dividend yield. We use the full sample which includes 73 cross-listed companies and 2157 non-cross-listed companies. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Dividend Payment Dummy	Dividend Per Share 2	Dividend Yield 2
Dummy Crosslist	0.709***	0.122***	0.005***
Leverage	-2.037***	<0	<0
ROA	0.012***	<0	<0
State Own	0.386***	0.031***	0.005***
MB Ratio	-0.089	0.011	<0
Invest	<0	>0	<0
Free Cash Flow	3.582***	0.070***	0.004***
Sales Growth	>0	<0	<0
Firm Age	-0.117***	-0.007***	<0***
Hhi Industry	-0.751***	-0.033***	-0.004***
Board Size	0.068***	0.004***	>0***
Constant	2.260***	0.141***	0.011***
Prob > chi^2	0.000		
Pseudo R^2	0.119		
R^2		0.069	0.059
Adjusted R^2		0.068	0.059
Observations	18528	18528	18528

The coefficient of *State Own* is positive and statistically significant in all the regressions, which means that the propensity of dividend payments is largely dependent on the level of state control, and the degree of government control is positively related to both the likelihood and amount of the dividend payments. This is inconsistent with the deduction that minority shareholders get less protection in companies that has a strong link to the government. Even though companies with high level of government control do not protect their shareholders well, these companies are larger in size, more profitable, so they have a higher propensity to pay dividends. In regression (1), the coefficient of *leverage* is negative and significant and the coefficient of *ROA* is positive and significant, indicating that firm leverage is negatively related to dividends, but ROA is positively related to the probability of paying dividends. These results confirm our deduction that profitable

companies and companies with more state control pay more dividends, while companies with more liabilities than equity pay less dividends. Furthermore, the coefficients of both *Free Cash Flow* and *Board Size* are estimated to be statistically significant positive in three models, which is in line with the hypothesis that the amount of free cash flow and larger boards will have positive influences on the propensity to pay cash dividends. Moreover, estimations for both *Firm Age* and *HHI Industry* are negative and significant, consistent with our hypothesis that companies have a lower propensity to pay dividends as they grow older, and when competition in the industry is higher, they have a lower propensity to pay.

6.3 Robustness checks

Table 7 shows the results of the robustness test in the multivariate regression framework. Our aim is to examine whether the issuance of the Corporate Governance Code has an influence on the dividend payout ratio and whether the development of corporate governance will increase the dividend payment. The estimation of *crosslist firm dummy** $post_{2002}$ equals 0.007 and is highly significant at the 99% level, which shows that cross-listed companies increased their dividend payout ratio to domestic shareholders after 2002. The coefficient of $post_{2002}$ is also positive and significant at 95%, implying that after the code was issued, Chinese companies increased their dividend payout ratio to their domestic shareholders. As mentioned, in 2002 the CSRC issued the Corporate Governance Code and was supposed to improve corporate governance among all companies. Sun et al. (2012) also found that corporate governance among listed firms in China has greatly improved after 2002. The explanation is that a Chinese governance revolution improved corporate governance and the protection of minority shareholders, so companies have a higher propensity of paying cash dividends. For that reason, we conclude that improvements in corporate governance increase the dividend payout ratio in Chinese cross-listed companies to investors of their home country.

Table 7: Multivariate regression on domestic dividend payment

Table 8 reports the results from the Multivariate regression. The multivariate model is estimated with cross-listed and non-cross-listed companies that issued IPO before 2002, the year when corporate governance Code was issued. Dividend Yield 1 (dividend paid to domestic shareholders) is the dependent variable. Crosslist Firm Dummy* Post_{2002} is the interaction term. The control variable Crosslist Firm Dummy equals to 1 if a company go cross-listed during its lifetime. Post 2002 equals to 1 if the observation year is after 2002 (including year 2002). ***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively.

Independent Variables	
Crosslist Firm Dummy* Post_{2002}	0.007***
Crosslist Firm Dummy	0.003
Post_{2002}	0.007**
Leverage	<0
ROA	<0
State Own	0.005***
MB Ratio	0.001
Constant	0.001
Industry FE	YES
Year FE	YES
R^2	0.112
Adjusted R^2	0.109
Observations	17,521

6.4 Limitations

We lost a great amount of firm-year observations during propensity score matching process; the number of cross-listed companies shrinks from 73 to 33 and ends up with 675 firm-year observations including cross-listed and non-cross-listed companies. Because some of the companies still have missing data on the four control variables and some of them failed the matching process, and we only have 73 cross-listed companies compared to the 2,157 non-cross-listed companies, so the treatment group is small at the beginning. One possible solution to this is a traditional two-step matching suggested by Ritter (1991). Ritter (1991) matched U.S. firms with Chinese firms first by industry and then by the closest market value. Proelss, et al (2016) studied based on 1,312 publicly traded firms in China and 1,912 U.S. companies, six different matching algorithms are employed to match Chinese companies and U.S. companies, including this two-step matching algorithm and nearest neighbour propensity score matching. However, the disadvantage of the traditional matching process is the lack of balancing among variables. As in the approach of Ritter (1991), the only criterion is a closest market value after the author classify industries. As a result, matched companies could be significantly different in other characters, such as leverage ratio, governance control, firm size, ROA and so on. Propensity score matching

balances treatment and control groups on many covariates, which are Leverage, ROA, MB Ratio and State Own in our research, and we considered the matched sample are matched better on four variables instead of 4. Another solution could be increasing the sample base. If we include ADRs and foreign IPOs (no need to be cross-listed), we will have more data in the treatment group.

7. Conclusion

The aim of our study of Chinese cross-listed and non-cross-listed companies is to prove the bonding theory by examining the casual effect of cross-listing on the propensity of dividend payments. The study is based on 2157 Chinese cross-listed companies and 73 non-cross-listed companies. Instead of using the traditional simple OLS estimation method for regression dividend payments on a cross-listed dummy variable, we constructed an untreated group to compare with the treated group. We conducted a one-to-one PSM based on two kinds of companies and the propensity scores so that significant variations in firm-level control variables were moved during the matching process. Then, we ran six multivariate regressions separately using the whole sample and a matched sample, and with the likelihood of dividend payment, dividends per share and dividend yield as the dependent variables. The results for the matched sample are consistent with the second hypothesis that Chinese cross-listed firms pay more dividends to their shareholders than non-cross-listed companies. The results for the whole sample are in correspondence with both the first and second hypotheses that Chinese firms that are cross-listed are more likely to pay dividends, and pay more dividends, than non-cross-listed companies. The univariate test results supported the first hypothesis and confirmed hypothesis 3 that Chinese cross-listed companies pay more dividends to overseas investors than domestic investors.

For robustness tests, we used the exogeneous change initiated by the Chinese government as well as the *Crosslist Firm Dummy* to construct interaction variables. The interaction term is used to test the effect of the Corporate Governance Code on the propensity of dividend payouts to domestic stockholders. We expected that the corporate governance reform would have a positive influence on dividend payments by facilitating the protection of minority shareholders. Specifically, we ran a regression on dummy variables denoting the variation in 2002 due to the reform. The results are in line with hypothesis 4 that following the corporate governance reform, cross-listed Chinese

firms increased their payout ratio to their domestic investors. In regard to the bonding theory, the study offers a new perspective on testing the theory, according to which firms are self-selected to list in a foreign market that has more stringent regulations and a better legal environment to improve corporate governance and the protection towards minority shareholders (Coffee, 1999). We hypothesized that the protection of minority shareholders is reflected in a firm's propensity to pay cash dividends, as dividends directly reflect the shareholder's value. Hence, we conducted tests and ran regressions on the propensity to pay dividends to determine whether cross-listing would have a casual and positive impact on dividend payouts, and if the results demonstrated a significantly positive influence, we interpret this as due to legal bonding. There are two limitations in the study. First, we used PSM to establish the treatment and control group, however, a traditional way might give us a larger matched sample, so later study could try more matching algorithms. Second, we specifically focused on dual- and multi-listing companies in China, yet in regard to future studies, we suggest including ADRs and more foreign IPOs into the sample.

References

Alexander, G. J., Eun, C. S., & Janakiramanan, S. (1988). International listings and stock returns: Some empirical evidence. *Journal of Financial and Quantitative Analysis* 23, 135-151.

Allen, F., Bernardo, A. E., & Welch, I. (2000). A theory of dividends based on tax clienteles. *Journal of Finance* 55, 2499-2536.

Allen, F., & Michaely, R. (2003). Payout policy. *Handbook of the Economics of Finance* 1, 337-429.

Ayyagari, M., & Doidge, C. (2010). Does cross-listing facilitate changes in corporate ownership and control?. *Journal of Banking & Finance* 34, 208-223.

Berlingeri, H. O. (2006). Yes, after All, in an MM World, Dividends Are Irrelevant. Available at SSRN: https://ssrn.com/abstract=905045

Bhattacharya, S. (1979). Imperfect information, dividend policy, and "the bird in the hand fallacy. *Bell Journal of Economics* 10, 259-270.

Burns, N., Francis, B. B., & Hasan, I. (2007). Cross-listing and legal bonding: Evidence from mergers and acquisitions. *Journal of Banking & Finance* 31, 1003-1031.

Coffee Jr, J. C. (1998). Future as history: The prospects for global convergence in corporate governance and its implications. *Nw. UL Rev* 93, 641.

Coffee Jr, J. C. (2002). Racing towards the top?: The impact of cross-listings and stock market competition on international corporate governance. *Columbia Law Review* 102, 1757-1831.

Denis, D. J., & Osobov, I. (2007). Why do firms pay dividends? International evidence on the determinants of dividend policy. *Journal of Financial Economics* 89, 62-82.

Doidge, C. (2004). US cross-listings and the private benefits of control: evidence from dual-class firms. *Journal of Financial Economics* 72, 519-553.

Doidge, C., Karolyi, G. A., & Stulz, R. M. (2009). Has New York become less competitive than London in global markets? Evaluating foreign listing choices over time. *Journal of Financial Economics* 91, 253-277.

Easterbrook, F. H. (1984). Two agency-cost explanations of dividends. *American Economic Review* 74, 650-659.

Foerster, S. R., & Karolyi, G. A. (1993). International Listings of Stocks: The Case of Canada and The U.S. *Journal of International Business Studies* 24, 763-784.

Grossman, S. J., & Hart, O. D. (1980). Takeover bids, the free-rider problem, and the theory of the corporation. *The Bell Journal of Economics* 11, 42-64.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3, 305-360.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review* 76, 323-329.

Karolyi, G. A. (1998). Why do companies list shares abroad?: A survey of the evidence and its managerial implications. *Financial Markets, Institutions & Instruments* 7, 1-60.

Karolyi, G. A. (2006). The world of cross-listings and cross-listings of the world: Challenging conventional wisdom. *Review of Finance* 10, 99-152.

Mei, J., Scheinkman, J., & Xiong, W. (2009). Speculative trading and stock prices: evidence from Chinese A-B share premia. *Annals of Economics and Finance* 10, 225–255.

Miller, M. H., & Rock, K. (1985). Dividend policy under asymmetric information. *The Journal of finance* 40, 1031-1051.

Proelss, J., Schweizer, D., & Zhan, F. (2016). China: From Imitator to Innovator?. Available at SSRN: https://ssrn.com/abstract=2846428

Ritter, J. R. (1991). The long‐run performance of initial public offerings. *Journal of Finance*, 46, 3-27.

Reese, W. A., & Weisbach, M. S. (2002). Protection of minority shareholder interests, cross-listings in the United States, and subsequent equity offerings. *Journal of Financial Economics* 66, 65-104.

Stapleton, R. C., & Subrahmanyam, M. G. (1977). Market Imperfections, Capital Market Equilibrium and Corporation Finance. *Journal of Finance* 32, 307-319.

Stulz, R. M. (1999). Golbalization, corporate finance, and the cost of capital. *Journal of Applied Corporate Finance* 12, 8-25.

Sun, Q., Tong, W. H., & Wu, Y. (2012). Overseas listing as a policy tool: Evidence from China's H-shares. *Journal of Banking & Finance* 37, 1460-1474.

Sun, Q., & Tong, W. H. (2000). The effect of market segmentation on stock prices: The China syndrome. *Journal of Banking & Finance* 24, 1875-1902.

Wang, S. S., & Jiang, L. (2004). Location of trade, ownership restrictions, and market illiquidity: Examining Chinese A-and H-shares. *Journal of Banking & Finance* 28, 1273-1297.

Appendix

Table of Variable definitions

This table provides information of definition and calculation for all variables that we adopted in this paper.

Variable Name		Description and Calculation
Dividend Per Share 1	=	Dividends per share for Chinese mainland shareholders in Chinese local currency (CNY) during the observation year
Dividend Per Share 2	=	Weighted average dividends per share for shareholders of all listed markets shareholders in CNY during the observation year
Dividend Yield 1	=	Dividends per share over the closing share price for Chinese mainland public shareholders during the observation year
Dividend Yield 2	=	Weighted average of dividends per share over the closing share price for shareholders of all listed markets during the observation year
Dividend Payment Dummy	=	Dividend payment dummy equals 1 if dividends are paid in the observation year, 0 otherwise
Dummy Crosslist	=	Dummy Crosslist equals 1 when the firm is cross-listed overseas in the observation year, 0 otherwise
Crosslist Firm Dummy	=	Crosslist firm dummy equals 1 if the firm has been cross-listed overseas during its lifetime, and equals if only listed in the home country
Post_{2002}	=	Equals 1 when the observation year is 2002 or after 2002, and 0 when the year is before 2002
Leverage	=	Total liabilities over total assets
ROA	=	Net profit after taxes over total assets
State Own	=	The percentage of shares owned by the State to the total number of outstanding shares
MB Ratio	=	Ratio of firm's market value to its book value
Free Cash Flow	=	Net cash flow from operating activities over the total assets
Sales Growth	=	Cash received from the sales of goods or rendering of services
Invest	=	Total asset growth rate
Firm Size	=	Logarithmic of a firm's total market value
Firm Age	=	Observation year minus the year of establishment
HHI Industry	=	Herfindahl-Hirschman Index for industry
Board Size	=	Total number of board members