Three Essays in Corporate Finance: The Case of Chinese Firms and Foreign Listing

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Abstract

The thesis contains three empirical studies that investigate the effect of a Hong Kong listing on Chinese firms. The first study (Chapter 3) investigates whether a Hong Kong listing improves Chinese firms' investment efficiency. Using a large sample of Chinese listed firms from 2001 to 2015, the study finds that investments by Hong Kong-listed Chinese firms have a higher sensitivity to investment opportunities (Tobin's Q) compared with their domestically listed peers. Also, Hong Kong-listed Chinese firms are not associated with underinvestment. Overall, the findings suggest that a Hong Kong listing improves Chinese firms' investment efficiency.

The second study (Chapter 4) uses a sample of attempted and completed acquisitions to examine whether a Hong Kong listing affects Chinese firms' acquisition behaviour. Using the propensity score matching method, Hong Kong-listed Chinese firms are matched with domestically listed Chinese firms over the period 2001 to 2015. The study finds that Hong Kong-listed Chinese firms are less likely to be bidders compared with their domestically listed peers. Furthermore, the study finds that Hong Kong-listed Chinese firms are more likely to make completed acquisitions compared to their domestically listed peers.

The third study (Chapter 5) investigates the payment method used in over 2,000 completed acquisitions over the period 2001 to 2015 by Hong Kong-listed Chinese firms compared to their domestically listed peers. The study finds that Hong Kong-listed Chinese firms are more likely to use all-cash payments in acquisitions. However, in cross-border deals, all-cash payments are less used by Hong Kong-listed Chinese firms. Also, the study finds that Hong Kong-listed Chinese firms using all-cash payments have a high level of excess cash. Furthermore, these Hong Kong-listed Chinese firms are more likely to experience positive abnormal returns when using all-cash payments.

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Chapter 1 Introduction

1.1. Motivations and objectives

A firm usually chooses to list on its domestic stock exchange, but sometimes chooses to list on a foreign exchange as a strategic choice. Sarkissian and Schill (2016) define foreign listing as a situation where a firm lists its shares on a non-domestic exchange, and suggest that the terms "foreign listing, overseas listing, or cross-listing" can be used interchangeably in academic research. This thesis uses the same definition of foreign listings as Sarkissian and Schill (2016). Chinese firms listed in Hong Kong are classified as firms that have a foreign listing, even though Hong Kong is formally part of China. A foreign listed firm usually faces different transparency, disclosure, and governance-related requirements in the foreign market (Karolyi, 2012). With the pace of globalization in capital markets, the total number of foreign listings had increased around the world since the early 1980s (Sarkissian and Schill, 2016). During the 1990s, the number of firms traded on major exchanges outside their home markets had reached as high as 4,700 (Karolyi, 2006). In the early 2000s, however, the number of foreign listed firms witnessed a significant decrease, to only 2,300, a decline of over 50% (Karolyi, 2006). In 2010, the World Federation of Exchanges (WFE) reported that more than 3,000 foreign listed firms are traded on over 40 major stock exchanges across the world. Numerous firms choose to list their shares in the US using American Depositary Receipts (ADRs) and other popular destination markets for foreign listings are the UK, Continental Europe, Hong Kong, and Singapore (Karolyi, 2012).

The reason for a firm choosing to list on a foreign stock exchange is an unresolved puzzle. Foreign listings have become a subject of academic studies and have attracted the attention of many researchers in recent years. The mainstream research examining the effect of foreign listings mainly focuses on foreign listings in the US stock market. The finance literature highlights four main motivations for foreign listings: overcoming market segmentation (Miller, 1999; Foerster and Karolyi, 1999), increasing stock liquidity (Mittoo, 1992; Domowitz et al., 1998), enhancing investor recognition (Merton, 1987; Foerster and Karolyi, 1999), and improving investor protection (Stulz, 1999; Coffee,1999; Reese and Weisbach, 2002; Doidge et al., 2004). Additionally, researchers also identify other motivations: improving information disclosure (Huddart et al., 1999), seeking economic synergies (Sarkissian and Schill, 2004), and pursuing business strategy

(Pagano et al., 2002). However, there are a limited number of studies on the relation between foreign listings and corporate investments (Foucault and Frésard, 2012; Abdallah and Abdallah, 2017). Recently, Foucault and Gehrig (2008) developed a new theory based on a learning channel, whereby cross-listing improves information flows from the stock market to cross-listed firms. Their theory, called the "managerial learning hypothesis[1]", argues that cross-listing can improve managers' ability to obtain more precise information about the value of their growth opportunities from the stock market, and that this enhances the value of their investments.

China's economy has experienced rapid growth and became the second-largest economy in the world in 2010[2], and had a GDP of $14.34 trillion US dollars in 2019.[3] The proportion of the private sector in the country's GDP expanded from less than 20% in 1996 to over 60% in 2019.[4] In recent years, China's economic power has substantially increased due to the phenomenal growth of the private sector.[5] China can be characterised as a large transition economy that has moved away from being a planned economy towards being a market-oriented economy since the 1980s. Therefore, Chinese privately-owned firms are more likely to exhibit market economy-like behaviour than Chinese state-owned firms. However, Chinese state-owned firms obtain various policy support from the Chinese government. For example, Chinese state-owned firms can more easily access capital from the Chinese banking system. Therefore, Chinese privately-owned firms are more likely to choose to list overseas to achieve growth.

In recent years Chinese firms have pursued listings on global stock exchanges (Pan and Brooker, 2014). For example, Alibaba Group Holdings Ltd. proceeded with its initial public offering (IPO) on the NYSE in 2014, which was the largest IPO in US history at that time.[6] The Stock Exchange of Hong Kong (SEHK) is a leading stock exchange in

[1] The managerial learning hypothesis is based on the information asymmetry between managers and stock market traders. Stock market traders have information that managers do not have, and that information is incorporated in stock prices. Managers can extract some information from stock prices to help their decisions.
[2] Barboza David. (2010) China Passes Japan as Second-Largest Economy. *The New York Times*, accessed on 16 August 2010 at: https://www.nytimes.com/2010/08/16/business/global/16yuan.html
[3] The data is from the World Bank.
[4] The data is from National Bureau of Statistics of China.
[5] Kevin Lu. (2015) China's economy: the four engines of growth. *Financial times*, available at: http://www.ft.com/intl/cms/s/0/b628a6ec-e08a-11da-9e82-0000779e2340.html
[6] Available at: https://www.nyse.com/network/article/Alibaba-Lists-on-the-NYSE

the world and the fastest-growing stock exchange in Asia. At the end of 2020, it had 2,538 listed firms with a combined market capitalization of HK$47 trillion.[7] Pan and Brooker (2014) argue that Chinese firms tend to choose the Hong Kong stock market when first listing abroad due to its geographical, cultural, and social proximity to mainland China.[8] Many Chinese firms are listed on the SEHK, including state-owned firms and privately-owned firms, and together they account for the largest proportion (over 50%)[9] of all listed firms in Hong Kong.

The reason why mainland Chinese firms choose to list on foreign stock exchanges is different for state-owned firms and privately-owned firms. The existing literature states that there is a connection between Chinese state-owned firms' foreign listings and government intervention (e.g., Hung et al., 2012; Sun et al., 2013; Pan and Brooker, 2014). For example, Sun et al. (2013) argue that the use of H-shares[10] became a policy tool of the Chinese government as it chose to list many state-owned firms on the SEHK when engaging in share issue privatization (SIP) as part of the reforming and restructuring of the Chinese economy.[11] Pan and Brooker (2014) state that government policy orientation affects the geography of Chinese firms' overseas listings. On the other hand, the reasons why Chinese privately-owned firms are also listed on foreign stock exchanges relate to firm-level considerations. For example, Peng and Blevins (2012) argue that Chinese privately-owned firms choose to list overseas to obtain a lower cost of capital because the financial environment in mainland China hinders Chinese privately-owned firms' growth. As Chinese state-owned firms and privately-owned firms have different reasons for a foreign listing, the effect of foreign listings on the two categories of Chinese firms may be different.

[7] "HKEX Monthly Market Highlights". Retrieved 22 January 2021.
[8] Mainland China, also known as the Chinese mainland, is the People's Republic of China (PRC) that excludes the special administrative regions of Hong Kong and Macau.
[9] This information is from the study by Filip et al. (2020).
[10] An "H-share" firm is a Chinese firm traded on the Stock Exchange of Hong Kong but incorporated in mainland China. The H-shares listed in Hong Kong are approved by the China Securities Regulatory Commission (CSRC). "H-shares" are officially disclosed by the Stock Exchange of Hong Kong.
[11] If Chinese state-owned firms are listed on foreign stock exchanges with high listing requirements, it will help to modernize the corporate system in China. Also, Chinese state-owned firms have an opportunity to utilize foreign capital to develop their business, to make up for the domestic capital shortage. As China's stock exchanges are young and underdeveloped, Chinese state-owned firms that list on foreign stock exchanges can relieve new IPO pressure on the domestic stock exchanges.

The main reason why Chinese state-owned firms list on the SEHK is to accomplish the strategic aims of the Chinese government (Peng and Blevins, 2012; Sun et al., 2013). It might therefore be reasonable to presume that the managers of Chinese state-owned firms will be more inclined to put the interests of the government ahead of investor interests. There is thus likely to be a higher agency cost for Chinese state-owned firms that list on the SEHK. First, because of the higher accounting, legal, and governance standards associated with Hong Kong, a Hong Kong listing enables investors to better monitor the managers of Chinese state-owned firms. However, the effect of a Hong Kong listing at the legal level on Chinese state-owned firms is not clear from the academic literature. Second, a Hong Kong listing may also provide another mechanism that influences the managerial behaviour of Chinese state-owned firms, based on the activities of investors. As the Hong Kong stock market has a better information environment (a higher level of disclosure) compared to mainland Chinese stock markets, the stock prices of Hong Kong-listed firms contain more information than the stock prices of mainland Chinese listed firms. This information channel may mitigate the information asymmetry that exists between managers and investors. However, the effect of a Hong Kong listing on Chinese state-owned firms based on the information channel is, similarly, not clear-cut based on the academic literature.

The reasons why Chinese privately-owned firms list on the SEHK are mainly driven by firm-level factors: for example, to realize corporate strategy (Peng and Blevins, 2012). Although Chinese privately-owned firms may wish to bond to higher corporate governance standards on the SEHK they may still exhibit high agency costs. For example, Filip et al. (2020) find that Chinese privately-owned firms are more likely to engage in corporate misbehaviour (i.e., earnings management) after a Hong Kong listing. The effect of a Hong Kong listing on Chinese privately-owned firms based on differences in legal requirements of China and Hong Kong is not clear from the academic literature. A Hong Kong listing also may provide another mechanism to affect the managerial behaviour of privately-owned firms based on the information channel (i.e., investors' activities). Similarly, the effect of a Hong Kong listing on Chinese privately-owned firms, based on the information channel, is not clear-cut from the academic literature.

Overall, a Hong Kong listing can provide two mechanisms that affect corporate investments and M&A activities. One is a mechanism operating at a legal level, that is,

the higher accounting, legal, and governance standards of a Hong Kong listing; another is a mechanism operating at the information level, that is, the stock prices of Hong Kong-listed firms contain more information than the stock prices of mainland Chinese listed firms due to different information environment on the SEHK compared to the mainland Chinese stock markets. However, the effects of these two mechanisms on a Hong Kong listing by Chinese firms are yet unknown. Additionally, corporate investments or M&A activities could be influenced by whether a Hong Kong listing eases access to external capital. Compared with the less developed financial system in mainland China, Hong Kong, as an important international financial centre, has advantages in financing. Nevertheless, whether a Hong Kong listing positively influences Chinese firms' corporate investments or M&A activities has not yet been clearly established.

Actually, there are three categories of Chinese firms listed on the Stock Exchange of Hong Kong (SEHK), i.e., H-share, Red chip[12], and P chip[13]. Therefore, the SEHK provide an ideal sample for investigating the difference between three categories of Chinese firms that they have different reasons to list in Hong Kong. The main characteristic of a Hong Kong listing is that Chinese firms can directly list on the SEHK rather than using a depositary receipt programme, like other major stock exchanges. For example, if Chinese firms are planning to list on US stock exchanges, the American depositary receipt (ADR) programme is the only channel available. However, the existing studies that address the topic from a Chinese perspective mainly choose H-shares as the sample to investigate Chinese firms' foreign listings, with Red chips and P chips usually neglected. An important category of Chinese firms traded on the SEHK is the "P chip" firms that are incorporated outside mainland China but controlled by private owners from mainland China, which is first addressed by Filip et al. (2020). Chinese state-owned firms usually list on the SEHK as either "H-shares" or "Red chips". Therefore, it is worth investigating the three different categories of Chinese firms (i.e., H-share, Red chip and P chip) listed on the SEHK to find if there are different outcomes

[12] A "Red chip" firm is a Chinese firm traded on the Stock Exchange of Hong Kong but incorporated outside mainland China, and controlled by mainland Chinese government entities. "Red chips" are also officially disclosed by the Stock Exchange of Hong Kong. The main difference between Red chips and H-shares is that that the latter is incorporated in mainland China.

[13] There is no official definition of P chip by the Stock Exchange of Hong Kong. FTSE Russell provides a definition of P chips listed on the Stock Exchange of Hong Kong, namely that a "P chip" firm is a Chinese firm traded on the Stock Exchange of Hong Kong but incorporated outside mainland China. It is controlled by individual Chinese entities and the majority of its revenues or assets are derived from mainland China.

for these categories of foreign listings.

Specifically, the main objective of the thesis is to investigate the effect of a Hong Kong listing by these three types of Chinese firms on their corporate investments and on their M&A activities. The thesis contains three empirical studies that investigate the effect of a Hong Kong listing, the results of which are reported in Chapters 3 to Chapter 5. The first specific objective of the research, the results of which are reported in Chapter 3, is to investigate whether a Hong Kong listing improves Chinese firms' investment efficiency compared with their domestically listed peers. A second objective of the research reported in Chapter 3 is to discover whether Hong Kong-listed Chinese firms are associated with overinvestment or underinvestment compared with their domestically listed peers. These objectives are important for a number of reasons: Hong Kong operates a common law system, which is different from the system used in mainland China (i.e., it has a different level of investor protection); the Hong Kong stock market is more transparent compared to the mainland Chinese stock markets (i.e., the information environment is different). Therefore, because of these differences from mainland China, and because many Chinese firms are listed in the Hong Kong stock market, it is of interest to investigate whether Chinese firms make more efficient corporate investments in a listing environment that offers greater investor protection and transparency.

The next set of research objectives (Chapter 4) examines whether a Hong Kong listing influences Chinese firms' acquisition behaviour. Specifically, the first objective is to investigate the likelihood of Chinese firms listed in Hong Kong making acquisitions compared with their domestically listed peers. The second objective is to examine whether a Hong Kong listing improves Chinese firms' abilities to make successful acquisitions. The third objective is to investigate whether a Hong Kong listing improves Chinese firms' abilities to learn from, or listen to, the stock market in acquisition decision making. These objectives are important because of some reasons: Hong Kong is an important international financial centre that can provide more financing opportunities for listed firms compared to firms listed on mainland Chinese stock markets (i.e., financing advantages may affect acquisitions); the Hong Kong stock market has higher accounting, legal, and governance standards compared to mainland Chinese stock markets, and also has a better information environment (i.e., better investor protection may affect the

agency costs of acquirers). These reasons motivate the investigation of whether and how a Hong Kong listing influences Chinese firms' acquisition behaviour.

Finally, in Chapter 5, the first objective is to examine whether a Hong Kong listing influences the payment choice of acquirers (i.e., all-cash, all-equity, or mixed payments) in corporate acquisitions. The second objective is to investigate whether an acquirer's level of excess cash affects the choice of payment method in acquisitions. The third objective is to examine acquirers' abnormal returns during the M&A announcement period. These objectives are important because: if Chinese firms are listed in Hong Kong they will have access to more financing opportunities as Hong Kong is an important international financial centre (i.e., financing advantages may affect the payment choice in acquisitions); Hong Kong provides higher investor protection compared to mainland China as it operates a common law system (i.e., higher investor protection may affect the agency costs of acquirers). Thus, it is of interest to examine whether a Hong Kong listing influences Chinese firms' choice of payment method in acquisitions.

1.2. Theoretical background

There are a number of different theories that can potentially explain the cross-listing decision, so it is helpful to begin with a description of the evolution of cross-listing theories.

1.2.1. The development of cross-listing theory

Traditional theories of cross-listing argue that it is a way to overcome market segmentation and to improve stock liquidity. For example, Karolyi (2006) points out that early empirical studies of cross-listing examine the share price reaction to a foreign listing[14], and he also states that most authors associate foreign listing with a desire to overcome investment barriers, and to improve stock liquidity. A useful summary of cross-listing theories is provided by Foucault and Gehrig (2008). They identify some explanations for cross-listing, which are: first, to avoid investment barriers, also known as the "market segmentation theory"; second, to enhance stock liquidity, also known as the "liquidity theory"; third, to increase firms' visibility, also known as the "investor

[14] Sarkissian and Schill (2016) argue that the terms "foreign listing, overseas listing, or cross-listing" can be used interchangeably in academic research. Although some firms only choose to list on a foreign exchange, they still provide some information about their domestic market.

recognition theory"; and fourth, to restrain expropriation by controlling shareholders, also known as the "legal bonding theory". Foucault and Gehrig (2008) then add a new explanation for cross-listing, which they call the "learning hypothesis" based on an information channel that enables firms to learn from the stock market. In addition, a review of the theories of cross-listing by Dodd (2013) includes the view that cross-listing is associated with the disclosure requirements of the foreign market, which is called the "information disclosure theory". Dodd (2013) also identifies a geographical factor as a consideration for the choice of the cross-listing destination market, which is called the "proximity preference theory". Furthermore, Dodd (2013) also suggests that the cross-listing decision is associated with a firm's global business strategy, which is known as the "business strategy theory".

1.2.1.1. Market segmentation theory

An early study by Stapleton and Subrahmanyam (1977) discusses market segmentation and corporate financial decisions. Market segmentation may be caused by various types of market imperfections including investor restrictions and taxes. They suggest that a firm domiciled in a segmented market may overcome investment barriers by cross-listing in a foreign market. Alexander et al. (1987) argue that a variety of investment barriers could be caused by transaction costs, information costs, and legal restrictions. Several theoretical models focus on the equilibrium market price caused by investment barriers: for example, Errunza and Losq (1985), Eun and Janakiramanan (1986), and Alexander et al. (1987). Errunza and Losq (1985) examine the effect of investment barriers in international capital markets and predict a "super risk premium" caused by segmented markets. Eun and Janakiramanan (1986) discuss the effect of legal restrictions on international investments. They employ a closed-form valuation model to show the influence of investment barriers on asset prices due to different restrictions on foreign investors. They argue that legal restrictions on foreign investors induce stock price differences between domestic and foreign investors. Namely, a higher stock price for domestic investors and a low price for foreign investors. Alexander et al. (1987) also provide a model to show the relation between asset pricing and dual listing, which discusses the effect of market segmentation on asset pricing.

The market segmentation theory implies that investment barriers could be reduced by cross-listing, which would result in higher stock valuation and a lower cost of equity

capital. The studies by Miller (1999) and Foerster and Karolyi (1999) examine the stock price reaction when foreign firms cross-list in the US, and they both find positive support for the market segmentation hypothesis. Miller (1999) investigates the market reaction to the cross-listing event for foreign firms listed in the US. The sample includes 181 firms from 35 countries that participated in the ADR[15] program during the period 1985-1995. The results show that there is a positive 1.15% average abnormal return for all foreign listed firms in the sample. The foreign listed firms from emerging markets also obtain higher abnormal returns than those firms from developed markets. Overall, the findings provide empirical support for the view that cross-listing can reduce barriers to capital flows, resulting in higher share prices for cross-listing firms. Foerster and Karolyi (1999) examine foreign stocks' weekly abnormal returns during the cross-listing event in the US using 153 foreign firms firstly listed on US stock exchanges from 1976 to 1992. Their results report that these foreign stocks earn significant abnormal returns, which is consistent with the theory that cross-listing can mitigate investment barriers. Unlike Miller (1999), they do not find a difference in abnormal returns (longer-run pattern) between firms from developed and firms from emerging markets. Also, it is shown that the cost of capital declines following cross-listing (i.e., Errunza and Miller, 2000). Errunza and Miller (2000) study the relation between market segmentation and the cost of capital in international stock markets by examining a sample of 126 ADR firms across 32 countries from 1985 to 1994. They find that there is a significantly decreased cost of capital for ADR firms in the US stock market. Their results suggest that market segmentation has a significant impact on the cost of capital.

The market segmentation theory has been challenged by Stulz (1999) and Karolyi (2012). Stulz (1999) was the first to question the market segmentation hypothesis and to propose an alternative explanation for cross-listing, known as the bonding hypothesis, which is related to corporate governance and agency problems, and which is discussed later. He focuses on the conflict between controlling shareholders and minority shareholders. He also points out that most of the empirical studies that support the market segmentation hypothesis are based on event-study methods that examine share-price reactions. Karolyi (2012) argues that many early empirical studies about the market segmentation

[15] It is known as an "American Depositary Receipt" which refers to the shares of a foreign company that are allowed to be traded in the US financial market.

hypothesis report mixed findings, and only two studies (i.e., Miller, 1999; Foerster and Karolyi, 1999) provide clear evidence in support of the market segmentation hypothesis.

1.2.1.2. Liquidity theory

Another motivation for cross-listing is to increase stock liquidity (Mittoo, 1992; Fanto and Karmel, 1997). Cross-listing increases the number of trading hours for a stock and the number of traders who are trading it, and it therefore facilitates more competition among traders. This, in turn, potentially reduces bid-ask spreads and stimulates trading in the home market. According to liquidity theory, cross-listing improves stock liquidity. The experience of Canadian firms that cross-list in the US supports this argument (e.g., Tinic and West, 1974; Mittoo, 1992; Foerster and Karolyi, 1998). An early study by Tinic and West (1974) finds evidence that Canadian stocks that cross-list in the US increase their liquidity compared to their domestically traded peers. Mittoo (1992) investigates Canadian firms listed on foreign stock exchanges (e.g., the US and UK) and argues that the primary motivation of a foreign listing is to access a more liquid stock market. By listing in a more liquid stock market firms can enhance their ability to raise capital. The positive net benefits of a foreign listing are driven by the levels of trading volume on a firm's stock on the foreign stock exchange. Foerster and Karolyi (1998) investigate changes in trading costs of stocks listed on the Toronto Stock Exchange (TSE) if these stocks also choose to list on a US stock exchange. They find that overall bid-offer spreads on the TSE decline significantly subsequent to the cross-listing. More importantly, they show that the changes in trading costs are associated with a significant shift in total trading volume (TSE and US). Namely, stocks experience a decline in trading costs as total trading volume (TSE and US) shifts to the US exchanges due to cross-listing. The findings show that TSE market makers provide a competitive response to the additional presence of US market makers for cross-listed stocks.

Stock liquidity is influenced by information lags (Chowdhry and Nanda, 1991) or inter-market information linkages (Domowitz et al., 1998). Chowdhry and Nanda (1991) develop theoretical models to show the relationship between multimarket trading and market liquidity. They investigate the issue of stocks trading on multiple stock markets simultaneously and find that information lags between different stock markets cause short-term disparities in stock prices. Informed traders have an opportunity to exploit their private information when they trade in different stock markets. Another word for

this is liquidity trading, which occurs when a large trade is split across stock markets. The proportion of liquidity trading depends on the number of large traders who can split their trades across different stock markets. Domowitz et al. (1998) examine the effect of cross-listing on the domestic market when a firm has cross-listed in overseas stock markets. Their theoretical model shows that inter-market information linkages (i.e., transparency) play an important role in determining the effect of cross-listing on the domestic market quality (e.g., the precision of public information, market depth, and bid-ask spreads). In particular, if inter-market price information is easy to obtain, cross-listing can improve the quality of the domestic market.

Liquidity theory is challenged by some studies (e.g., Werner and Kleidon, 1996; Halling et al., 2008; Silva and Chávez, 2008; Berkman and Nguyen, 2010). For example, Werner and Kleidon (1996) investigate intraday patterns of UK cross-listed stocks (both traded in the UK and US) and argue that each market follows the existing market transaction rules irrespective of whether a stock is also traded in other stock markets. They find that intraday patterns for UK cross-listed stocks (both traded in the UK and the US) are similar to those for non-cross-listed stocks. Other studies investigate the liquidity effects of cross-listing using samples of non-US firms from various countries. Halling et al. (2008) investigate the impact of cross-listing for a sample of 437 firms cross-listed in US markets from 34 different countries during the period from 1980 to 2001. They find that the fraction of trading is larger for those cross-listed firms from countries that are geographically close to the US and whose domestic capital markets are underdeveloped and have poor insider trading protection. Also, the trading volume of cross-listed firms decreases over time for developed market firms, while it increases for emerging market firms. Furthermore, two studies (i.e., Berkman and Nguyen, 2010; Silva and Chávez, 2008) find that the domestic liquidity of stocks does not improve after cross-listing. Berkman and Nguyen (2010) examine changes in domestic liquidity if a firm chooses to cross-list in the US. Their sample includes 277 firms across 30 countries during the period 1996-2005. They measure liquidity using intraday data from the domestic markets. They find that the unadjusted domestic liquidity of cross-listed firms is significantly reduced in the four years after cross-listing. However, they also find that there are dramatic improvements in liquidity for a matched sample of non-cross-listed firms. They offer no support for the view that cross-listing improves domestic liquidity. Similarly,

Silva and Chávez (2008) find that the domestic liquidity of stocks does not improve after cross-listing, using the data from Latin American markets.

1.2.1.3. Investor recognition theory

Investor recognition theory dates from the work of Merton (1987) who developed a capital asset pricing model under incomplete information to show the connection between a firm's investor base [16] and its valuation. Merton's model suggests that expanding a firm's investor base (also known as "the degree of investor recognition") could create a higher valuation. In the setting of cross-listing, the investor recognition hypothesis argues that the motivation of foreign firms to list in overseas stock markets is to broaden their investor base. Cross-listing is a channel that enables foreign firms to make their stocks available to more potential investors.

Investor recognition can be directly measured by the size of a firm's investor base (e.g., Foerster and Karolyi, 1999). Alternatively, it also can be measured by media coverage or by the number of financial analysts following a firm (e.g., Baker et al., 2002). Foerster and Karolyi (1999) investigate the effect of cross-listing for non-US firms by examining their stock price reaction. These non-US firms are listed on US stock exchanges as ADR programs between 1976 and 1992. Foerster and Karolyi (1999) argue that the stock price reaction around US cross-listings could partly be explained by the increase in the investor base. Baker et al. (2002) examine whether cross-listing increases firm visibility using a large sample of international firms listed in New York and London. They find that international firms increase their visibility following listing in the two stock markets, in which there are good analyst coverage and media coverage.

Investor recognition theory suggests that an increase in the investor base after cross-listing should lead to higher firm valuation (e.g., Lang et al., 2003; King and Segal, 2009). Lang et al. (2003) investigate whether cross-listing improves the information environment and firm value of non-US firms. They examine a large sample of ADR firms in the US stock market and find that cross-listed firms are associated with more analyst coverage and higher forecast accuracy than non-cross-listed firms. Also, their results

[16] The investor base is the number of investors (including individual investors and institutional investors) that have invested in a company.

report that the changes in analyst following occur around cross-listing, and the higher market valuation of cross-listed firms is associated with greater analyst coverage and higher forecast accuracy. They argue that the improved information environments of cross-listed firms have the effect of enhancing their market value. King and Segal (2009) investigate the effect of cross-listing in the US on Canadian firms' valuation over time. The results indicate that, for cross-listed firms with a single class of shares, they experience a permanent increase in valuation if they can keep investor recognition after cross-listing in the US. They find that these Canadian firms attract a high level of US institutional investor holdings, which contributes to higher firm valuation. Otherwise, if Canadian firms lose US institutional investor holdings, their firms' valuation returns to the pre-listing levels in two years. They argue that increased firm valuations for Canadian firms are associated with an expanded US investor base following a US listing.

1.2.1.4. The bonding theory

The bonding hypothesis was originally proposed to understand the benefits of cross-listing in US stock markets. Stulz (1999) and Coffee (1999) argue that firms list on a new stock market to bond themselves to better regulatory and capital market institutions. To overcome their governance problems, foreign firms subjectively choose to cross-list in the US stock market. These foreign firms improve their corporate governance by bonding to stronger legal and financial institutions and experience a listing premium. This listing premium is higher for those firms from countries with weak investor protection than for countries with good investor protection.

First, the bonding theory implies that the high level of investor protection in the US is an important consideration in the decision to cross-list. For example, Reese and Weisbach (2002) state that the main reason why non-US firms choose to list on US exchanges is that shareholder rights can be well protected due to US securities laws and regulations. They investigate whether non-US firms that list in the US improve their investor protection by examining a large sample of equity issues: over 1,000 foreign firms listed in the US stock markets and a control sample with over 17,000 purely domestic firms. They report that non-US firms from countries with poor investor protection are more likely to issue equity compared with non-US firms from countries with good investor protection. Their findings suggest that cross-listing in the US improves investor protection and eases access to external capital.

Second, the bonding theory also implies that cross-listing improves corporate governance and investor protection (e.g., Lel and Miller, 2008; Ayyagari and Doidge, 2010). Lel and Miller (2008) examine the bonding hypothesis by investigating the top management turnover of cross-listed firms. That is, they examine whether poorly performing CEOs are replaced, as foreign cross-listed firms should improve their internal corporate governance according to the bonding hypothesis. Their sample includes 19,091 firms from 47 countries during the period 1992 to 2003. They find that cross-listed firms from weak investor protection regimes are more likely to terminate poorly performing CEOs (based on the value of Tobin's Q) if they choose to list on a major US exchange than non-cross-listed firms. Overall, they argue that foreign firms improve corporate governance if they choose to cross-list in the US. Ayyagari and Doidge (2010) investigate whether cross-listings facilitate changes in ownership and control for foreign firms cross-listed in the US. Their sample includes 416 foreign firms from over 40 different countries between the period from 1990 to 2002. They find that about 75% of firms in their sample have a controlling shareholder before cross-listing. After cross-listing, for about 50% of firms in their sample, the controlling shareholders' voting rights decrease (i.e., an average decrease of 24% compared to peer firms). They find that cross-listing is associated with changes in ownership and control, and they argue that the influence of controlling shareholders on foreign firms becomes weaker once these firms have cross-listed in the US stock market.

Finally, cross-listing in the US should lead to higher firm valuation due to improved investor protection (e.g., Doidge et al., 2004; Doidge et al., 2009). Doidge et al. (2004) argue that high growth opportunities induce foreign firms to list in the US, although the controlling shareholders of these firms could lose certain private benefits. Their results show that foreign cross-listed firms in US stock markets have a higher valuation premium than their non-cross-listed peers from the same country, particularly those firms from countries with poor investor protection. They argue that the valuation premium is generated by bonding to the US legal system. Therefore, under a higher standard of corporate governance, the influence of controlling shareholders is limited. Similarly, Doidge et al. (2009) also find that there is a significant valuation premium for cross-listed firms on a US exchange (i.e., New York) over time. Their evidence that a New York Stock Exchange listing has unique governance benefits for foreign firms is consistent with the bonding theory. However, the benefits of cross-listing on firm valuation are

questioned by some studies (e.g., King and Segal, 2009; Sarkissian and Schill, 2009). King and Segal (2009) find that high firm valuations are not permanent for cross-listed firms using a sample of Canadian firms listed on US stock exchanges. Sarkissian and Schill (2009) also find that there are no permanent valuation gains arising from an overseas listing. Their findings are based on a global sample of foreign equity listings that are placed in 25 countries.

Another interesting question is whether cross-listings affect the cost of capital. Hail and Leuz (2009) find that foreign firms listed on US exchanges experience a significant reduction in their cost of capital in comparison to other types of US cross-listings (the OTC markets or private placements under Rule 144A[17]) based on a large sample of ADR firms from 45 countries during the period 1990 to 2005. They argue that the cost of capital reduction is significantly associated with growth expectations for ADR firms in the US stock market. The reduction in the cost of capital is more significant for ADR firms from countries with weaker investor protection. Doidge et al. (2004) state that foreign firms should be related to high growth opportunities if these firms cross-list in the US. In line with the view of Doidge et al. (2004), Hail and Leuz (2009) argue that the reduction in the cost of capital results from a US listing that is associated with higher standards of investor protection.

However, some studies challenge the bonding hypothesis, arguing that there is a risk that US laws will not be enforced against foreign firms listed in the US. That is, the SEC (Securities and Exchange Commission) and its enforcement powers are weak for foreign firms. Licht (2003) argues that there is no convincing evidence that has been found to support the bonding hypothesis. Using various methodologies, he demonstrates that the bonding role of cross-listing is exaggerated and that foreign firms are more likely to avoid US laws and regulations. He argues that the SEC is an inefficient body and that foreign listed firms in the US can easily obtain an exemption from SEC requirements (Coffee, 2002), which suggests that there are two securities regulation regimes in the US. Similarly, Siegel (2005) argues that US security laws lack effective enforcement for

[17] The term Rule 144A refers to a legal provision that amends restrictions placed on trades of privately placed securities. Rule 144A was introduced in 2012 and allows these investments to be traded among qualified institutional buyers (QIB). Rule 144A modifies restrictions for the purchase and sale of privately placed securities among qualified institutional buyers without the need for SEC registrations. Reese and Weisbach (2002) provide more details about the type of cross-listing under Rule 144A.

foreign listed firms. He examines the effect of US securities laws on preventing illegal asset tunnelling by insiders. Using Mexican firms as an example he finds that the SEC plays a mostly ineffective role in enforcing legal actions against these foreign listed firms in the US. Additionally, more evidence has been found to support the "reputational" bonding[18] than the "legal" bonding. For example, Siegel (2005) reveals that, compared to legal bonding, reputational bonding provides a better explanation for the many benefits obtained by foreign firms after cross-listing in the US. He argues that the effect of legal bonding on cross-listed firms has been overstated. Similarly, Burns et al. (2007) also find that the effect of legal bonding is exaggerated. However, their findings support the reputational bonding by examining analysts' coverage and institutional following.

1.2.1.5. Other theories about cross-listing

First, "information disclosure theory" suggests that cross-listing has an impact on firm-level information disclosure. As firms that cross-list need to meet the mandatory disclosure requirements of host exchanges, these additional disclosure requirements reduce information asymmetry between corporate managers and investors. Information disclosure theory implies that cross-listing improves a stock's information environment. For example, Khanna et al. (2004) find that foreign firms cross-listed in the US have significantly higher levels of disclosure compared to their non-cross-listed peers. They investigate the disclosure practices of foreign firms listed on US stock exchanges. Their sample includes 794 firms from 24 countries (in Asia, the Asia-Pacific region and Europe). They measure disclosure using a transparency and disclosure score published by Standard & Poor's. Also, increased disclosure after cross-listing has been shown to influence the market valuation of cross-listed firms. For example, Bailey et al. (2006) find that absolute abnormal returns and abnormal trading volume around earnings announcements significantly increase when non-US firms cross-list in the US. They argue that these stock market reactions are driven by changes in the individual firm's disclosure environment.

[18] The idea behind reputational bonding is that financial intermediaries play an important role in monitoring foreign firms and improving the information environment. Therefore, information asymmetry is reduced, better protecting minority shareholders' interests. The idea behind legal bonding is that a new legal environment improves cross-listed firms' corporate governance, which can provide better investor protection.

Furthermore, the public disclosure requirements of different stock exchanges influence the cross-listing decision. Huddart et al. (1999) develop a theoretical model to investigate whether the disclosure requirements of stock exchanges affect listing decisions and the allocation of liquidity across exchanges. They find that stock trading volume is concentrated on those exchanges with high disclosure requirements. Therefore, they argue that stock exchanges tend to compete for equity trading volume by increasing the disclosure levels. Liquidity traders prefer to trade on stock exchanges with higher disclosure requirements as corporate insiders lose their information advantage. Corporate insiders choose to cross-list on a stock exchange with higher disclosure requirements to increase their stock liquidity. Amira and Muzere (2011) investigate whether competition among stock exchanges affects stock exchanges' listing standards and firms' cross-listing decisions. They argue that controlling shareholders of cross-listed firms earn compensation from stock price appreciation, although they also lose some private benefits by listing on an exchange with higher listing standards. Especially, firms with high-growth opportunities are more likely to choose to list on stock exchanges with higher listing standards. They also empirically examine these assumptions and find evidence consistent with their arguments.

Second, the "proximity preference theory" explains the connection between geographic location and cross-listing, that is, why firms choose to list in a particular foreign destination market. More specifically, the proximity preference theory suggests that the choice of the host market for cross-listing is determined by the level of proximity between the home and host countries. For example, Sarkissian and Schill (2004) argue that proximity in terms of geography, economy, culture, and industry are the main factors that affect the overseas listing decision. A greater level of proximity increases the probability of cross-listing between two stock markets. Similarly, Dodd et al. (2015) state that cultural similarity is an important factor for cross-listed firms when they choose their destination markets. Empirical evidence on proximity preference theory is provided in two studies (Sarkissian and Schill, 2004; Dodd et al., 2015). Sarkissian and Schill (2004) investigate the market preferences of firms that list stocks abroad. They examine the distribution of overseas listings using country and firm-specific characteristics. Their sample is constructed from a comprehensive database of foreign listings across major world stock exchanges. They find that some proximity preference plays a key role in the choice of overseas listing, for example geographic, economic, cultural, and industrial proximity.

Their findings support some conventional motives for overseas listing. Dodd et al. (2015) investigate the effect of cultural distance between countries on the choice of destination markets for cross-listed firms. They argue that firms tend to cross-list in destination markets where there are greater cultural similarities with their home markets. On the one hand, investors prefer culturally familiar firms; on the other hand, managers avoid potential conflicts between potential investors and managers. They empirically examine the role of cultural distance using a large sample of firms from 45 home markets and 32 host markets. Their findings show that firms from developed countries are more likely to cross-list in markets with greater cultural similarities. The findings highlight the importance of culture in the cross-listing decision.

Third, "business strategy theory" can provide an explanation for firms choosing to list abroad. Survey evidence (i.e., Fanto and Karmel, 1997; Bancel and Mittoo, 2001) indicates that some foreign listings may be driven primarily by business rather than financial considerations. On the one hand, business strategy theory implies that the cross-listing decision is related to firm-specific factors (e.g., Pagano et al., 2001; Pagano et al., 2002). Pagano et al. (2001) find that some firms are more likely to cross-list in the same stock market in which their industry peers have already cross-listed, which suggests that cross-listing decisions could be driven by a firm's business strategy. Pagano et al. (2002) investigate the aggregate listing trends of firms and also examine these firms' prelisting characteristics and postlisting performance. They find that European firms that pursue cross-listing are large and newly privatized. Among them, high-tech and export-oriented firms are attracted by US stock exchanges. They argue that the one-way flow of cross-listings from Europe to the US shows that these firms are motivated to expand their sales abroad, especially those belonging to high-tech industries. The US stock market provides an opportunity for these firms that pursue a strategy of rapid, foreign equity-funded expansion. On the other hand, business strategy theory also implies that the valuation of cross-listed firms is determined by firm-specific factors. For example, Mittoo (2003) examines the valuation effect of US listing on Canadian firms and finds that industry factors may affect long-run performance. The results show that the long-run performance of cross-listed Canadian firms on US stock exchanges is significantly different from their short-run performance. They find that the short-run abnormal returns of these cross-listed firms are determined by increased liquidity after cross-listing while industry-specific factors influence these cross-listed firms' long-run performance.

1.2.2. Cross-listing and the managerial learning hypothesis

The managerial learning hypothesis is based upon the proposition that managers can learn from stock market prices when making investments and other decisions (e.g., to raise finance in an IPO). Bond et al. (2012) review the literature about the informational role of market prices and their real effect on financial markets. They point out that the information feedback from market prices helps us to understand various market phenomena. Also, if stock prices better reflect information this is helpful for the efficiency of investment decision making. Dow and Gorton (1997) argue that the stock market plays an indirect role in guiding managers' investment decisions by communicating two categories of information, namely investment opportunities and managers' former investment decisions. There is a growing literature supporting the hypothesis that corporate managers make their decisions by relying in part on the information conveyed by their firms' stock prices (e.g., Luo, 2005; Chen et al., 2007; Bakke and Whited, 2010). An important example of managers learning from stock prices is in the evaluation of M&A opportunities. For example, Luo (2005) investigates whether managers capture information from stock prices to make investment decisions during the M&A announcement period. The findings suggest that managers appear to learn from the market reaction (i.e., the cumulative abnormal returns) to M&A announcements, in deciding whether to consummate an M&A deal later, thus supporting the managerial learning hypothesis. On the other hand, the sensitivity of investment to stock price (or Tobin's Q) is also employed to examine the managerial learning hypothesis. For example, Chen et al. (2007) examine the relation between the amount of private information in stock prices and the sensitivity of investment to stock prices. They find that the amount of private information has a significant positive impact on the sensitivity of investment to stock prices, using US stock market data. Their results suggest that managers obtain private information from stock prices and use this information to make investment decisions. Bakke and Whited (2010) also find that managers extract private information from stock prices to make investment decisions, which is consistent with the findings of Luo (2005) and Chen et al. (2007).

The managerial learning hypothesis has been extended to cross-listing studies. Foucault and Gehrig (2008) develop a theory based on a learning channel whereby cross-listing improves information flow from the stock market to cross-listed firms. They propose their theory based on studies that show a connection between cross-listing and the

information environment (e.g., Lang et al., 2003; Bailey et al., 2006; Fernandes and Ferreira, 2008). Lang et al. (2003) argue that cross-listing has an impact on enhancing firm value by improving firms' information environments. Bailey et al. (2006) find that there is a greater absolute abnormal return and trading volume around the earnings announcement once a non-US firm cross-list in the US stock market. They state that these market reactions are driven by changes in a firm's disclosure environment. Fernandes and Ferreira (2008) investigate whether cross-listing improves the information environment, in their examination of non-US firms listed in the US. Specifically, they examine the effect of cross-listing on the stock price informativeness of non-US firms, which is measured as the firm-specific stock return variation.[19] They argue that cross-listing has a different impact on the stock price informativeness of non-US firms depending upon whether or not they are classified as developed or emerging market firms.

A new explanation for cross-listing based on the informational channel is developed by Foucault and Gehrig (2008). Their theory suggests that cross-listing improves managers' ability to extract precise information from their firms' stock prices about the value of their growth opportunities. As a result, managers make more informed investment decisions as cross-listing enhances stock price informativeness. This improved information channel that arises from cross-listing enhances firm value because it leads managers to take advantage of their growth opportunities and so make value-enhancing investments. The theory implies that the sensitivity of investment to stock prices is larger for cross-listed firms. Foucault and Frésard (2012) examine the testable implications of the managerial learning hypothesis proposed by Foucault and Gehrig (2008). They find that cross-listed firms have a higher investment-to-price sensitivity in comparison to non-cross-listed firms, which is consistent with the managerial learning hypothesis espoused by Foucault and Gehrig (2008). They point out that the higher investment-to-price sensitivity of cross-listed firms is not primarily driven by improved governance, disclosure, or access to capital in the US. Instead, they argue that it is mainly driven by more informative stock prices after cross-listing, and that a US listing enables managers to obtain precise information from the stock market.

[19] They follow the method of Morck et al. (2000) to measure stock price informativeness, which is measured by the firm-specific stock return variation.

1.2.3. Foreign listing studies about Chinese firms

First, Chinese firms usually choose to list on various stock exchanges across the world. One branch of the literature tries to identify the motivations for Chinese firms' foreign listings and investigates the different influences on the foreign listings of Chinese firms. These studies indicate that the geography of foreign listings is important. For example, different stock exchanges provide different benefits for Chinese firms (e.g., Yang and Lau, 2006). Yang and Lau (2006) find some benefits of a Hong Kong listing for Chinese firms using a sample of 237 Chinese firms listed on various stock exchanges outside mainland China. Beyond geographical proximity, they identify two additional benefits of a Hong Kong listing. First, Hong Kong-listed Chinese firms enjoy a better information environment than those Chinese firms that list solely in the US. Second, Hong Kong-listed Chinese firms are less financially constrained, as it is easy to obtain external financing from the Hong Kong capital market. Overall, they argue that different stock markets provide different benefits for foreign firms, which influences the choice of listing location.

Furthermore, Chinese firms listed on different stock exchanges have different characteristics (e.g., Zhang and King, 2010; Pan and Brooker, 2014; Li, 2019). Zhang and King (2010) find that Chinese firms that issued ADRs have some common characteristics: in general, they are large, have low leverage, are profitable, have high growth, and are high-tech firms. Chinese firms that are listed in Hong Kong via an IPO have similar characteristics to the Chinese firms that issued ADRs. However, Chinese firms listed in Singapore via IPOs have different characteristics: they are small, high leverage, superior profitability, high growth, and non-high-tech firms. Their findings suggest that the geography of overseas listings is important. Pan and Brooker (2014) investigate the development and geography of Chinese firms' overseas listings on international stock exchanges using a unique dataset. They find that the developed stock markets, such as Hong Kong, New York, Singapore, and London (the major destinations for Chinese firms) are firstly chosen by larger Chinese firms, although other stock markets, such as Germany, South Korea, Australia, and Canada also attract Chinese firms (emerging destinations for Chinese firms). They also find that Chinese firms from more developed coastal Chinese regions are more likely to list overseas than Chinese firms from other regions. They argue that two main factors (i.e., government policy orientation and proximity preferences) affect the geography of Chinese firms' overseas listings. Li

(2019) investigates the motivations and consequences of foreign listing using a Chinese sample and examines whether there is a difference between direct overseas listing and cross-listing. They find that Chinese high-tech firms prefer to seek a direct overseas listing in the US stock market. Chinese firms with state ownership tend to directly list in Hong Kong rather than in the US. The higher is state ownership concentration, the greater is the likelihood that firms directly list in Hong Kong.

A very important characteristic of the Chinese economy is the high level of government intervention. The foreign listings of Chinese state-owned firms are influenced by the Chinese government. Two studies try to explain why Chinese state-owned firms list abroad. Hung et al. (2012) argue that managers of politically connected firms choose to list their firms in overseas stock markets for their private benefits, while Sun et al. (2013) state that overseas listing is a policy tool for the Chinese government. Hung et al. (2012) explore why Chinese state-owned firms with strong political connections prefer to list their stocks abroad. Their sample includes a large number of Chinese firms listed on overseas stock exchanges and two domestic stock exchanges over the period from 1992 to 2005. They find that Chinese politically connected firms experience worse firm performance after an overseas listing compared to Chinese non-politically connected firms. They argue that managers of politically connected firms choose to list their firms in overseas stock markets for their own private benefits. For example, managers are more likely to be covered by political media or to be promoted to a senior government position after an overseas listing. Sun et al. (2013) investigate why the Chinese government chooses to list its state-owned firms in the Hong Kong stock market given that it has a higher listing cost for share issue privatization (SIP) than mainland stock markets. They argue that the Chinese government lists its state-owned firms in overseas markets to maintain the order of the domestic market, because the domestic market is not as well developed and has a limited capacity to absorb large-scale SIP activity. These state-owned firms may also receive benefits from listing on developed overseas markets that have better accounting, governance, and legal standards. To examine these arguments, they employ a “market order” hypothesis and a governance hypothesis to explain the phenomenon of Chinese state-owned firms listing in Hong Kong. Overall, they confirm that overseas listing is a policy tool for the Chinese government.

A study by Busaba et al. (2015) argues that the motivation of Chinese firms' foreign listing is to obtain enhanced visibility and prestige from the foreign listing. An interesting phenomenon is reported by the authors, who investigate Chinese firms that firstly list abroad and then return to list in the domestic market. They find that these Chinese firms experience poorer stock and operating performance after returning to the list in the domestic market compared to their purely domestic listed peers. But these Chinese firms obtain more funds by stock issuance, with lower direct flotation costs. They propose a new theory of cross-listing called the "dressing-up-for-premium" theory to explain this phenomenon. Firms in less-developed markets firstly list abroad to take advantage of the enhanced visibility and prestige from the foreign listing, before returning to list in their domestic markets. According to the theory, these "returned firms" obtain benefits from the local stock market, for example, inflated stock prices and favourable terms for listing.

Second, another branch of the literature examines the bonding theory using Chinese firms listed on various stock exchanges. However, these studies show mixed findings regarding the bonding theory. Some studies show support for the bonding hypothesis (e.g., Luo et al., 2012; Doukas and Wang, 2014; Huang et al., 2016) while other studies do not show support for the bonding hypothesis (e.g., Ke et al., 2012, Li, 2019; Filip et al., 2020, Liu and Li, 2020).

As far as support for the bonding hypothesis is concerned, Luo et al. (2012) investigate the post-listing performance of Chinese stocks in the US stock market from 1993 to 2010. They compare Chinese ADRs in the US across two groups: the cross-listing ADRs and the single-listing ADRs. The cross-listing ADRs include Chinese firms listed in the US as well as in China, while the single-listing ADRs are only listed in the US. They find that the cross-listing ADRs have better long-run stock performance compared to the single-listing ADRs. They argue that stringent listing requirements in the US may improve Chinese firms' corporate governance and operating performance. Doukas and Wang (2014) examine the bonding hypothesis using a Chinese dataset and focus on stock market liberalization reforms in China. Their sample includes a panel sample of Chinese firms from 1998 to 2006, which includes the period of stock market liberalization reforms conducted in 2001 and 2002. They find that Chinese cross-listed firms experience better earnings quality and higher valuation in comparison to those domestic-listed firms. Also, they find that cross-listing improves the stock price informativeness of Chinese firms.

Furthermore, while their findings show support for the bonding hypothesis, they also argue that the effect of cross-listing is mitigated after the stock market liberalization reforms. Huang et al. (2016) examine the bonding hypothesis using intraday trading data for Chinese firms cross-listed in the Hong Kong stock market. They find that Chinese firms cross-listed in Hong Kong improve their stock liquidity and have lower transaction costs and greater information trading content compared to their purely domestically listed peers. They confirm that their findings remain significant after controlling for other factors that affect liquidity. Their findings provide additional evidence in support of the bonding hypothesis.

Regarding studies that challenge the bonding hypothesis, Ke et al. (2012) argue that the bonding hypothesis is only applicable to some Chinese state-controlled firms listed in Hong Kong. Li (2019) and Filip et al. (2020) both report findings that do not support the bonding hypothesis. Additionally, Liu and Li (2020) argue that the bonding theory is only applied to certain listing locations for Chinese firms. Ke et al. (2012) find that the cash pay-for-performance sensitivity and the level of long-term managerial incentives are higher for Chinese state-controlled firms (Red chips) in comparison to other Chinese state-controlled firms (A-share and H-share firms), which is consistent with the bonding hypothesis. That is, the impact of Chinese institutional forces is weak only for Chinese state-controlled firms (Red chips). Li (2019) investigates the motivations and consequences of overseas listing using a Chinese sample and finds that Chinese firms' overseas listing does not support the bonding hypothesis. The finding is consistent with Doidge et al. (2010), that is, foreign firms with high expected private control benefits avoid directly listing in the US. Filip et al. (2020) investigate whether a foreign listing can reduce corporate malfeasance (or misbehaviour) for Chinese privately-owned firms. They focus on Chinese privately-owned firms (known as P chips) listed on the Stock Exchange of Hong Kong (SEHK). They find that these Chinese privately-owned firms listed in Hong Kong are more likely to engage in corporate misbehaviour (e.g., earnings management) in comparison to local Hong Kong firms. They argue that the jurisdictional enforcement of Hong Kong regulators on Chinese privately-owned firms is weak, which is consistent with the difficulty of ensuring cross-jurisdictional enforcement (e.g., Duarte et al., 2014). Liu and Li (2020) point out that the effect of bonding on Chinese firms should consider the listing location. They only find supportive evidence for the bonding theory for Chinese firms listed in the US, while there is no supportive evidence for other

stock markets (i.e., Hong Kong, Singapore, and London). They argue that the listing location may influence the validity of bonding theory, which suggests that bonding theory is limited as it may only apply to certain listing locations.

Third, two studies address the topic of how information influences Chinese firms listed in both Hong Kong and their domestic stock market. Li et al. (2015) investigate whether cross-listing has an impact on firm-specific information by examining 60 Chinese cross-listed firms that are traded as both A-shares in mainland China and H-shares in Hong Kong. They find that the same firms traded as H-shares provide more firm-specific information to foreign investors than those firms traded as A-shares provide to domestic investors. They argue that foreign investors' ability to use information plays an important role in firm-specific information disclosure for Chinese cross-listed firms in Hong Kong. Kot and Tam (2016) investigate whether the information and trading environments of Chinese firms (H-shares) listed in the Hong Kong stock market change if they return to cross-list in their domestic stock market (i.e., the A-share market). They find that the stock prices of H-share firms become less informative after reverse cross-listing in mainland China.

1.3. Data and research methods

The foreign listed sample for this thesis is selected from Chinese firms traded on the Stock Exchange of Hong Kong (SEHK). The thesis only investigates Chinese firms traded on the Main Board of the SEHK. Chinese firms traded on the Growth Enterprise Market (SEHK stock code: 08000-08999) are excluded from the foreign listed sample. The Main Board of SEHK is chosen because it is the main market of SEHK. Also, the firms traded on the Main Board of the SEHK need to meet higher listing standards than those on the Growth Enterprise Market. The foreign listed sample includes Chinese firms on the Main Board of the SEHK during the period from 01.2001 to 12.2015 that are covered by DataStream. There are three categories of Chinese firms on the Main Board of the SEHK (i.e., H-share[20], Red chip[21] and P chip[22] firms). The domestic listed sample is selected from Chinese firms domestically traded on the Shanghai Stock Exchange (SSE)

[20] The "H-share" firms are officially disclosed by the Stock Exchange of Hong Kong.
[21] The "Red chip" firms are officially disclosed by the Stock Exchange of Hong Kong.
[22] There is no official definition of "P chip" firms by the Stock Exchange of Hong Kong. The author uses two key criteria to identify a P chip. In addition, the author also obtained P chip information from the "Russell Global Index membership list" to confirm whether a firm is a P chip.

or the Shenzhen Stock Exchange (SZSE) as A-shares from 01.2001 to 12.2015 that are covered by DataStream. The domestically listed Chinese firms are employed as a control sample in the thesis.

Chapter 4 and Chapter 5 employ a sample of firms engaged in M&A, which includes acquisitions made by Chinese listed firms (foreign listed sample and domestic listed sample) across 15 years (from 01.01.2001 to 31.12.2015). The acquisitions are reported in the database S&P Capital IQ. These Chinese bidders are domestic listed firms (i.e., A-share) on the Shanghai Stock Exchange (SSE) or the Shenzhen Stock Exchange (SZSE) and Hong Kong-listed firms (i.e., H-share, Red chip and P chip) on the Main Board of the SEHK.

The thesis uses quantitative research methods to analyse panel data. Chapter 3 employs ordinary least squares (OLS) regression including fixed effects, and also logit regression, to examine hypotheses. To check the robustness of the results, Chapter 3 employs the Heckman two-stage estimation to correct for any self-selection bias.[23] Chapter 4 uses the propensity score matching method to reduce the sample selection bias and find the matched sample, and it employs logit regression, including fixed effects, to examine hypotheses. Chapter 4 also employs the Heckman two-stage estimation to check the robustness of the results. Chapter 5 mainly uses the logit regression, including fixed effects, to examine hypotheses. Chapter 5 also employs the Heckman two-stage estimation to mitigate the potential issues of self-selection. Chapter 4 and Chapter 5 both use an event study method to compute cumulative abnormal returns (CARs) for bidders during the M&A announcement period.

1.4. Findings and contributions

The findings are reported in three empirical studies (i.e., Chapter 3, Chapter 4, and Chapter 5 of the thesis). Chapter 3 (the first study) investigates whether a Hong Kong listing improves Chinese firms' investment efficiency. Firstly, this chapter examines whether Hong Kong-listed Chinese firms have a higher sensitivity of investment to investment opportunities (Tobin's Q) compared with their domestically listed peers.

[23] Self-selection bias may arise when the treatment group and control group are not randomly from the same population.

Secondly, the chapter examines whether Hong Kong-listed Chinese firms are associated with underinvestment or overinvestment compared with their domestically listed peers. Using a large sample of Chinese listed firms from 2001 to 2015, the findings show that Hong Kong-listed Chinese firms have a higher investment-to-Q sensitivity compared with their domestically listed peers, which suggests that a Hong Kong listing improves Chinese firms' investment efficiency. However, it is discovered that only P chip firms (i.e., privately-owned firms) increase their investment efficiency after a Hong Kong listing. Stein (2003) argues that information asymmetry and agency problems are two main frictions that affect firm-level investment efficiency. These findings imply that a Hong Kong listing has an impact on information asymmetry and agency problems, which leads to more efficient investment. Also, the findings show that Hong Kong-listed Chinese firms are not associated with underinvestment compared to their domestically listed peers. As underinvestment is caused by information asymmetry between managers and investors, according to Myers and Majluf (1984), this suggests that information asymmetry between managers and investors could therefore be mitigated by a Hong Kong listing.

Chapter 4 (the second study) examines the acquisition behaviour of Chinese firms and whether a Hong Kong listing makes a difference. This chapter firstly investigates whether a Hong Kong listing increases the likelihood of acquisitions by Hong Kong-listed Chinese firms compared with their domestically listed peers. The chapter employs a propensity score matching method to select a firm sample that includes Hong Kong-listed and domestically listed firms during the period between 2001-2015. The first finding shows that Hong Kong-listed Chinese firms have a lower likelihood of acquiring other firms compared to their domestically listed peers (i.e., no overinvestment). Secondly, the chapter examines whether Hong Kong-listed Chinese firms make successful acquisitions. The M&A sample includes 2,591 acquisitions by Chinese listed firms (including Hong Kong-listed and domestically listed) during the period from 2001 to 2015. The second finding suggests that a Hong Kong listing enables Chinese firms to make more successful acquisitions than their domestically listed peers. The first finding shows that Hong Kong-listed Chinese firms are less likely to make acquisitions (i.e., do not overinvestment) and the second finding shows that they are also more likely to make successful acquisitions, compared with their domestically listed peers. Taken together, these findings suggest that a Hong Kong listing induces managers that avoid overinvesting and increase the

probability of successful acquisitions, and therefore effective investment decision-making. This implies that the agency costs of Chinese firms are mitigated after a Hong Kong listing. Additionally, some M&A deal characteristics (i.e., all cash payments, private targets and cross-border deals) play an important role in Hong Kong-listed Chinese firms making successful acquisition deals.

Chapter 5 (the third study) firstly investigates the payment choice of Hong Kong-listed Chinese firms in acquisitions compared to the payment choice of their domestically listed peers. Secondly, this chapter examines whether an acquirer's excess cash can affect the choice of payment method in acquisitions. Finally, the chapter examines the acquirer's abnormal return during the M&A announcement period. The M&A sample includes 2,047 completed acquisitions made by Chinese listed firms during the period between 2001 and 2015. The findings show that Hong Kong-listed Chinese firms are more likely to choose all-cash payments in acquisitions compared to their domestically listed peers. However, all-cash payments are less used in cross-border deals by Hong Kong-listed Chinese firms. Specifically, all-cash payments are popularly used by non-P chips firms (H-shares and Red chips) in large acquisitions while P chips firms are more likely to increase equity payments in large acquisitions. This indicates that the different categories of acquiring firms show different financing behaviour when making acquisitions. Cash payments are related to high agency risk, while equity payments are related to low agency risk (Shleifer and Vishny, 1986; Stulz, 1988). Therefore, the agency costs of Hong Kong-listed Chinese firms are reduced only for P chip firms or in cross-border deals. Moreover, the findings suggest that the high levels of excess cash held by Hong Kong-listed Chinese firms may influence their choice of all-cash payments in acquisitions, which is consistent with the pecking order theory (Myers, 1984). In addition, the findings show that Hong Kong-listed Chinese firms are found to be more likely to experience positive abnormal returns when they use all-cash payments in acquisitions, compared to their domestically listed peers. This implies that agency costs in Hong Kong-listed Chinese firms are reduced when using the all-cash payment method (high agency risk).

The thesis contributes to the literature in several ways. First, the thesis makes a contribution to knowledge about privately-owned firms. Chinese privately-owned firms are more likely to exhibit market economy-like behaviour because they are less influenced by the Chinese government. In academic studies, Chinese privately-owned

firms have attracted less attention. The limited studies that address Chinese privately-owned firms (e.g., Sun and Tong, 2003; Fan et al., 2007) mainly focus on China's partially privatized firms (i.e., those firms that were previously state-owned firms). The thesis extends this work by examining the consequences of Chinese privately-owned firms' foreign listings. That is, P chips firms that list on the SEHK. The inclusion of these firms in the sample will help us to understand more about the behaviour of privately-owned firms in China.

Second, the thesis provides a comprehensive investigation of Chinese firms listed on the SEHK by including all three categories of Chinese firms (i.e., H-share, Red chip, and P chip). Most of the existing literature (e.g., Sun et al., 2013 and Li et al., 2015) only focuses on H-shares listed on the SEHK when investigating Hong Kong listings. Ke et al. (2012) choose both H-shares and Red chips on the SEHK in their study and find that the effect of a Hong Kong listing on H-shares and Red chips is different. These studies only choose H-shares and Red chips and the size of their samples is small. More importantly, P chip firms that make up a large proportion of Chinese firms on the SEHK are neglected. Although Filip et al. (2020) is the first study to identify P chips from all listed firms on the SEHK, they only investigate P chips in their study. Therefore, the thesis employs three categories of Chinese firms on the SEHK (i.e., H-share, Red chip, and P chip) within the sample, which can then identify the different effects of a Hong Kong listing on these different types of Chinese firms. As the motivation for each category of Chinese firm (i.e., H-share, Red chip, and P chip) choosing to list on the SEHK may be different, the inclusion of all three categories of firms in the sample helps us to understand more differences in behaviour. Furthermore, the sample selection method employed in this thesis is different to that used by Filip et al. (2020).

Third, the thesis contributes to the growing literature on Chinese firms' Hong Kong listings. Ke et al. (2012) examine both H-shares and Red chips listed in Hong Kong and find that the bonding hypothesis is only applicable to Red chips; that is, the effect of a Hong Kong listing on H-shares and Red chips is different. This thesis extends the sample size beyond that used by Ke et al. (2012) and finds that the effect of a Hong Kong listing on P chips and non-P chips (i.e., H-shares and Red chips) is different. For example, in Chapter 3 it is reported that only P chip firms increase their investment efficiency after a Hong Kong listing, and there is no evidence that a Hong Kong listing improves the

investment efficiency of non-P chips (i.e., H-shares and Red chips). In Chapter 5 it is reported that P chips are more likely to increase equity as a payment method in large M&A transactions. However, non-P chips (i.e., H-shares and Red chips) exhibit different behaviour (i.e., the use of all-cash) in their choice of payment methods for large M&A transactions.

Fourth, the thesis adds to the literature about Chinese firms' investment efficiency (e.g., Chen et al., 2011; Chen et al, 2018; Wang et al., 2020). These studies address different factors that may affect Chinese firms' investment efficiency. Chen et al. (2011) examine the relation between investment efficiency and government intervention. Chen et al. (2018) focus on corporate philanthropy and investment efficiency. Wang et al. (2020) examine the effect of bank ownership on Chinese firms' investment efficiency. The thesis addresses the effect of a Hong Kong listing (i.e., a foreign listing) on Chinese firms' investment efficiency. Chapter 3 employs a unique sample of Chinese firms listed on the SEHK and finds that a Hong Kong listing improves investment efficiency. Specifically, Chapter 3 finds that only one category of Chinese firms, privately-owned P chip firms, increases their investment efficiency after a Hong Kong listing.

Fifth, to the best of my knowledge, the thesis is the first study that includes three categories of Chinese firms on the SEHK (i.e., H-share, Red chip, and P chip) to examine whether Hong Kong-listed Chinese firms are more likely to attempt acquisitions, and whether Hong Kong-listed Chinese firms are more likely to make successful acquisitions. In Chapter 4 it is reported that Hong Kong-listed Chinese firms are less likely to attempt acquisitions compared with their domestically listed peers (using China data), which is different from the finding of Ghosh and He (2015) who, using a large sample of foreign firms listed on US stock exchanges, report that cross-listing has a significant positive influence on the number of M&As. Moreover, it is also reported in Chapter 4 that a Hong Kong listing enables Chinese firms to make more successful acquisitions than their domestically listed peers. Additionally, it is reported in Chapter 4 that Hong Kong-listed Chinese firms are more likely to make successful acquisition deals compared to their domestically listed peers if the target firm is private or the payment method is all-cash.

Six, the thesis adds to the literature about the choice of payment method in M&As. The choice of payment method is an aspect of the M&A process that is not fully understood

in the existing literature (Faccio and Masulis, 2005). Previous literature shows that the choice of payment method in M&As is driven by various firm-level factors. Recently, some studies (e.g., Tolmunen and Torstila, 2005; Burns et al., 2007; Kumar and Ramchand, 2008) have examined the effect of cross-listing on the choice of payment method in M&As (i.e., cash or equity). However, the evidence about whether cross-listing enhances the proportion of equity financing in M&A deals is mixed. Tolmunen and Torstila (2005) find that European firms listed on US stock exchanges are more likely to increase the proportion of equity as a payment method after cross-listing. However, Burns et al. (2007) indicate that cross-listed firms in the US rarely use equity as a payment method in acquiring US targets compared with domestic US acquirers. Chapter 5 investigates the payment method used by Hong Kong-listed Chinese firms involved in acquisitions, to examine whether Chinese firms change their financing behaviour when listing in a more developed stock market (i.e., Hong Kong). In Chapter 5 it is reported that Hong Kong-listed Chinese firms are more likely to use all-cash payments in acquisitions compared with their domestically listed peers. Equity is only chosen as the "acquisition currency" by Hong Kong-listed Chinese firms in cross-border M&A deals. These findings imply that equity is less favoured in acquisitions by Hong Kong-listed Chinese firms.

1.5. Structure of the thesis

This thesis is organized as follows. The thesis contains three empirical studies, the results of which are reported in Chapters 3 to Chapter 5. Chapter 2 provides background information about China's stock market and the methodology used for the sample selection. Chapter 3 (the first study) investigates whether a Hong Kong listing improves Chinese firms' investment efficiency. Chapter 4 (the second study) examines whether a Hong Kong listing influences Chinese firms' acquisition behaviour. Chapter 5 (the third study) investigates the payment choice of Hong Kong-listed Chinese firms involved in acquisitions. Chapter 6 presents the conclusions and limitations of the thesis and suggests directions for further research.

Chapter 2 Institutional Background and the Chinese Firm Sample

2.1. Introduction

This chapter firstly provides an overview of China's stock market, especially the A-share stock market. Then, it describes the motivation and benefits of overseas listing for Chinese firms, as well as the development of overseas listing since the 1990s. Also, it presents the benefits of a Hong Kong listing compared with a domestic listing. Finally, it introduces the methodology used for the sample selection in the thesis. That is, how Chinese firms listed in Hong Kong (i.e., H-share, Red chip, and P chip firms) are identified.

2.2. China's stock market

2.2.1. The development of China's stock market

China's stock market developed since the 1990s as a way to modernize China's economy. There are two stock exchanges in mainland China. The Shanghai Stock Exchange (SSE) was re-established on November 26th, 1990 and is the largest stock exchange in China. The Shenzhen Stock Exchange (SZSE) was established on 1st December, 1990 and is the third-largest one in China. The two exchanges are non-profit organizations directly administered by the China Securities Regulatory Commission (CSRC). The CSRC is a central level institution that regulates the securities industry in China. In mainland China, there are different levels of stock markets to meet the demands of various firms: the A-share market, the B-share market, the EME board and the ChiNext board. The A-share market is the most important one and it includes many high-quality firms. The A-share market was created for domestic investors while the B-share market was initially designed for foreign investors by the Chinese government. The issuance of B-shares stopped when the Qualified Foreign Institutional Investor (QFII) [24] program was introduced in 2002 (Carpenter et al., 2021). The EME board (established in 2004) and the ChiNext board (established in 2009) are supplementary markets for small and growth firms.

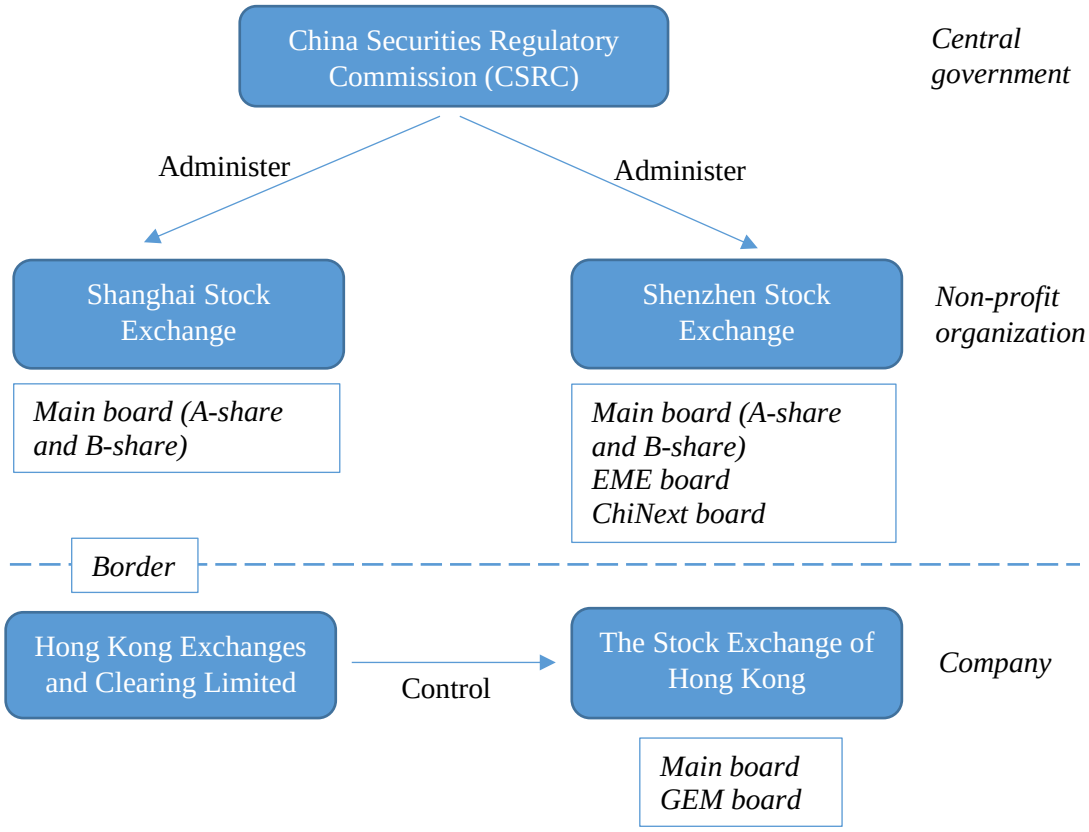
[24] The Qualified Foreign Institutional Investor program is designed for foreign investors to invest in the RMB-denominated "A-share" stock market in mainland China.

In addition, the Stock Exchange of Hong Kong (SEHK) became an important part of China's stock market after 1997. Hong Kong is a special administrative region of China and follows the common law legal tradition according to the "one country, two systems[25]" principle. Even after the 1997 handover of Hong Kong to China, a Hong Kong listing was still officially considered as a foreign listing by the CSRC. The Stock Exchange of Hong Kong (SEHK) is a wholly-owned subsidiary of Hong Kong Exchanges and Clearing Limited (HKEX). Two markets constitute the Stock Exchange of Hong Kong: the Main Board and the Growth Enterprise Market (GEM). The Growth Enterprise Market (GEM) was established in 1999 for growth firms that do not fulfil the criteria for listing on the Main Board. Unlike the two stock exchanges in mainland China, the Stock Exchange of Hong Kong (SEHK) is a highly international stock market and an open market for global investors. Figure 2.1 presents the structure of China's stock market.

[25] "One country, two systems" is a constitutional principle of China describing the governance of Hong Kong and Macau. These regions were allowed to retain their own economic and administrative systems after 1997 and 1999.

Figure 2.1 China's stock market structure

This figure presents the differences between the different elements of China's stock market. The Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) are administered by the China Securities Regulatory Commission (CSRC). The Stock Exchange of Hong Kong (SEHK) is owned by Hong Kong Exchanges and Clearing Limited (HKEX). Source: created by the author.



2.2.2. Difficult IPO road in the A-share market

Although there are different stock markets (i.e., A-share, B-share, EME board and ChiNext board) in mainland China, the A-share market is the most important one. Unlike other countries, the A-share market does not reflect real economic performance because the stock market is affected by the Chinese central government to a large extent. The Chinese government can affect the flow of IPOs on its stock markets to achieve its policy goals.[26] Allen et.al (2005) argue that mainland Chinese stock markets do not reflect the true values of listed firms. In mainland China, the stock market is not the main channel

[26] Gabriel Wildau and Yizhen Jia. (2017) China keeps IPOs on tight leash to protect policy goals. *Financial Times*, accessed on 17 December, 2017 at: https://www.ft.com/content/7e4d0e3a-e176-11e7-a8a4-0a1e63a52f9c

for capital allocation. In contrast, the state-owned banking system dominates capital allocation.[27]

Due to the special administration structure of China's stock market, IPO approval is ultimately controlled by the CSRC. This causes approval inefficiency and IPO discrimination. A long IPO queue is not news in the A-share market[28] as the Chinese government influences the IPO application speed. Political forces also play an important role in the IPO approval mechanism. Chen et al. (2017) report that politically connected underwriters (investment banks) effectively increase the IPO application success rate of Chinese firms. Piotroski and Zhang (2014) argue that Chinese politicians have an impact on the IPO decision before impending political promotion events. The IPO quota system[29] played an important role in IPO applications in the A-share market from 1993 to 2001. Although a market-based mechanism has been developed to replace the quota system, the A-share market is not open to all potential applicants. Due to the existence of political forces, privately-owned firms usually encounter discrimination in IPO applications compared with state-owned peers. Overall, the IPO road in the A-share market is long and full of uncertainty.

2.3. Overseas listing of Chinese firms

2.3.1. Benefits of overseas listing

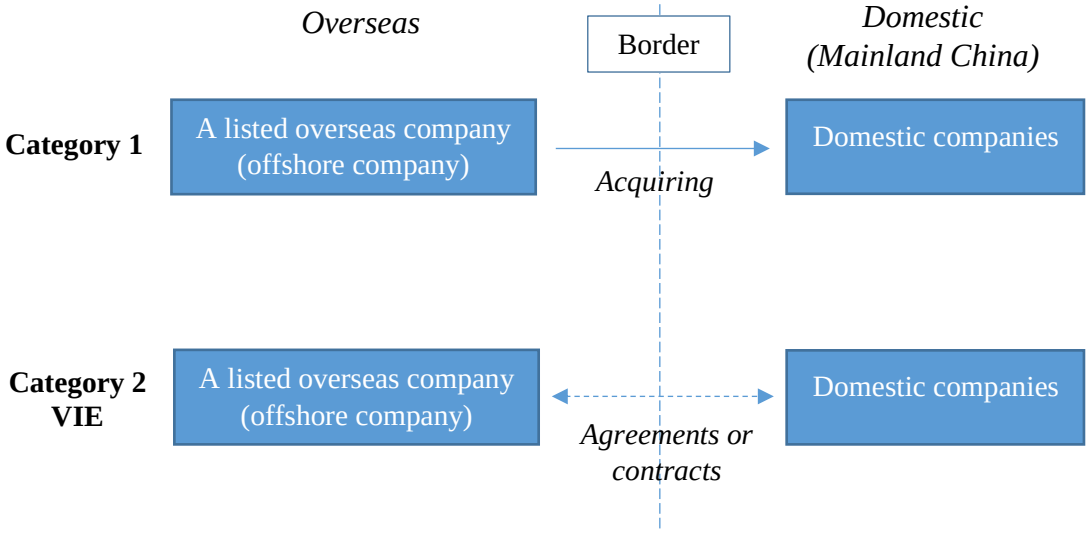
The registration-based IPO system is widely used in many overseas stock markets for a firm to meet the criteria for listing. However, an approval system is still operated by the China Securities Regulatory Commission (CSRC) for those Chinese firms (registered in mainland China) to list domestic or overseas. The approval system causes the listing barrier, for example, a queuing phenomenon in IPO applications in the A-share market.[30] Compared with the serious queuing phenomenon in the A-share market, overseas stock markets' operation is more transparent and efficient, and the general listing period of

[27] China's bond market is also not the main channel for capital allocation in mainland China.
[28] Daniel Ren. (2016) Backlog of Chinese IPO applicants tests regulator's reform resolve. *South China Morning Post*, accessed on 17 Jun, 2016 at: https://www.scmp.com/business/companies/article/1976811/backlog-chinese-ipo-applicants-tests-regulators-reform-resolve
[29] Sun et al. (2013) provide a brief history of China's IPO quota system.
[30] Daniel Ren. (2016) Backlog of Chinese IPO applicants tests regulator's reform resolve. *South China Morning Post*, accessed on 17 Jun, 2016 at: https://www.scmp.com/business/companies/article/1976811/backlog-chinese-ipo-applicants-tests-regulators-reform-resolve

overseas stock markets is about 6-12 months. If a Chinese firm registered in mainland China applies directly to list overseas, it is a challenge to negotiate with different government departments. This is a long cycle of application process along with government inefficiency. To seek a successful listing, Chinese firms need to spend time and energy handling relationships with the government due to the approval system. In mainland China, political forces usually affect the IPO decision (Piotroski and Zhang, 2014), which increases the difficulty for Chinese firms. As for Chinese privately-owned firms, the application process is full of unknowns and challenges compared with their state-owned peers. Therefore, Chinese privately-owned firms usually choose to establish an "offshore company" outside mainland China (e.g., Hong Kong, Bermuda Islands, or the Cayman Islands) to indirectly list in overseas stock markets (see Figure 2.2). This channel can effectively bypass the supervision of the CSRC and speed up the listing process without obtaining approval from the CSRC. Figure 2.2 shows that although the listed company is an offshore company outside mainland China, the listed company can control entity companies in mainland China by acquisition. Another way is that the listed company signs various agreements or contracts with entity companies.[31]

[31] This is called a "Variable Interest Entities (VIE)" structure.

Figure 2.2 Chinese overseas-listed firm's structure (via "offshore company")
A listed overseas company (offshore company) can control domestic companies in mainland China by acquiring or by signing agreements or contracts with entity companies to form what is called a "Variable Interest Entity (VIE) Structure". The VIE structure has been widely used after 2006[32] in some industries as it allows foreign investors to overcome investment restrictions or prohibitions (e.g., technology, media and communications, medical and education-related industries). Source: created by the author.



2.3.2. Chinese firms' overseas listing motivation

The motivation for overseas listing is different for state-owned firms and privately-owned firms in China. The Chinese government has a strategy of reforming and restructuring Chinese state-owned firms by using share issue privatization (SIP) (Sun et al., 2013). Overseas listing is an ideal policy tool to accomplish the goal. If Chinese state-owned firms are listed on foreign stock exchanges with high listing requirements, it will help to modernize the corporate system in China. Also, Chinese state-owned firms have an opportunity to utilize foreign capital to develop their business, to make up for the domestic capital shortage. As China's stock exchanges are young and underdeveloped, Chinese state-owned firms that list on foreign stock exchanges can relieve new IPO pressure on the domestic stock exchanges. The existence of "H-shares" demonstrates that the Chinese government uses foreign stock exchanges as a policy tool (Sun et al., 2013). "Red chip" firms on the Stock Exchange of Hong Kong (SEHK) are another group of

[32] The Chinese government enacts a new law "Interim Provisions on Mergers and Acquisitions of Domestic Enterprises by Foreign Investors" in 2006. Available at: http://english.mofcom.gov.cn/article/policyrelease/Businessregulations/201303/20130300045825.shtml

Chinese state-owned firms after share issue privatization (SIP) but incorporated outside mainland China, and controlled by Chinese government entities. The existing literature shows that Chinese state-owned firms' overseas listing decisions are related to government intervention. Peng and Blevins (2012) argue that Chinese state-owned firms choose to cross-list in the US when planning to implement strategies (e.g., M&A) outside of Asia. Hung et al. (2012) find that managers of Chinese state-owned firms choose to list their stocks on foreign stock exchanges to realize private political benefits, for example, receiving recognition in the political media or as a means of gaining promotion to a senior government position. Pan and Brooker (2014) argue that the geographical distribution of Chinese firms' overseas listings is directly influenced by Chinese government policy.

But why do Chinese privately-owned firms also list overseas? Peng and Blevins (2012) indicate that Chinese privately-owned firms choose to list overseas to achieve a lower cost of capital. The possible reason is that the financial environment in mainland China hinders Chinese privately-owned firms' growth. Due to government intervention, Chinese privately-owned firms find it very difficult to obtain funds from the A-share stock market and the Chinese banking system, compared to their state-owned peers. For example, Chinese privately-owned firms usually encounter discrimination when obtaining loans from the Chinese banking system (Brandt and Li, 2003; Lu et al., 2012). Therefore, Chinese privately-owned firms rely on alternative financing channels to overcome an imperfect financial system in mainland China (Allen et al, 2005). Ayyagari et al. (2010) also find that informal finance is commonly used by Chinese privately-owned firms.

2.3.3. Development of Chinese firms' overseas listings

Chinese firms started to list on overseas stock markets since the late 1980s (Pan and Brooker, 2014). Pan and Brooker (2014) provide information about Chinese firms' listings around the world. Table 2.1 shows that Chinese firms have chosen Hong Kong as the main target stock market to list in. At the end of 2011, there were 549 Chinese firms listed in Hong Kong. The geographical, cultural, and social proximity of Hong Kong to China is the best explanation for Hong Kong being the first-ranked choice for Chinese firms' overseas listings. The second favourite destination is the US: there were 84 Chinese firms listed on the New York Stock Exchange (NYSE) and 179 listed on

NASDAQ at the end of 2011. Singapore also attracted 182 Chinese firms by the end of 2011. In addition, the remaining stock markets shown in Table 2.1 also attract a few Chinese firms.

Table 2.1 Development of Chinese firms listed on major stock exchanges (1991-2011)
This table presents the details of Chinese firms listed on major stock exchanges from 1991 to 2011. The data is from the paper by Pan and Brooker (2014).

Major stock exchanges	1991	1996	2001	2006	2011
Hong Kong Stock Exchange	6	60	153	333	549
NASDAQ	0	0	10	41	179
New York Stock Exchange	0	5	15	23	84
American Stock Exchange	0	0	1	8	43
Singapore Exchange	0	7	21	117	182
London Stock Exchange	0	1	6	7	7
Toronto Stock Exchange	0	3	4	19	47
Australian Securities Exchange	0	0	0	2	13
Frankfurt Stock Exchange	0	0	0	0	39
Tokyo Stock Exchange	0	0	0	1	3
Korea Exchange	0	0	0	0	17

Financial institutions classify different types of shares issued by Chinese firms (see Table 2.2). According to the location of registration, Chinese listed firms can be classified into two groups: direct listings (i.e., A-share, B-share, and H-share) and indirect listings (i.e., Red chip and P chip). For example, an “H-share” firm incorporates in mainland China and applies to list directly in Hong Kong after obtaining the approval of the China Securities Regulatory Commission (CSRC). “A-share” and “B-share” firms are also approved by the CSRC to list in mainland China. These listed firms in Hong Kong are called “Red chip” or “P chip” firms. The Red chip firms are controlled by China state entities and the P chip firms are controlled by individual Chinese entities.

Table 2.2 Share classes in mainland China and Hong Kong
The table displays the different categories of Chinese firms listed in mainland China and Hong Kong.

Share class	Location of registration	Location of Trading	Trading Currency	Listing Type
A-share	Mainland China	Shanghai or Shenzhen	CNY	Direct listing
B-share	Mainland China	Shanghai or Shenzhen	USD or HKD	Direct listing
H-share	Mainland China	Hong Kong	HKD	Direct listing
Red chip	Outside Mainland China	Hong Kong	HKD	Indirect listing
P chip	Outside Mainland China	Hong Kong	HKD	Indirect listing

2.4. The benefits of a Hong Kong listing

2.4.1. Diversified financing methods

Compared with an underdeveloped financial system in mainland China, Hong Kong is an important international financial centre that provides multiple financing channels. Importantly, Hong Kong is an open stock market for global investors. Hong Kong does not have foreign exchange controls[33], and capital outflows are not restricted. However, foreign investors face various investment restrictions in mainland China. For example, foreign investors are restricted or prohibited to invest in technology, media and communications, medical and education-related industries.[34] In mainland China, the "Qualified Foreign Institutional Investor (QFII)" program mainly plays a key role in restricting foreign investors and was cancelled in 2019 by the Chinese government. Before the QFII program, the B-share was the only way that foreign investors could invest in mainland China. If Chinese firms are listed in Hong Kong, in addition to issuing stock, they can also obtain finance through bank commercial lending, private equity investment, venture capital, and bond issuance. Therefore, Chinese firms have an

[33] China has strict foreign exchange management for individuals and firms, but Hong Kong (based on "One country, two systems" principle) does not follow foreign exchange controls.
[34] See "Catalogue of Industries for Guiding Foreign Investment (Revision 2017)" by the Chinese government.

advantage in external financing if they list in Hong Kong. Hong Kong-listed Chinese firms are less likely to be financially constrained (Yang and Lau, 2006). For example, the Chinese government can instruct state-owned firms to list in Hong Kong to tap international capital to develop their business, which is a political strategy tool to relieve the problem of capital shortage in the mainland Chinese market.

2.4.2. High international credibility, prestige and visibility

As the Hong Kong stock market has higher accounting, legal, and governance standards than the mainland Chinese stock market, Chinese firms will improve their credibility and prestige after a Hong Kong listing due to the bonding effect. Hong Kong as a developed stock market has a better information environment than mainland Chinese stock markets. The Hong Kong stock market prompts Chinese listed firms to disclose more information under the strict legal supervision system of Hong Kong. Also, foreign investors in the Hong Kong stock market have a greater ability to use information compared to investors in the mainland Chinese stock market, which induces Hong Kong-listed Chinese firms to disclose more firm-specific information (Li et al., 2015). Furthermore, the "Home Bias Puzzle[35]" has shown that US investment managers have a strong preference for US local firms compared to foreign firms listed on US stock exchanges. Hong Kong has geographical, cultural, and social proximity to mainland China, and so Chinese firms listed in Hong Kong are more easily covered by various media and analysts, which means that home bias is less likely to be an issue for the Hong Kong market. For example, Yang and Lau (2006) provide an empirical finding that Chinese firms listed in Hong Kong have a better information environment compared with those Chinese firms only listed in the US; that is, Chinese firms listed in Hong Kong enjoy high analyst coverage. The ability of the Chinese government to instruct state-owned firms to list in Hong Kong can improve their credibility and prestige, which can be used to realize future international acquisition strategies.

2.4.3. A bridge with global financial networks

Hong Kong is an internationally recognized financial centre and links with global capital markets. If Chinese firms have listed in Hong Kong, it is convenient for a secondary

[35] Coval and Moskowitz (1999) document more about the "Home Bias" that US investment managers have for domestic stocks.

listing in other stock markets across the world (e.g., US, UK, Singapore).[36] The main reason for this is that the Hong Kong stock market has higher accounting, governance, and legal standards than mainland Chinese stock markets, which makes Chinese firms recognized and accepted by other stock markets. Therefore, a Hong Kong listing improves Chinese firms' international credibility and prestige. Hong Kong as a developed stock market with geographical, cultural, and social proximity to mainland China, is a good choice for Chinese firms' global listing strategy. For example, Chinese state-owned firms usually firstly choose to list on a stock exchange in mainland China, and then cross-list in Hong Kong as an "H-share", and then cross-list in the US as an "ADR" (Peng and Blevins, 2012). Chinese privately-owned firms have more difficulty in following the "H-share" route to realizing the dream of listing in the US. They usually firstly choose to list in Hong Kong as a "P chip" and then subsequently cross-list in the US as an "ADR". Therefore, Chinese firms can use a "Hong Kong listing" to realize the strategy of listing across the world. For example, if Chinese state-owned firms are planning to implement their strategies outside of Asia, they will typically first choose to list in Hong Kong from mainland China, and then they can successfully cross-list in the US (Peng and Blevins, 2012).

2.5. Methodology of firm sample selection

2.5.1. Foreign listed sample of previous studies

Foreign listing is a strategic choice for a firm to list in a new overseas stock market. Karolyi (2012) argues that cross-listing is often related to different transparency, disclosure, and governance requirements. Prior literature pays more attention to cross-listings on US exchanges during the past two decades (see Karolyi, 2012). Karolyi (2012) notes that the new trend in cross-listing study is the debate on the "bonding hypothesis". Table 2.3 presents the sample selection methods of cross-listing studies among the top three finance journals recently (i.e., Journal of Finance, Review of Financial Studies, Journal of Financial Economics). All of these studies focus on the US stock market, and they all choose foreign firms listed on US stock exchanges (i.e., NYSE, NASDAQ, OTC or 144a). There are only two studies that include Chinese firms in Table 2.3. China as the largest emerging country in the world experiences rapid development of the economy.

[36] Peng and Blevins (2012) show a path that Chinese firms use to cross-list in the US when they have been listed in Hong Kong.

Meanwhile, it is a great tendency that Chinese firms pursue to list on overseas stock exchanges in recent decades (Pan and Brooker, 2014). But there are scarce studies to address Chinese foreign listed firms. Importantly, Karolyi (2012) surveys cross-listing studies and suggests that new research about cross-listing should focus on stock markets across the world (not only the US), and he also notes that Hong Kong has been a leading stock market in recent years. Combining the above factors, this thesis chooses to examine Chinese listed firms on the Stock Exchange of Hong Kong (SEHK).

Table 2.3 Sample selection of previous foreign listing studies

This table shows the sample selection methods of foreign listing studies among the top three finance journals (i.e., *Journal of Finance*, *Review of Financial Studies*, *Journal of Financial Economics*) from 2002 to 2012.

Author(s)	Sample	Chinese firm
Reese and Weisbach (2002)	Cross-listing: 2,038 foreign firms listed in the US Domestic firms: 17,380 firms	No
Doidge (2004)	Dual-class cross-listed: 137 dual-class foreign firms listed in the US Dual-class firms: 745 dual-class firms	No
Doidge et al. (2004)	Cross-listed: 712 foreign firms listed in the US Not Cross-listed: 4,078 domestic firms	No
Doidge et al. (2009)	Cross-listed: 348 foreign firms listed in the US Not Cross-listed: 3,932 purely domestic firms	No
Hail and Leuz (2009)	ADR firms: 1,694 foreign firms listed in the US Non-ADR firms: 9,493 firms listed in the US	Yes (73 Chinese ADR firms)
King and Segal (2009)	XLIST sample: 287 dual-class Canadian firms listed in the US Non-XLIST sample: 1,890 One-share-one-vote Canadian firms	No
Foucault and Frésard (2012)	Cross-listed firms: 1,468 foreign firms listed in the US Control sample: 20,027 purely domestic firms	Yes (Cross-listed firms: 36, Control sample: 1,510)

There are only a few studies that address Chinese foreign listed firms that as the sample in previous studies, for example, Yang and Lau (2006), Hung et al. (2012), Ke et al. (2012), Sun et al. (2013), Pan and Brooker (2014), Li et al. (2015), and Filip et al. (2020).

Table 2.4 reports the sample selection methods of these studies. Several studies consider Hong Kong listing as a foreign listing (e.g., Yang and Lau, 2006; Hung et al., 2012; Sun et al., 2013; Pan and Brooker, 2014). Sun et al., (2013) choose H-share firms as an overseas listed sample and Li et al. (2015) choose AH-share firms[37] as a cross-listed sample. Filip et al. (2020) argue that Chinese firms listed in Hong Kong are cross-listed and choose P-chip firms as the cross-listed sample.

Table 2.4 Sample selection of foreign listing studies focused on China
This table presents the sample selection methods of studies of foreign listings that only examine Chinese firms from 2006-2020.

Author(s)	Sample
Yang and Lau (2006)	Foreign total: 237 Chinese firms listed in Hong Kong, the United States, Singapore, and London Domestic total: 1,278 Chinese firms listed in Shanghai and Shenzhen
Hung et al. (2012)	Overseas listed firms: 79 Chinese firms listed in Hong Kong, London, and U.S. NYSE Domestically listed firms: 939 Chinese firms listed in Shanghai and Shenzhen
Ke et al. (2012)	State-controlled Chinese firms listed in Hong Kong: 124 H-shares, 71 Red chip shares State-controlled Chinese firms listed in mainland China: 266 A-shares
Sun et al. (2013)	Overseas listing: 54 Pure H-share firms and 51 AH-share firms Domestic listing: 1,390 Pure A-share firms and 23 Pure B-share firms
Pan and Brooker (2014)	Nearly 1,300 Chinese firms listed on various stock exchanges in the world
Li et al. (2015)	Cross-listed firms: 60 AH-share firms Control sample: A-share firms
Filip et al. (2020)	P-chip firms: Chinese firms listed on the main board of the HKSE Non-P-chip firms: local Hong Kong firms on the main board of the HKSE

[37] Chinese firms are both traded as "A-share" on the Shanghai Stock Exchange (or the Shenzhen Stock Exchange) and "H-share" on the Stock Exchange of Hong Kong, which is called "AH-share".

2.5.2. Definition of foreign listed firms in the thesis

Hong Kong listing is still officially considered as a foreign listing by the China Securities Regulatory Commission (CSRC) even after 1997. Hong Kong is a special administrative region and keeps the common law legal tradition according to the "one country, two systems" principle based on the "Sino-British Joint Declaration[38]". Accordingly, Hong Kong's economic and financial system is different from mainland China. For example, the "United States-Hong Kong Policy Act[39]" clearly confirms that Hong Kong is different from mainland China after 1997. According to "WJP Rule of Law Index 2015[40]", the index of Hong Kong is 0.76 (rank 17 in the world) similar to the UK (0.78) while mainland China is only 0.48 (rank 71 in the world). La Porta et al. (1998) and Allen et al. (2005) both report significant differences in the rule of law between Hong Kong and mainland China. In addition, several studies consider a Hong Kong listing is an overseas listing (Yang and Lau, 2006; Hung et al., 2012; Pan and Brooker, 2014). Filip et al. (2020) argue that a mainland Chinese firm listing in Hong Kong is a cross-listing. However, Sarkissian and Schill (2016) argue that "foreign listing, overseas listing, or cross-listing" can be used interchangeably in academic research. In this thesis, a Hong Kong listing is classified as a foreign listing.

This thesis chooses Chinese firms listed in Hong Kong as its foreign listed sample. The reason for only choosing Hong Kong as the target listing market is as follows: First, Chinese firms can directly list on the Stock Exchange of Hong Kong (SEHK) rather than using a depositary receipt programme. It is evident from Table 2.1 that most Chinese firms that list abroad choose to have their first listing as well as their main listing in Hong Kong. However, if Chinese firms are planning to list on US stock exchanges, the American depositary receipt (ADR) programme is the only channel available for them, based on US laws and regulations. A similar depositary receipt (DR) programme is also

[38] The Sino-British Joint Declaration is a treaty signed between the United Kingdom and China on Hong Kong under Chinese sovereignty, which stipulates the sovereign and administrative arrangement of Hong Kong after 1 July, 1997.

[39] The United States-Hong Kong Policy Act, more commonly known as the Hong Kong Relations Act is a 1992 act enacted by the United States Congress. It allows the United States to continue to treat Hong Kong separately from mainland China for matters concerning trade export and economic control after the 1997 Hong Kong handover.

[40] The World Justice Project Rule of Law Index is the world's leading source for original, independent data on the rule of law. Covering 128 countries and jurisdictions, the Index relies on more than 130,000 household surveys and 4,000 legal practitioner and expert surveys to measure how the rule of law is experienced and perceived worldwide.

required for Chinese firms that choose to list on the London Stock Exchange (LSE). In practice, most Chinese firms traded as American depositary receipts (ADRs) on US stock exchanges are secondary listings, and their first listings are usually on the Stock Exchange of Hong Kong (SEHK). Similarly, a limited number of Chinese firms traded on the London Stock Exchange (LSE) are also traded as a secondary listing. Although the US is the second target stock market for Chinese firms, most Chinese firms listed in the US are usually high growth firms in the information technology and internet industry and are mainly concentrated on NASDAQ. Hong Kong is the stock market that has attracted the largest number of Chinese firms to list there, compared to other mature stock markets across the world (see Pan and Brooker, 2014). Therefore, Chinese firms that are listed on the Stock Exchange of Hong Kong (SEHK) provide an ideal sample for investigation.

Second, the previous literature on foreign listings by Chinese firms almost exclusively focuses on "H-shares", with "Red chips" and "P chips" usually neglected. The importance of P chips on the Stock Exchange of Hong Kong (SEHK) as a large category of Chinese firms is first addressed by Filip et al. (2020). If "Red chips" or "P chips" are not included in the sample of firms investigated, this may lead to sample selection bias as the sample would not be representative of Chinese firms' foreign listing. Therefore, this thesis collects a unique sample that includes all three categories of Chinese firms (i.e., H-share, Red chip, and P chip) that are listed on the Stock Exchange of Hong Kong (SEHK) to provide the basis for a comprehensive investigation.

Third, the literature that addresses Hong Kong listings covers a number of different topics. For example, previous literature shows mixed findings regarding the bonding theory (e.g., Huang et al., 2016; Filip et al., 2020). Sun et al. (2013) employ a "market order" hypothesis and a governance hypothesis to explain the phenomenon of Chinese state-owned firms listing in Hong Kong. Busaba et al. (2015) propose a new theory called the "dressing-up-for-premium" theory to explain the phenomenon of Chinese firms listing firstly in Hong Kong and then returning to the list in their domestic stock markets. Li et al. (2015) find that foreign investors' ability to discover and process firm-specific information induces Chinese cross-listed firms in Hong Kong to disclose more firm-specific information. There is no study that examines the effect of a Hong Kong listing

by Chinese firms on their corporate investments and M&A activities. This knowledge gap is filled by the thesis.

2.5.3. Foreign listed firms in the thesis

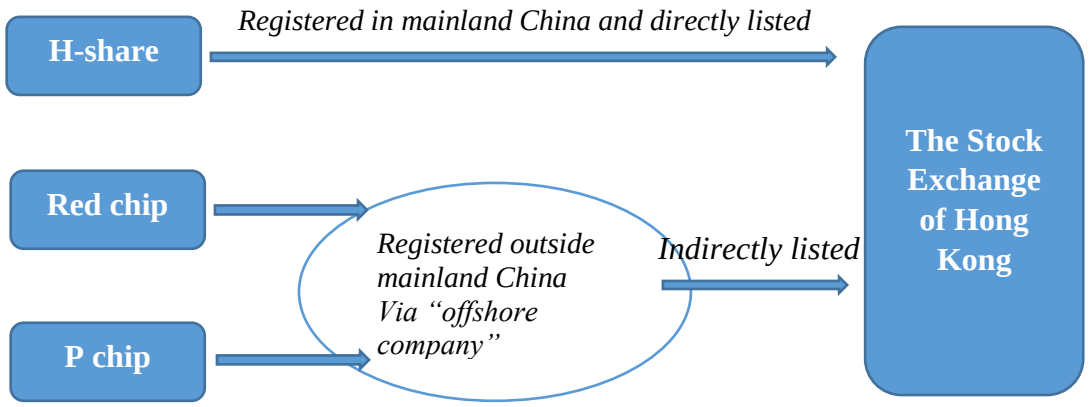
The foreign listed sample[41] for this thesis is selected from Chinese firms which are traded on the Stock Exchange of Hong Kong (SEHK). This thesis only investigates Chinese firms traded on the Main Board of the SEHK. Chinese firms traded on the Growth Enterprise Market (SEHK stock code: 08000-08999) are excluded from the foreign listed sample. The Main Board of SEHK is chosen because it is the main market of SEHK. Also, the firms traded on the Main Board of the SEHK need to meet higher listing standards than those on the Growth Enterprise Market. The Growth Enterprise Market of the SEHK is designed for those firms which do not meet the criteria for listing on the Main Board of the SEHK. Similarly, the EME board and the ChiNext board are two stock markets for growth firms listed in mainland China. The thesis examines Chinese firms on the Main Board of the SEHK, while Chinese firms in the A-share market (the main board in mainland China) are chosen as the control sample. The foreign listed sample includes Chinese firms on the Main Board of the SEHK from 01.2001 to 12.2015 that are covered by DataStream.

There are three categories of Chinese firms on the Main Board of the SEHK (i.e., H-share, Red chip, and P chip). These three categories of Chinese firms use different channels to list in Hong Kong (see Figure 2.3). An "H-share" firm registered in mainland China can apply to list directly in Hong Kong after obtaining approval from the China Securities Regulatory Commission (CSRC). Alternatively, a firm may choose to establish an "offshore company" outside mainland China (e.g., in Hong Kong, the Bermuda Islands or the Cayman Islands) to indirectly list in Hong Kong without obtaining approval from the CSRC. These Chinese listed firms in Hong Kong are called "Red chip" or "P chip" firms. The difference between them is that Red chip firms are controlled by China state entities and P chip Firms are controlled by individual Chinese entities. In addition, some H-share firms are also traded as an "A-share" in mainland

[41] In the foreign listed sample used in the thesis, one group of Chinese firms purely list on the Stock Exchange of Hong Kong, while the other Chinese firms cross-list in several stock exchanges (including Hong Kong) across the world. The common characteristic is that these Chinese firms all list in Hong Kong.

China, approved by the CSRC. These Chinese firms are traded as both "A-shares" and "H-shares" and are called "AH-shares".[42]

Figure 2.3 Three categories of Chinese listed firms in Hong Kong
These three categories of Chinese firms use different channels to list in Hong Kong. The "H share" firm is registered in mainland China and applies to list directly in Hong Kong after obtaining the China Securities Regulatory Commission (CSRC)'s approval. Alternatively, the Red chip and P chip choose to establish an "offshore company" outside mainland China (e.g., Hong Kong, Bermuda Islands, or the Cayman Islands) to indirectly list in Hong Kong without obtaining approval from the CSRC. Source: created by the author.



The list of Chinese firms (H-share[43] and Red chip[44]) is provided by the official website of the SEHK. Delisted Chinese firms (H-share and Red chip) for this thesis were obtained from annual SEHK Fact Books.[45] The P chip firms are selected from those firms listed on the Stock Exchange of Hong Kong (SEHK) that are not classified as H-shares or Red chips. To identify P chip firms traded on the Main Board of SEHK, this thesis employs two key criteria: first, the geographical location of corporate headquarters ─ if a firm is headquartered in mainland China, it is classified as a P chip; second, the geographic segments of a firm's assets and revenues ─ if a firm's revenue (100%) is derived from

[42] For example, Shanghai Stock Exchange provides the AH-share list, available at: http://www.sse.com.cn/assortment/stock/areatrade/ahassortment/
[43] List of H-share companies, available at: https://www.hkex.com.hk/market-data/statistics/consolidated-reports/china-dimension?sc_lang=en#select1=0&select2=0
[44] List of Red chip companies, available at: https://www.hkex.com.hk/Market-Data/Statistics/Consolidated-Reports/China-Dimension?sc_lang=en&select={55AE8A39-A5A2-4489-95E1-21E30BDEAFD7}#select1=0&select2=1
[45] Available at: https://www.hkex.com.hk/Market-Data/Statistics/Consolidated-Reports/HKEX-Fact-Book?sc_lang=en

mainland China or a firm's assets (100%) are located in mainland China, it is classified as a P chip. The data about corporate headquarters and geographic segments are collected from S&P Capital IQ. In addition, this thesis also obtained P chip information from the "Russell Global Index membership list[46]". Figure 2.4 shows how to select P chips from firms on the Main Board of SEHK. Also, the thesis employs three examples to illustrate how these criteria were used to confirm a firm as a P chip, or otherwise (see Appendix 1). Similarly, data for delisted Chinese firms (P chips) are collected from annual SEHK Fact Books.

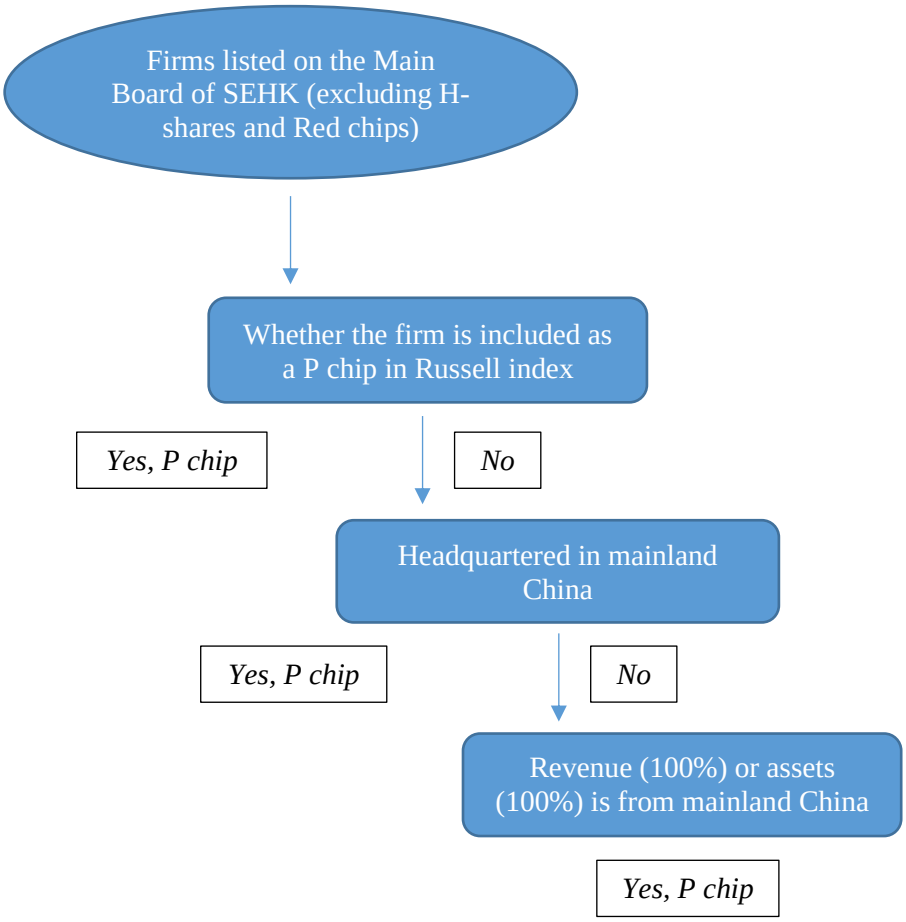
The foreign listed sample includes Chinese firms on the Main Board of the SEHK from 01.2001 to 12.2015 covered by DataStream. The thesis starts in 2001 because the first P chip listing on the Stock Exchange of Hong Kong (SEHK) occurred in 2000.[47] The initial sample of the Stock Exchange of Hong Kong (SEHK) covered by DataStream is 2,536 firms. Firstly, 383 firms traded on the Growth Enterprise Market (SEHK stock code: 08000-08999) are excluded from the initial sample. Therefore, the 2,153 firms that remain are traded on the Main Board of the SEHK. The thesis needs to discover the number of Chinese firms that are included in the 2,153 firms traded on the Main Board of the SEHK (i.e., that exist as a Chinese foreign listed sample). For Chinese firms traded as "H-shares" on the Main Board of the SEHK, the sample selection is based on the list of Chinese H-share firms provided by the official website of the SEHK. There are 167 Chinese firms (excluding financial service firms[48] or firms without data from 01.2001 to 12.2015) that are confirmed as "H-shares" from the 2,153 firms on the Main Board of the SEHK. As for Chinese firms in the category of "Red chips" on the Main Board of the SEHK, the selection principle is also based on the information provided by the official website of the SEHK. There are 160 Chinese firms (Red chips) found among the 2,153 firms on the Main Board of the SEHK. After excluding financial service firms or firms without data from 01.2001 to 12.2015, there are 142 Chinese firms in the category of Red chips in the foreign listed sample.

[46] This index list only provides some P chip firms on the Stock Exchange of Hong Kong.
[47] China through the mosaic of its share classes. 2016. FTSE Russell Research available at: https://www.ftserussell.com/files/research/china-through-mosaic-its-share-classes
[48] Real estate firms are not excluded as the China Securities Regulatory Commission (CSRC) notes that the real estate is an independent sector and does not belong to the financial sector.

The most important part of the sample selection is to confirm those Chinese firms that fall under the category of P chips from among 2,153 firms on the Main Board of the SEHK. The identification of P chips is based on the standards and guidelines for selecting "P chip firms" shown in Figure 2.4. Finally, 289 Chinese firms (P chips) are confirmed based on the criterion that their headquarters are located in mainland China. Also, 93 Chinese firms (P chips) are confirmed based on the criterion that their assets or revenue are 100% based in or derived from mainland China. In addition, 58 Chinese P chip firms are confirmed according to the information provided by the compilers of the Russell index. In total, there are 460 Chinese firms that fall under the category of P chips among the foreign listed sample. Overall, there are 167 H-shares, 142 Red chips, and 460 P chips in the foreign listed sample of the thesis.

Figure 2.4 The process for selecting P chip firms

The flow chart presents the process used to select P chip firms from the listed firms on the Stock exchange of Hong Kong (SEHK). First, H-shares and Red chips are excluded as these two categories of Chinese firms are labelled by the SEHK. Then, P chip firms in the Russell index are identified (only some Chinese firms). Finally, other P chips firms are identified by the location of their headquarters, or by the source of their revenues or assets.



2.5.4. Domestically listed sample in this thesis

The domestic listed sample is selected from Chinese firms traded on the Shanghai stock exchange (SSE) or the Shenzhen stock exchange (SZSE) as A-shares from 01.2001 to 12.2015 that are covered by DataStream. Chinese firms called "AH-share" firms are listed both in mainland China and Hong Kong, and are excluded from the domestically listed sample and included in the foreign listed sample. The data for delisted Chinese firms (A-share) were checked and collected from the official website of the Shanghai Stock Exchange (SSE)[49] and the Shenzhen Stock Exchange (SZSE).[50]

[49] Available at: http://www.sse.com.cn/assortment/stock/list/delisting/
[50] Available at: http://www.szse.cn/market/companys/suspend/index.html

Table 2.5 Foreign (Hong Kong) listed firms and domestically listed firms
This table reports all Chinese listed firms in the sample from 2001 to 2015. The allocation of firms to the different firm types is done by the author.

Foreign (Hong Kong) listed firms	Number	Domestically listed firms	Number
H-share	167	*Shanghai (A-share)*	1,046
Red chip	142	*Shenzhen (A-share)*	466
P chip	460		
Total	769		1,512

After excluding financial service firms or firms without data from 01.2001 to 12.2015, the domestic listed sample includes 1,512 Chinese firms (A-share). The domestic listed Chinese firms are employed as a control sample in this thesis. Their accounting data and stock market data are based on data from the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE). To sum up, there are 769 Hong Kong-listed firms and 1,512 domestically listed firms in the sample. Table 2.5 provides more detail about the different categories of firms. Appendix 2 shows the distribution of the firm sample in different sectors.

Chapter 3 Hong Kong Listing and Investment Efficiency

3.1. Introduction

Investment efficiency is a fundamental question in corporate finance. Previous studies suggest that information asymmetry and agency problems are two frictions that affect the efficiency of capital allocation (Stein, 2003). However, there are fewer studies about the real consequences for corporate investment as a result of the foreign listing. A foreign listing may improve a firm's information environment (e.g., Lang et al., 2003; Bailey et al., 2006), which could contribute to the efficiency of capital allocation. On the other hand, a foreign listing may improve corporate governance for firms from developing countries, in line with the bonding hypothesis (Coffee, 1999 and Stulz, 1999). This study focuses on Hong Kong as it is a region with a common law system as well as a transparent stock market. Hong Kong is also the first choice for Chinese firms listing on overseas stock exchanges (Pan and Brooker, 2014). This raises a question: does a Hong Kong listing improve the ability of Chinese firms to make efficient corporate investments?

There are only a few studies that address the relation between cross-listing and investment efficiency. Foucault and Gehrig (2008) develop a theoretical model that shows that cross-listing improves managers' ability to obtain precise information from stock prices, which contributes to value-enhancing investments. Their model implies that cross-listed firms should have a higher investment-to-price sensitivity than non-cross-listed firms. Accordingly, Foucault and Frésard (2012) empirically support the theory and find that cross-listed firms do have a higher investment-to-price sensitivity in comparison to non-cross-listed firms, using a large sample of foreign firms listed in the US stock market from 1989 to 2006. They employ the "managerial learning hypothesis" to explain how cross-listing improves managers' ability to obtain precise information from stock prices to improve the efficiency of their investments. The managerial learning hypothesis is based on the information asymmetry between managers and investors. Investors have information that managers do not have, and this information is incorporated in stock prices. Managers can extract some information from stock prices to help their decisions. The level of investor protection is also associated with investment efficiency. McLean et al. (2012) argue that good investor protection improves firms' investment efficiency (i.e., it results in a high investment-to-price sensitivity). Ghosh and

He (2015) find that improved investor protection due to cross-listing has a positive impact on investment decisions and investment efficiency. They argue that investment efficiency is improved as a result of better cash utilization by cross-listed firms.

The objective of this study is to investigate whether a Hong Kong listing improves Chinese firms' investment efficiency. Firstly, the study examines whether Hong Kong-listed Chinese firms have a higher sensitivity of investment to investment opportunities (Tobin's Q) compared with their domestically listed peers. Secondly, the study examines whether Hong Kong-listed Chinese firms are associated with underinvestment or overinvestment compared with their domestically listed peers. Using a large sample of Chinese listed firms from 2001 to 2015, the study finds that Hong Kong-listed Chinese firms have a higher investment-to-Q sensitivity than their domestically listed peers. Also, Hong Kong-listed Chinese firms are not associated with underinvestment. Overall, the findings suggest that a Hong Kong listing improves Chinese firms' investment efficiency.

This study makes important contributions to the literature in two ways. First, the study provides a comprehensive investigation of Chinese firms listed on the Stock Exchange of Hong Kong (SEHK) by including all three categories of Chinese firms (i.e., H-share, Red chip, and P chip). The study finds that only one category of Chinese firms, privately-owned P chip firms, increases investment efficiency after a Hong Kong listing. Therefore, the different categories of Chinese firms perform differently after a Hong Kong listing. That is, the effect of a Hong Kong listing should consider the listing category on the SEHK (i.e., whether firms are H-share, Red chip, or P chip). Second, the study adds to the literature about Chinese firms' investment efficiency (e.g., Chen et al, 2011; Chen et al, 2018; Wang et al, 2020). These studies focus on different factors that may influence Chinese firms' investment efficiency, for example, government intervention (Chen et al., 2011), corporate philanthropy (Chen et al., 2018) and bank ownership (Wang et al, 2020). The present study extends this strand of research to examine the effect of a Hong Kong listing (a foreign listing) on Chinese firms' investment efficiency and finds that a Hong Kong listing improves Chinese firms' investment efficiency using a unique sample of Chinese firms listed on the SEHK.

The remainder of this chapter is structured as follows. Section 3.2 reviews the related literature and develops hypotheses. Section 3.3 presents the research methodology. Section 3.4 reports the empirical results. Section 3.5 provides the robustness test. Section 3.6 presents the conclusions.

3.2. Related literature and hypotheses development

3.2.1. Investment efficiency and Tobin's Q

In a perfect capital market as defined by Modigliani and Miller (1958), firm-level investment is only determined by investment opportunities (measured as Tobin's Q). However, the perfect capital market without any friction is only a theoretical assumption. The extant theoretical and empirical studies have noted that information asymmetry and agency problems are two main frictions that affect firm-level investment efficiency (Stein, 2003).

One branch of the literature shows the connection between stock price informativeness (the informational content of prices) and investment efficiency. Durnev et al. (2004) find that more efficient corporate investment is associated with more informative stock prices. Bond et al. (2012) review the literature about the real effects of financial markets. They argue that prices reflect information that is helpful for efficient decision making. The informational feedback of market prices plays an important role in financial markets. A growing number of studies provide empirical evidence to support the managerial learning hypothesis, that is, the view that stock price informativeness improves investment efficiency.

The managerial learning channel can reduce information asymmetry between managers and outside investors. Thereby, it enhances information exchange between the stock market and the firm. Chen et al. (2007) find that the amount of private information has a significant positive impact on the sensitivity of investment to stock prices, using US stock market data. Namely, there is a stronger investment sensitivity to stock price (Tobin's Q) when firms' stock prices are more informative. The results suggest that managers obtain private information from stock prices and use this information to make effective investment decisions. Bakke and Whited (2010) investigate whether managers make investment decisions by following the informational feedback of stock prices, using a

large sample of firms from 1991 to 2004. They find weak evidence that stock market mispricing can affect investment decisions. Therefore, they confirm that managers extract private information from stock prices to make investment decisions. Foucault and Frésard (2014) study whether peers' market valuation (stock prices) matters for firms' investment. They use a large sample of US public firms from 1996 to 2008 that are industry-matched (i.e., that sell similar products). Their findings indicate that managers do significantly learn from their peers' stock prices to make investments.

The cross-listing decision may also affect investment efficiency (i.e., the sensitivity of investment to Tobin's Q). Foucault and Gehrig (2008) develop a theory that shows that cross-listing improves managers' ability to obtain accurate information conveyed in their firms' stock prices (e.g., growth opportunities) and this learning channel can help them to make better investment decisions. Subsequently, Foucault and Frésard (2012) examine the theory using a large sample of firms that were cross-listed on US exchanges from 1989 to 2006 and find that cross-listed firms have a higher investment-to-price sensitivity compared with non-cross-listed firms. They argue that this higher investment-to-price sensitivity is mainly driven by the informativeness of stock prices. Their findings support Foucault and Gehrig's (2008) theory.

The agency problem (as reflected in ownership structure) has an impact on investment efficiency (i.e., the sensitivity of investment to Tobin's Q). Jiang et al. (2011) investigate whether the control-ownership wedge has an impact on investment sensitivity to stock price (Tobin's Q). The control-ownership wedge is measured as the divergence between voting rights (control) and cash flow rights (ownership). Jiang et al. (2011) find that there is a strong negative relation between the control-ownership wedge and investment sensitivity to stock price, based on an examination of a large sample of East Asia firms and Western European firms from 22 countries. Furthermore, they also find that sub-optimal investment is the main factor that negatively affects investment sensitivity to stock price. Their results suggest that the agency problem plays an important role in the process that enables a firm's managers to learn from stock prices. Chen et al. (2017) investigate the effect of state ownership and foreign institutional ownership on investment efficiency (measured as the sensitivity of investment to Tobin's Q). They examine a large sample of privatized firms from 64 countries from 1981 to 2008 and report that state ownership has a significantly negative impact on investment efficiency

while foreign institutional ownership has a significantly positive impact on investment efficiency. Also, they find that the relationship between foreign institutional ownership and investment efficiency becomes stronger in countries with weaker governance institutions. Overall, they state that investment behaviour and investment efficiency are associated with ownership type.

The government intervention also affects investment efficiency in China. Chen et al. (2011) examine the relation between government intervention and investment efficiency in China. They use two different measures of government intervention. The first is ownership structure, i.e., whether a firm is state-owned or not; the second is political connections, i.e., whether the top executives have a government background. They examine a sample of Chinese domestic listed firms (A-share) from 2001 to 2006 and find that government intervention has a negative impact on investment efficiency for state-owned firms. In general, they argue that government intervention distorts the investment behaviour of state-owned firms and leads to inefficient investment.

Information asymmetry and agency problems are two main frictions that affect firm-level investment efficiency (Stein, 2003). If a Hong Kong listing can overcome the two main frictions, Chinese firms can make better investment decisions. First, the Hong Kong stock market is mature and standardized due to stringent legal supervision. Also, the Hong Kong stock market requests listed firms to disclose more information for investors compared to mainland Chinese stock markets. Therefore, the Hong Kong stock market has a better information environment compared to mainland Chinese stock markets. Information asymmetry between managers and investors could therefore be mitigated by a Hong Kong listing. Second, the Hong Kong stock market has higher accounting, legal, and governance standards than mainland Chinese stock markets. If Chinese firms successfully bond themselves to Hong Kong's legal system, their corporate governance will be improved after a Hong Kong listing. Agency problems could therefore be mitigated by a Hong Kong listing, based on the bonding theory. Overall, the first hypothesis is developed as follows:

Hypothesis 1: *A Hong Kong listing improves Chinese firms' investment efficiency. That is, Hong Kong-listed Chinese firms have a higher sensitivity of investment to investment opportunities (Tobin's Q) compared with their domestically listed peers.*

3.2.2. Underinvestment or Overinvestment

Previous literature suggests that information asymmetry and agency costs are two frictions that affect the efficiency of capital allocation (Stein, 2003). On the one hand, information asymmetry models suggest that underinvestment is caused by information asymmetry between managers and investors (Myers and Majluf, 1984). Managers are motivated to issue new stock to raise cash for a valuable investment opportunity. Managers have more information about the firm's value than potential investors. However, rational investors interpret managers' behaviour and discount the value of new stock issues. Therefore, managers will be reluctant to issue the new stock for a valuable investment opportunity, leading to underinvestment. The Hong Kong stock market is under a higher standard of legal supervision compared to mainland Chinese stock markets. Also, the higher listing requirements of the Hong Kong stock market prompt Chinese firms to disclose enough information for investors. Therefore, the Hong Kong stock market has better market transparency. Information asymmetry between managers and investors could therefore be mitigated by a Hong Kong listing. The second hypothesis is developed as follows:

Hypothesis 2: *Hong Kong-listed Chinese firms are negatively associated with underinvestment compared with their domestically listed peers.*

On the other hand, the theory of agency costs shows that managers may make investment decisions that are not in the best interests of shareholders (Jensen and Meckling, 1976). The agency costs could lead to overinvestment, which depends upon the availability of resources in each firm. For example, managers of cash-rich firms may use the cash reserve to make overinvestment decisions (Jensen, 1986). Harford (1999) reports consistent empirical evidence to support the free cash flow hypothesis by examining the relation between cash reserves and acquisitions. The findings indicate that cash-rich firms are more likely to make diversified acquisitions even though these acquisitions are value-declining. Richardson (2006) also provides consistent empirical evidence that overinvestment is associated with those firms that have higher levels of free cash flow. He finds that corporate governance could reduce overinvestment to some extent. Harford et al. (2008) find that US firms with weaker corporate governance are more likely to spend their cash reserve on acquisitions or capital expenditures. But these investments create lower profitability and valuations.

Corporate governance or investor protection plays an important role in improving investment efficiency. Masulis et al. (2007) argue that corporate governance has an impact on efficient investments (acquisitions). Efficient investments (acquisitions) are associated with acquirers that have an effective board (e.g., separating the role of CEO and chairman). Their findings imply that managers tend to develop and implement worse acquisition decisions if they have poorer corporate governance. The cross-listing studies point out that good investor protection improves investment efficiency. McLean et al. (2012) find that investor protection plays an important role in improving firm-level investment efficiency (investment sensitivity to Tobin's Q) using a large sample of firms during the period 1990 - 2007. Ghosh and He (2015) investigate the relation between cross-listing and investment decisions using a large sample of foreign firms on US stock exchanges across 42 countries from 1996 to 2011. They report that cross-listed firms increase capital expenditures, M&A activities and R&D investments and cross-listed firms are associated with higher profitability compared to non-cross-listed firms. Moreover, their findings suggest that cross-listed firms have better cash utilization and make effective investments, particularly those firms from countries with weak investor protection. Overall, they argue that cross-listing has a positive impact on investment efficiency.

In the case of China, state-owned firms usually face fewer financial constraints compared with privately-owned firms.[51] Therefore, state-owned firms have the possibility of overinvesting due to weak corporate governance in mainland China. Firth et al. (2012) investigate the relation between internal cash flow and corporate investment using a panel of Chinese firms during the period between 1999 and 2008. They find that government-controlled firms have a greater investment-cash flow sensitivity than privately controlled firms. They argue that government-controlled firms are more likely to make overinvestments even if internal funds are abundant or investment opportunities (Tobin's Q) are poor. Bo et al. (2014) also provide a finding that Chinese state-controlled firms are associated with fewer financial constraints, even during the financial crisis. They investigate whether the 2008 financial crisis had an impact on corporate investment in

[51] Firth et al. (2008) argue that Chinese firms with greater state ownership obtain external funding support from Chinese state-owned banks more easily, which leads to an overinvestment bias. Lin and Bo (2012) find evidence that state-owned firms are also faced with financial constraints and that state-ownership does not reduce a firm's financial constraints. They argue that the corporatization and privatization of former state-owned firms has been effective in China.

China. They find that state ownership and foreign ownership play an important role in corporate investment. Namely, state-controlled firms are less affected by the financial crisis compared with non-state-controlled firms. Also, Chinese firms with foreign ownership are less affected by the financial crisis compared to domestic firms.

The bonding hypothesis (Coffee, 1999 and Stulz, 1999) argues that firms list on a new stock market to bond themselves to better legal, regulatory, and capital market institutions. The Hong Kong stock market has higher accounting, legal, and governance standards than the mainland Chinese stock market. If the bonding hypothesis is applicable to Chinese firms listed in Hong Kong, therefore, these firms will be associated with better corporate governance compared with their domestically listed peers. Better corporate governance enables Chinese firms to make more efficient investment decisions, and to prevent overinvestment. Accordingly, the potential agency costs are reduced by a Hong Kong listing. The third hypothesis is developed as follows:

Hypothesis 3: *Hong Kong-listed Chinese firms are negatively associated with overinvestment compared with their domestically listed peers.*

3.2.3. Cross-listing and corporate investment

The effect of foreign listings on corporate investment has received much less attention than other aspects of cross-listings (Foucault and Frésard, 2012; Abdallah and Abdallah, 2017). Abdallah and Abdallah (2017) argue that cross-listing influences corporate investment through two channels: the information environment and the corporate governance mechanism. The authors draw upon two branches of literature. The first argues that cross-listing improves the information environment (e.g., Lang et al., 2003; Bailey et al., 2006). The second argues that cross-listing improves corporate governance through a bonding mechanism (e.g., Stulz, 1999; Coffee, 1999; Reese and Weisbach, 2002; Doidge et al., 2004).

Turning first to the argument that cross-listing improves the information environment, Foucault and Gehrig (2008) develop a new explanation for cross-listing, based on the idea that managers can make better investment decisions based on an information channel (e.g., Durnev et al., 2004; Luo, 2005; Chen et al., 2007; Bakke and Whited 2010). Managers of cross-listed firms are able to take advantage of the information conveyed in

their stock prices to make better investment decisions. Their theory implies that cross-listing improves the information channel and that this enhances firm value. Subsequently, Foucault and Frésard (2012) examine the theory using a large sample of 633 foreign cross-listed firms on US exchanges from 1989 to 2006, and they find that cross-listed firms have a higher investment-to-price sensitivity compared with non-cross-listed firms. They argue that the higher investment-to-price sensitivity of cross-listed firms is mainly driven by the greater informativeness of the stock prices of cross-listed firms. Also, they argue that the "learning hypothesis" developed by Foucault and Gehrig (2008) explains how cross-listing enables managers to obtain precise information from the stock market.

Recently, Abdallah and Abdallah (2019) investigate whether cross-listing improves firms' investment efficiency to test the learning hypothesis, namely the idea that the managers of cross-listed firms obtain more precise information from their stock prices, to guide their investments. They examine a sample of UK firms cross-listed on US stock exchanges from 2000 to 2014. They find that cross-listed firms improve their investment efficiency after cross-listing, especially those firms that cross-list in the OTC (over-the-counter) market. They measure investment efficiency by comparing the actual and expected levels of investment using a method employed by Richardson (2006) to estimate the expected investment. They find that the improvement in investment efficiency is weaker for firms that cross-list on regulated exchanges (NYSE, NASDAQ, and AMEX) compared to their peers that are listed on the OTC market. Moreover, they also find that firms with specific characteristics (i.e., low levels of private information, and high board independence) improve their investment efficiency after cross-listing. Similarly, Abdallah and Abdallah (2017) examine the learning channel using M&A data. They investigate whether a US listing improves the ability of managers of cross-listed firms to "listen to the market" in M&A deals. They define "listening to the market" as a situation where managers learn from stock prices, as explained by Kau et al. (2008). Namely, they measure "listening to the market" in two ways: if the CAR around the announcement date is more than 2.5% and the transaction is completed by managers, or the CAR is less than -2.5% and the transaction is cancelled by managers. Using a large sample of M&A deals by 641 cross-listed firms on US stock exchanges from 1980 to 2013, they find that cross-listing improves the ability of the managers of foreign firms to "listen to the market" in M&A deals. Also, they find that different levels of shareholder protection have different influences on "listening to the market". In particular, managers of cross-

listed firms from strong shareholder protection countries are more likely to "listen to the market", while firms from weak investor protection countries are less likely to "listen to the market".

Turning now to the second argument, that cross-listing improves corporate governance, McLean et al. (2012) investigate how an important aspect of corporate governance, the level of investor protection, influences firm-level capital allocations. They employ a large sample of firms from over 40 countries during the period between 1990 and 2007. They measure investor protection using several different approaches from the work of La Porta et al. (2006) and Djankov et al. (2008). They find that investor protection is associated with higher investment sensitivity to Tobin's Q and that lower investment sensitivity to cash flow is found in countries with stronger investor protection. Their findings broadly show that investor protection promotes accurate stock prices, efficient investments, and better access to external finance. Ghosh and He (2015) investigate the effect of cross-listing on investment decisions. They report that foreign firms cross-listed on US stock exchanges can improve corporate governance by following US laws, and thereby "bonding" with the US legal system. Cross-listing has a significant impact on capital expenditures, M&A decisions, and R&D investments. Also, they find that cross-listed firms are associated with better M&A decisions and higher profitability compared to their non-cross-listed peers in their home countries. Foreign firms cross-listed on US stock exchanges are associated with better cash utilization and higher investment efficiency, particularly for foreign firms from countries with weak investor protection. Overall, they argue that cross-listing contributes to better investment decisions and investment efficiency, which can improve the value of cross-listed firms.

On the other hand, investments could be influenced by whether a cross-listing eases access to external capital. Lins et al. (2005) study whether a US listing improves the ability of foreign firms to access external capital by reducing market segmentation costs. They examine a large sample of ADR firms on US stock exchanges between 1980 and 1996. They find that ADR firms from emerging markets obtain greater access to external capital after listing in the US compared with ADR firms from developed markets. They argue that ADR firms from emerging markets have more opportunities to access external capital because these firms improve the level of shareholder protection and liquidity compared with their peers in their home markets. Hail and Leuz (2009) find that cross-

listing reduces the cost of capital. They examine a large sample of ADR firms from 45 countries during the period between 1990 and 2005. They find that cross-listing on US exchanges significantly reduces the cost of capital more for ADR firms compared to other types of cross-listings (i.e., the OTC markets or private placements).

Turning now to the effect of cross-listing on the financing of M&A deals, two studies find that cross-listed firms enhance the proportion of equity financing in M&A deals (i.e., Tolmunen and Torstila, 2005; Kumar and Ramchand, 2008). Tolmunen and Torstila (2005) investigate the transatlantic evidence based on 547 European firms cross-listed on US stock exchanges from 1995 to 2000, and they report that these European firms are more likely to acquire US firms after cross-listing compared with their domestically listed peers. Also, they find that these European firms are more likely to enhance the proportion of M&A transactions financed with equity after cross-listing. Kumar and Ramchand (2008) argue that cross-listing increases the likelihood that acquirers' dominant shareholders voluntarily dilute their control to reduce acquisition costs. Empirically, they examine a sample of 364 cross-listed firms on US stock exchanges during the period between 1990 and 2003. They find that there is a strong impact of cross-listing on acquirers' dominant shareholders, as the proportion of cash payments decreases after cross-listing and the level of equity payments increases. However, Burns et al. (2007) find that firms cross-listed in the US rarely use equity in acquiring US targets compared with domestic US acquirers. Also, cross-listed firms from countries with poor legal protection need to pay a higher acquisition premium to acquire US targets, and they have fewer opportunities to obtain equity financing.

3.3. Sample selection and research method

3.3.1. Hong Kong-listed firms

The list of Chinese firms (H-share and Red chip) is provided by the official website of the Stock Exchange of Hong Kong (SEHK). Delisted Chinese firms (H-share and Red chip) for the study were obtained from annual SEHK Fact Books. To identify P chip firms traded on the Main Board of SEHK, the study employs two key criteria: (1) Geographical distribution of corporate headquarters ─ if a firm is headquartered in mainland China, it is classified as a P chip; (2) Geographic segments of a firm's assets and revenues ─ if a firm's revenue (100%) is derived from mainland China or a firm's

assets (100%) are located in mainland China, it is classified as a P chip. The data about corporate headquarters and geographic segments were collected from S&P Capital IQ. Also, the study obtained P chip information from the "Russell Global Index membership list". Similarly, data for delisted Chinese firms (P chip) were collected from annual SEHK Fact Books. The study starts in 2001 because the first P chip firm was listed on the Stock Exchange of Hong Kong (SEHK) in 2000.[52] The Hong Kong-listed sample includes Chinese firms on the Main Board of the SEHK from 01.2001 to 12.2015 that are covered by DataStream (i.e., firms for which data are available on DataStream). After excluding Chinese firms in the category of financial service[53], in total there are 142 Red chips, 167 H-shares and 460 P chips.

3.3.2. Domestically listed firms

The domestically listed sample is selected from Chinese firms domestically traded on the Shanghai Stock Exchange (SSE) or Shenzhen Stock Exchange (SZSE) as A-shares from 01.2001 to 12.2015 that are covered by DataStream. Chinese firms called "AH-shares[54]" are excluded from the domestically listed sample but included in the Hong Kong-listed sample. The data for delisted Chinese firms (A-share) were checked and collected using the statistical data from the official website of the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE). After excluding Chinese firms in the category of financial services, the domestically listed sample includes 1,512 Chinese firms (A-share). The domestically listed Chinese firms are employed as a control sample in the study.[55] As for these domestically listed Chinese firms, their accounting data and stock market data are based on the data from the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE). To sum up, there are 769 Hong Kong-listed firms and 1,512 domestically listed firms in the whole sample. The following table (Table 3.1) provides more details about the different categories of firms.

[52] *China through the mosaic of its share classes*. This 2016 FTSE Russell research is available at: https://www.ftserussell.com/files/research/china-through-mosaic-its-share-classes

[53] Real estate firms are not excluded.

[54] The AH-share firms are listed both in mainland China and in Hong Kong.

[55] The A-share is the main class of stock in mainland China and refers to stock traded on the Shanghai Stock Exchange or the Shenzhen Stock Exchange. Some studies employ A-shares as a control sample to examine foreign listings, for example Hung et al. (2012) and Ke et al. (2012).

Table 3.1 Hong Kong-listed firms and Domestically listed Chinese firms
This table reports all Chinese listed firms in the sample from 2001-2015. The different firm types are classified by the author.

Hong Kong listing	Number of firms	Domestic listing	Number of firms
H-share	167	*Shanghai (A-share)*	1,046
Red chip	142	*Shenzhen (A-share)*	466
P chip	460		
Total	769		1,512

3.3.3. Variables and empirical models

3.3.3.1. Hong Kong listing and investment efficiency

To examine the relation between Hong Kong listing and investment efficiency, this study employs the sensitivity of investment to investment opportunities (Tobin's Q) to measure investment efficiency (see e.g., Baker et al., 2003; Chen et al., 2011; McLean et al., 2012; Chen et al., 2017). The regression model used is based upon the methodology of previous studies (e.g., Chen et al, 2011; Foucault and Frésard, 2012; Chen et al, 2017). Specifically, it can be expressed in the following way:

$$Investment_{i,t} = \alpha + \beta_1 Hong\ Kong\ listing + \beta_2 Tobin's\ Q_{i,t-1} + \beta_3 Hong\ Kong\ listing \times Tobin's\ Q_{i,t-1} + \gamma_1 Cash\ ratio_{i,t-1} + \gamma_2 Leverage_{i,t-1} + \gamma_3 Stock\ Returns_{i,t-1} + \gamma_4 Investment_{i,t-1} + \gamma_5 Firm\ size_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

Where the dependent variable is the investment expenditure in a given year, which is measured by the ratio of capital expenditures (year *t*) scaled by lagged PPE (year *t-1*) for firm *i* in year *t*. *Hong Kong listing* is an independent variable and is also a dummy variable to identify whether a firm is a Hong Kong listing or not. For a firm that is a Hong Kong-listed firm, the value is equal to one, otherwise it is equal to zero. *Tobin's Q* $_{i,t-1}$ is an independent variable, and it represents investment opportunities. It is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. The control variables (i.e., *Cash ratio* $_{i,t-1}$, *Leverage* $_{i,t-1}$, *Stock Returns* $_{i,t-1}$, *Investment* $_{i,t-1}$ and *Firm size* $_{i,t-1}$) are also included in the model to control for other factors that may affect investment. The *Cash ratio* $_{i,t-1}$ represents the

level of cash and is measured as the ratio of cash and short term investments to total assets. The effect of leverage on investment is well-documented and is employed as a control variable in many studies (e.g., Richardson, 2006; Harford et al., 2008; Ghosh and He, 2015). *Leverage* $_{i,t-1}$ is also employed in the study and is measured as total debt over total assets. Similar to Richardson's (2006) model, *Stock Returns* $_{i,t-1}$ and *Investment* $_{i,t-1}$ are employed as control variables to capture the effect of prior stock market performance and prior firm-level investment. *Stock Returns* $_{i,t-1}$ is measured as the change in the yearly return index for firm *i* in year *t-1*. *Investment* $_{i,t-1}$ represents the total investment expenditure for firm *i* in year *t-1* and is measured by capital expenditures (year *t-1*) over lagged PPE (year *t-2*). Firm size is employed to control for the effect of firm size on investment decisions (e.g., Richardson, 2006; Harford et al., 2008; Ghosh and He, 2015). *Firm size* $_{i,t-1}$ is measured as the logarithm[56] of the total assets for firm *i* in year *t-1*.

The interaction between *Hong Kong listing* and *Tobin's Q* $_{i,t-1}$ represents investment efficiency, following the methodology used in previous studies (e.g., Chen et al, 2011; Chen et al, 2017). If the coefficient of the interaction term *Hong Kong listing* × *Tobin's Q* $_{i,t-1}$ is significantly positive, it can be argued that Hong Kong-listed firms are associated with higher investment efficiency than domestically listed firms. Otherwise, if the coefficient of the interaction term is significantly negative, it means that Hong Kong-listed firms are associated with lower investment efficiency than domestically listed firms.

3.3.3.2. Hong Kong listing and investment deviations

To investigate whether Hong Kong-listed Chinese firms are associated with underinvestment or overinvestment (Hypothesis 2 and Hypothesis 3), three subsamples were constructed (i.e., underinvestment, normal investment and overinvestment) from all firm-year observations. Richardson (2006) provides a method to decompose investment-related expenditure into expected investment expenditure and inefficient investment expenditure (underinvestment or overinvestment). Expected investment is a function of growth opportunities and other factors that may affect investment decisions. Following Richardson (2006), this study predicts the expected level of investment using the following model:

[56] The common logarithm is employed in the thesis.

$$Investment_{i,t} = \alpha + \beta_1 Tobin's\ Q_{i,t-1} + \beta_2 Cash\ ratio_{i,t-1} + \beta_3 Leverage_{i,t-1} + \beta_4 Stock\ Returns_{i,t-1} + \beta_5 Investment_{i,t-1} + \beta_6 Firm\ size_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

Where $Investment_{i,t}$ is the total investment expenditure for firm *i* in year *t*, which is measured by the ratio of capital expenditures and R&D (year *t*) scaled by lagged total assets (year *t-1*). $Tobin's\ Q_{i,t-1}$ is chosen to represent a firm's growth opportunity, which is the most widely used variable for the prediction of expected investments (e.g., Hubbard, 1998; Wang et al, 2020). Following Richardson (2006), some additional variables ($Cash\ ratio_{i,t-1}$, $Leverage_{i,t-1}$, $Stock\ Returns_{i,t-1}$, $Investment_{i,t-1}$ and $Firm\ size_{i,t-1}$) are included in the model. The definitions of the variables ($Tobin's\ Q_{i,t-1}$, $Cash\ ratio_{i,t-1}$, $Leverage_{i,t-1}$, $Stock\ Returns_{i,t-1}$ and $Firm\ size_{i,t-1}$) are the same definitions that are used for Equation (1). $Investment_{i,t-1}$ is the total investment expenditure for firm *i* in year *t-1*, which is measured by the ratio of capital expenditures and R&D (year *t-1*) scaled by lagged total assets (year *t-2*). In addition, the estimation of Equation (2) includes industry fixed effects.

The residuals of Equation (2) are defined as deviations from the expected investment following the approach of Biddle et al. (2009). Firm-year observations are sorted by the quartiles of residuals. For example, if firm-year observations are under the bottom quartile (less than 25%), they are defined as underinvestment; if firm-year observations are over the top quartile (more than 75%), they are defined as overinvestment; if firm-year observations are between the middle two quartiles (between 25% and 75%), they are defined as a normal investment (the benchmark group). The three groups of firm-year observations are employed as the dependent variables.

Furthermore, the study employs a logit model to examine whether Hong Kong-listed Chinese firms are associated with underinvestment or overinvestment compared with their domestically listed peers (Hypothesis 2 and Hypothesis 3). The logit models can be expressed as follows:

$$\Pr(Underinvestment_{i,t}) = \alpha + \beta\ Hong\ Kong\ listing + \gamma_1 P/E\ ratio_{i,t-1} + \gamma_2 Cash\ ratio_{i,t-1} + \gamma_3 Leverage_{i,t-1} + \gamma_4 Stock\ Returns_{i,t-1} + \gamma_5 Investment_{i,t-1} + \gamma_6 Firm\ size_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

$$\Pr(Overinvestment_{i,t}) = \alpha + \beta\ Hong\ Kong\ listing + \gamma_1\ P/E\ ratio_{i,t-1} + \gamma_2\ Cash\ ratio_{i,t-1} + \gamma_3\ Leverage_{i,t-1} + \gamma_4\ Stock\ Returns_{i,t-1} + \gamma_5\ Investment_{i,t-1} + \gamma_6\ Firm\ size_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

Where *Underinvestment* $_{i,t}$ is a dummy variable to identify whether the firm-year observations are under the bottom quartile (less 25%) or in the benchmark group (between 25% and 75%). If firm-year observations are under the bottom quartile, *Underinvestment* $_{i,t}$ is equal to one, otherwise it is equal to zero. Similarly, *Overinvestment* $_{i,t}$ is also a dummy variable, and if firm-year observations are over the top quartile (more than 75%), *Overinvestment* $_{i,}$t is equal to one, otherwise it is equal to zero when firm-year observations in the benchmark group. *Hong Kong listing* is an independent variable and is also a dummy variable to identify a firm whether it is Hong Kong-listed or not. If a firm is a Hong Kong-listed firm, the value is equal to one, otherwise it is equal to zero. As for control variables, these are: *P/E ratio* $_{i,t-1}$, *Cash ratio* $_{i,t-1}$, *Leverage* $_{i,t-1}$, *Stock Returns* $_{i,t-1}$, *Investment* $_{i,t-1}$ and *Firm size* $_{i,t-1}$. The *P/E ratio* $_{i,t-1}$ represents a firm's growth opportunity and is employed to control for the difference between the two stock markets (i.e., the Hong Kong stock market and the A-share market in mainland China). Specifically, the average P/E ratio of the Hong Kong stock market is lower than that of the A-share market.[57] For example, Sun et al. (2013) argue that the H-shares in the Hong Kong stock market are traded at substantial discounts relative to their A-share peers. That is, if a Chinese firm chooses to list in Hong Kong, the stock price is usually lower (undervalued) compared to the A-share market. Therefore, the *P/E ratio* $_{i,t-1}$ is included in Equation (3) and Equation (4) to control for the difference in the average P/E ratios as this may affect Chinese firms' levels of underinvestment or overinvestment. The *P/E ratio* $_{i,t-1}$ is computed as the stock price scaled by earnings per share yearly. The definition of the other variables (*Cash ratio* $_{i,t-1}$, *Leverage* $_{i,t-1}$, *Stock Returns* $_{i,t-1}$, *Investment* $_{i,t-1}$ and *Firm size* $_{i,t-1}$) are same as those used for Equation (1).

3.4. Main empirical results

This section describes the sample and empirical results. In this section, the hypotheses are examined using different models.

[57] The average P/E ratio is shown in the official website of the SEHK, and is available at: https://www.hkex.com.hk/Mutual-Market/Stock-Connect/Statistics/Hong-Kong-and-Mainland-Market-Highlights?sc_lang=en#select3=0&select2=3&select1=21

3.4.1. Descriptive statistics

The sample collects accounting variables and stock market variables from DataStream. The sample includes both Hong Kong-listed firms and domestically listed firms from 2001 to 2015. The sample excludes observations if market capitalization, total assets, capital expenditures, PPE (Property, plant, and equipment) and sales growth are missing. Table 3.2 presents the details of the descriptive statistics of the main variables used in the study as well as the distribution of observations before winsorization. Table 3.3 reports the mean difference between domestically listed firms and Hong Kong-listed firms. To reduce the effect of outliers, all variables are winsorized at the 1% and 99% levels in the regression analysis. All variables defined in this study are expressed in terms of the Chinese currency (Chinese Yuan Renminbi).

For Hong Kong-listed firms, the mean of *Investment* $_t$ and *Investment* $_{t-1}$ are smaller than for domestically listed firms, but the mean difference between the two variables is not significant. For other variables (i.e., *Tobin's Q* $_{i,t-1}$, *Cash ratio* $_{i,t-1}$, *Leverage* $_{i,t-1,}$ *Stock Returns* $_{i,t-1}$ and *Firm size* $_{i,t-1}$), there are clear mean differences between domestically listed firms and Hong Kong-listed firms. Based on the average of *Tobin's Q* $_{i,t-1}$, Hong Kong-listed firms are significantly smaller than domestically listed firms. As for the *Cash ratio* $_{t-1}$, the mean for Hong Kong-listed firms is significantly greater than that for domestically listed firms. The mean of Hong Kong-listed firms' leverage is a little smaller than domestically listed firms' leverage. As for the *Stock Returns* $_{i,t-1}$, the average of Hong Kong-listed firms' stock return is a little higher than that of domestically listed firms. Based on the average of *P/E ratio* $_{t-1}$, Hong Kong-listed firms are significantly smaller than domestically listed firms. The firm size of Hong Kong-listed firms is similar to that of domestically listed firms, but Hong Kong-listed firms are a little larger than domestically listed firms. Table 3.4 reports the Pearson Correlation matrix of the variables, and it shows a relatively low correlation between most of the independent variables.

Table 3.2 Descriptive statistics

This table reports the descriptive statistics of the sample used in the analysis. The sample includes both Hong Kong-listed firms and domestically listed firms from 2001 to 2015. All variables defined in this study are expressed in the Chinese currency (Chinese Yuan Renminbi). *Investment* $_{i,t}$ is measured by capital expenditures (year *t*) over lagged PPE (year *t-1*). *Investment* $_{i,t-1}$ is measured by capital expenditures (year *t-1*) over lagged PPE (year *t-2*). *Tobin's Q* $_{i,t-1}$ represents a firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. The *Cash ratio* $_{i,t-1}$ represents the level of cash and is measured as the ratio of cash and short term investments to total assets. *Leverage* $_{i,t-1}$ is measured as total debt over total assets. *Stock Returns* $_{i,t-1}$ is measured as the change in the yearly return index for firm *i* in year *t-1*. *P/E ratio* $_{i,t-1}$ is computed as the stock price scaled by earnings per share yearly. *Firm size* $_{i,t-1}$ is measured as the logarithm of the total assets for firm *i* in year *t-1*.

Panel A: Hong Kong listing						
VARIABLES	observations	mean	Std. Dev.	min	P50	max
Investment $_{t}$	6321	3.631	169.714	-0.052	0.178	13098.504
Investment $_{t-1}$	6320	3.839	170.392	-0.052	0.178	13098.504
Tobin's Q $_{t-1}$	6321	1.746	3.840	0.070	1.194	198.765
Cash ratio $_{t-1}$	6320	0.226	0.176	0.000	0.175	2.462
Leverage $_{t-1}$	6313	0.235	0.562	0.000	0.199	29.122
Stock Return $_{t-1}$	5409	0.189	1.067	-0.968	-0.007	32.157
P/E ratio $_{t-1}$	4597	23.515	159.127	0.000	12.300	9723.300
Firm size $_{t-1}$	6321	15.380	1.864	8.987	15.304	22.285
Panel B: Domestic listing						
VARIABLES	observations	mean	Std. Dev.	min	P50	max
Investment $_{t}$	15877	8.571	635.996	0.000	0.133	70737.445
Investment $_{t-1}$	15877	6.911	580.388	0.000	0.133	70737.445
Tobin's Q $_{t-1}$	15877	2.467	3.546	0.615	1.762	192.705
Cash ratio $_{t-1}$	15872	0.160	0.121	0.000	0.130	0.993
Leverage $_{t-1}$	15877	0.290	0.353	0.000	0.273	25.699
Stock Return $_{t-1}$	15489	0.134	0.679	-0.885	-0.041	17.016
P/E ratio $_{t-1}$	13051	165.776	4652.719	0.200	42.800	52020.188
Firm size $_{t-1}$	15877	14.797	1.275	8.030	14.719	21.048

Table 3.3 Mean difference between domestically listed firms and Hong Kong-listed firms

This table reports the descriptive statistics of the sample used in the analysis. The sample includes both Hong Kong-listed firms and domestically listed firms from 2001 to 2015. All variables defined in this study are expressed in the Chinese currency (Chinese Yuan Renminbi). *Investment* $_{i,t}$ is measured by capital expenditures (year *t*) over lagged PPE (year *t-1*). *Investment* $_{i,t-1}$ is measured by capital expenditures (year *t-1*) over lagged PPE (year *t-2*). *Tobin's Q* $_{i,t-1}$ represents a firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. The *Cash ratio* $_{i,t-1}$ represents the level of cash and is measured as the ratio of cash and short term investments to total assets. *Leverage* $_{i,t-1}$ is measured as total debt over total assets. *Stock Returns* $_{i,t-1}$ is measured as the change in the yearly return index for firm *i* in year *t-1*. *P/E ratio* $_{i,t-1}$ is computed as the stock price scaled by earnings per share yearly. *Firm size* $_{i,t-1}$ is measured as the logarithm of the total assets for firm *i* in year *t-1*.

Variables	Domestic listing		Hong Kong listing		t-test for difference in mean
	Observations	Mean	Observations	Mean	
Investment $_{t}$	15877	8.571	6321	3.631	4.940
Investment $_{t-1}$	15877	6.911	6320	3.839	3.072
Tobin's Q $_{t-1}$	15877	2.467	6321	1.746	0.721***
Cash ratio $_{t-1}$	15872	0.160	6320	0.226	-0.066***
Leverage $_{t-1}$	15877	0.290	6313	0.235	0.056***
Stock Return $_{t-1}$	15489	0.134	5409	0.189	-0.054***
P/E ratio $_{t-1}$	13051	165.776	4597	23.515	142.260**
Firm size $_{t-1}$	15877	14.797	6321	15.380	-0.583***

Table 3.4 Correlation coefficient matrix

This table reports the Pearson correlation for variables used in the analysis. *Investment* $_{i,t}$ is measured by capital expenditures (year *t*) over lagged PPE (year *t-1*). *Investment* $_{i,t-1}$ is measured by capital expenditures (year *t-1*) over lagged PPE (year *t-2*). *Hong Kong listing* is a dummy variable. If a firm is listed in Hong Kong, it is equal to one or otherwise zero. *Tobin's Q* $_{i,t-1}$ represents the firm's investment opportunity and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* $_{i,t-1}$ represents the level of cash and is measured as the ratio of cash and short term investments to total assets. *Leverage* $_{i,t-1}$ is measured as total debt over total assets. *Stock Returns* $_{i,t-1}$ is measured as the change in the yearly return index for firm *i* in year *t-1*. *P/E ratio* $_{i,t-1}$ is computed as the stock price scaled by earnings per share yearly. *Firm size* $_{i,t-1}$ is measured as the logarithm of the total assets for firm *i* in year *t-1*.

	Investment $_{t}$	*Investment* $_{t-1}$	*Hong Kong listing*	*Tobin's Q* $_{t-1}$	*Cash ratio* $_{t-1}$	*Leverage* $_{t-1}$	*Stock Return* $_{t-1}$	*P/E ratio* $_{t-1}$	*Firm size* $_{t-1}$
Investment $_{t}$	1.000								
Investment $_{t-1}$	0.188***	1.000							
Hong Kong listing	0.064***	0.060***	1.000						
Tobin's Q $_{t-1}$	0.164***	0.024***	-0.193***	1.000					
Cash ratio $_{t-1}$	0.165***	0.071***	0.209***	0.094***	1.000				
Leverage $_{t-1}$	-0.113***	-0.043***	-0.155***	-0.157***	-0.384***	1.000			
Stock Return $_{t-1}$	0.052***	0.046***	0.016**	0.267***	0.047***	-0.065***	1.000		
P/E ratio $_{t-1}$	-0.011	-0.031***	-0.228***	0.242***	-0.075***	0.034***	0.079***	1.000	
Firm size $_{t-1}$	-0.084***	0.028***	0.177***	-0.384***	-0.104***	0.196***	-0.014**	-0.252***	1.000

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3.4.2. Hong Kong listing and investment efficiency

Table 3.5 reports the main results of Equation (1) including fixed effects (industry and year) and presents the relation between Hong Kong listing and investment efficiency (Hypothesis 1). The standard errors are adjusted for heteroscedasticity using the method of Petersen (2009) for two dimensions (industry and year). In Column (1), the coefficient of *Tobin's Q* $_{t-1}$ is positive and significant, which is consistent with the results of previous studies (e.g., Baker et al., 2003; Chen et al., 2007) and shows that corporate investment is positively and significantly related to investment opportunities. In line with the results of Table 3.2, as the average (*Tobin's Q* $_{t-1}$) in Panel A is 1.746, the average marginal effect of a Hong Kong listing on investments is positive on average and is equal to:

$$\beta_1 + \beta_3 \times \text{Average } (\textit{Tobin's Q}_{t-1}) = -0.007 + 0.052 \times 1.746 = 0.084$$

where β_1 is the coefficient of *Hong Kong listing* and β_3 is the coefficient of the interaction term *Hong Kong listing* × *Tobin's Q* $_{t-1}$. Therefore, other things considered equal, the investment (capital expenditure) of the average Hong Kong-listed Chinese firm is 0.084 larger than that of the average investment by their domestically listed peers, i.e., the ratio of capital expenditure to lagged PPE is 8.4% greater for Hong-Kong listed firms. The study focuses on the coefficient of the key interaction term *Hong Kong listing* × *Tobin's Q* $_{t-1}$. Based on Hypothesis 1, if a Hong Kong listing increases investment efficiency, the key interaction term *Hong Kong listing* × *Tobin's Q* $_{t-1}$ is positive and significant. The findings show that the coefficient of the key interaction term *Hong Kong listing* × *Tobin's Q* $_{t-1}$ is positive and significant at the 0.01 level. This indicates that a Hong Kong listing increases Chinese firms' ability to make investments based on their investment opportunities (Tobin's Q). That is, Chinese firms listed in Hong Kong improve their investment efficiency compared to their domestically listed peers.

A possible explanation is that agency costs in Chinese firms are reduced after a Hong Kong listing. The implication is that the bonding effect improves Chinese firms' investment efficiency. [58] If Hong Kong-listed Chinese firms successfully bond themselves to Hong Kong's well-established legal system, managers of Hong Kong-listed Chinese firms have fewer opportunities to pursue their private benefits, which contributes to more efficient investment decisions. This finding is consistent with

[58] The legal systems of mainland China and Hong Kong are very different. Allen et al. (2005) report that there are significant differences in the rule of law between Hong Kong and mainland China. Foucault and Frésard (2012) also address the legal bonding effect as an alternative explanation in their study.

previous studies that argue that investor protection improves firms' investment efficiency. McLean et al. (2012) find that investor protection is associated with higher investment sensitivity to Tobin's Q in countries with stronger investor protection. Ghosh and He (2015) argue that investment efficiency is improved as a result of better cash utilization by cross-listed firms, and improved investor protection due to cross-listing has a positive impact on investment decisions and investment efficiency. Again, the possible explanation of lower agency costs due to a bonding effect arising from a Hong Kong listing needs to be tested empirically.

As for the control variables in Column (1), the coefficient of the *Cash ratio* $_{t-1}$ is positive and significant at the 0.01 level. This suggests that cash holding positively influences corporate investment. The coefficient of *Leverage* $_{t-1}$ is negative and significant at the 0.01 level, which shows that leverage negatively affects corporate investment. The coefficient of *Investment* $_{t-1}$ is positive and significant at the 0.01 level. It indicates that previous years of investment will affect investment in the following year. Also, the coefficient of *Firm size* $_{t-1}$ is negative and significant at the 0.01 level, consistent with Foucault and Frésard (2012). *Stock Returns* $_{i,t-1}$ does not have a significant coefficient. The results suggest that a Hong Kong listing improves the investment efficiency of Chinese firms.

Table 3.5 Hong Kong listing and investment efficiency

This table reports the results of Equation (1) using OLS estimation that includes fixed effects (year and industry). The dependent variable *Investment* $_{i,t}$ is measured by capital expenditures (year *t*) over lagged PPE (year *t-1*). *Hong Kong listing* is a dummy variable: if a firm is listed in Hong Kong, it is equal to one or otherwise zero. *Tobin's Q* $_{i,t-1}$ represents the firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* $_{i,t-1}$ represents the level of cash and is measured as the ratio of cash and short term investments to total assets. *Leverage* $_{i,t-1}$ is measured as total debt over total assets. *Stock Returns* $_{i,t-1}$ is measured as the change in the yearly return index for firm *i* in year *t-1*. *Investment* $_{i,t-1}$ represents the total investment expenditure for firm *i* in year *t-1* and is measured by capital expenditures (year *t-1*) over lagged PPE (year *t-2*). *Firm size* $_{i,t-1}$ is measured as the logarithm of the total assets for firm *i* in year *t-1*. The period of the sample is from 2001 to 2015. All variables are winsorized at the 1% and 99% levels. The robust t-statistics in parentheses are clustered by firm and year (two dimensions) to adjust for heteroscedasticity. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Full sample	Non-P chips vs. A-shares	P chips vs. A-shares
	(1)	(2)	(3)
Hong Kong listing	-0.007	-0.020	0.011
	(-0.27)	(-0.58)	(0.30)
Tobin's Q $_{t-1}$	0.053***	0.057***	0.053***
	(7.47)	(7.96)	(7.21)
Hong Kong listing × *Tobin's Q* $_{t-1}$	0.052***	0.026	0.067***
	(2.89)	(1.04)	(2.79)
Cash ratio $_{t-1}$	0.508***	0.493***	0.504***
	(8.52)	(7.87)	(7.72)
Leverage $_{t-1}$	-0.127***	-0.128***	-0.119***
	(-3.98)	(-4.11)	(-3.48)
Stock returns $_{t-1}$	-0.011	0.011	-0.009
	(-0.87)	(0.82)	(-0.60)
Investment $_{t-1}$	0.188***	0.183***	0.198***
	(11.11)	(9.86)	(10.53)
Firm size $_{t-1}$	-0.017***	-0.003	-0.012**
	(-3.89)	(-0.57)	(-2.22)
Constant	0.230***	0.012	0.162
	(2.72)	(0.14)	(1.54)
Observations	20,885	18,362	18,007
R-squared	0.099	0.095	0.106
Industry FE	YES	YES	YES
Year FE	YES	YES	YES

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

To examine the different effects of a Hong Kong listing on three categories of Chinese firms, Table 3.5 provides the findings for the sub-samples. Column (2) reports the results of non-P chips (H-shares and Red chips) compared with A-shares. The findings of Column (2) show that the coefficient of the key interaction term *Hong Kong listing* × *Tobin's Q* $_{t-1}$ is not significant. Column (3) reports the results of P chips compared with A-shares. The findings of Column (3) show that the coefficient of the key interaction term *Hong Kong listing* × *Tobin's Q* $_{t-1}$ is positive and significant at the 0.01 level. This indicates that a Hong Kong listing increases P chip firms' ability to make investments based on their investment opportunities (Tobin's Q). It therefore seems that the ability of a Hong Kong listing to increase Chinese firms' abilities to make investments based on their investment opportunities is driven by P chip firms. Chen et al. (2011) and Chen et al. (2017) argue that government ownership has a negative impact on investment efficiency. The findings do not show that a Hong Kong listing improves the investment efficiency of non-P chips. The possible explanation for this is the extent of government ownership of non-P chip firms and their political connections to the Chinese government. The current study finds that non-P chip firms do not change their investment behaviour after listing in Hong Kong. In contrast, the findings reported here show that Chinese privately-owned firms increase their investment efficiency after a Hong Kong listing. The findings of the current study clearly suggest that a Hong Kong listing has different impacts on different categories of Chinese firms.

3.4.3. Hong Kong listing and investment deviations

Table 3.6 reports the results of Equation (3) and (4) using the logit model to examine whether Hong Kong-listed Chinese firms are associated with underinvestment or overinvestment (Hypothesis 2 and Hypothesis 3). In all models, the standard errors are adjusted for heteroscedasticity using within-firm clustering following the approach of Petersen (2009). From Column (1), it is evident that the coefficient of *Hong Kong listing* is negative and significant at the 0.01 level. This indicates that Hong Kong-listed Chinese firms are not associated with underinvestment compared with their domestically listed peers. Underinvestment is caused by information asymmetry between managers and investors according to Myers and Majluf (1984). This information asymmetry between managers and investors can be mitigated if Chinese firms are listed in the Hong Kong stock market, which contributes to more efficient investment decisions (i.e., avoiding underinvestment). Additionally, a Hong Kong listing may also improve Chinese firms'

abilities to obtain external capital through diversified financing methods in Hong Kong, which could also explain why Chinese firms listed in Hong Kong are not associated with underinvestment. For example, Hong Kong-listed Chinese firms can take advantage of the enhanced visibility and prestige associated with a Hong Kong listing to issue stock to more easily raise capital in the mainland Chinese stock market at inflated prices and favourable terms (Busaba et al., 2015). Yang and Lau (2006) empirically find that Hong Kong-listed Chinese firms are less financially constrained, which can be explained by Chinese firms having an advantage in terms of raising external financing if they list in Hong Kong.

As for control variables of Column (1), the coefficient of the *P/E ratio* $_{i,t-1}$ is positive and significant at 0.01 level, and it suggests that firms with high growth opportunities are not associated with underinvestment. The coefficient of the *Cash ratio* $_{i,t-1}$ is positive and significant at the 0.01 level, suggesting that high cash holdings are not associated with underinvestment. The coefficient of *Leverage* $_{t-1}$ is negative and significant at the 0.01 level, which indicates that firms with higher leverage are not associated with underinvestment. The coefficient of *Stock Returns* $_{i,t-1}$ is positive and significant at the 0.01 level, which suggests that firms with better stock returns are not associated with underinvestment. The coefficient of *Firm size* $_{t-1}$ is negative and significant at the 0.01 level, which indicates that larger firms are not associated with underinvestment. For Column (2) of Table 3.6, it is expected that the coefficient of *Hong Kong listing* is negative and significant. However, the coefficient of *Hong Kong listing* is positive and not statistically significant, and so it is not possible to draw any conclusions. Overall, the findings suggest that Hong Kong-listed Chinese firms are not associated with underinvestment.

Table 3.6 Hong Kong listing and investment deviation

The table presents the results of Equation (3) and (4) using the logit model that includes industry fixed effects. Column (1) reports the results of underinvestment firm-year observations and normal investment firm-year observations. Column (2) reports the results of overinvestment firm-year observations and normal investment firm-year observations. *Underinvestment* $_{i,t}$ is the dependent variable and a dummy variable to identify whether the firm-year observation is under the bottom quartile (less 25%) or in the benchmark group (between 25% and 75%). If firm-year observations are under the bottom quartile, *Underinvestment* $_{i,t}$ is equal to one, otherwise it is equal to zero. *Overinvestment* $_{i,t}$ is the dependent variable and also a dummy variable, and if firm-year observations are over the top quartile (more than 75%), *Overinvestment* $_{i,t}$ is equal to one, otherwise it is equal to zero when firm-year observations in the benchmark group. *Hong Kong listing* is the independent variable and a dummy variable. If a firm is a Hong Kong listing, it is equal to one or otherwise zero. As for control variables, there are *P/E ratio* $_{i,t-1}$, *Cash ratio* $_{i,t-1}$, *Leverage* $_{i,t-1}$, *Stock Returns* $_{i,t-1}$, *Investment* $_{i,t-1}$ and *Firm size* $_{i,t-1}$. *P/E ratio* $_{i,t-1}$ represents the firm's growth opportunity and is computed as stock price scaled by earnings per share yearly. The other control variables are the same measure as Equation (1). The period of the sample is from 2001 to 2015. All variables are winsorized at levels 1% and 99%. The robust z-statistics in parentheses are clustered by the firm to adjust for heteroscedasticity. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	*Underinvestment* $_t$ (Underinvest vs. normal invest)	*Overinvestment* $_t$ (Overinvest vs. normal invest)
	(1)	(2)
	Logit	Logit
Hong Kong listing	-0.260***	0.042
	(-3.75)	(0.67)
P/E ratio $_{t-1}$	0.001***	-0.000
	(6.29)	(-1.36)
Cash ratio $_{t-1}$	1.929***	0.394*
	(8.70)	(1.96)
Leverage $_{t-1}$	-1.245***	-0.536***
	(-6.90)	(-3.51)
Stock Return $_{t-1}$	0.175***	0.111***
	(5.11)	(3.44)
Investment $_{t-1}$	6.748***	9.321***
	(17.97)	(21.27)
Firm size $_{t-1}$	-0.342***	-0.167***
	(-13.66)	(-8.10)
Constant	3.554***	1.323***
	(7.81)	(3.99)
Observations	12,713	13,172
Pseudo R^2	0.170	0.097
Industry FE	YES	YES

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

3.5. Robustness checks and additional tests

In this section, two different methods are used to examine the robustness of the main results. First, this study uses two alternative measures of investment to test Equation (1). Second, to correct for self-selection bias within the sample, the Heckman two-stage estimation is employed.

3.5.1. Hong Kong listing and investment efficiency (alternative measures of investment)

To check the results shown in Table 3.5, the study employs two alternative measures of investment. Table 3.7 reports the result of the robustness checks. All models include fixed effects (industry and year), and the standard errors of all models are adjusted for heteroscedasticity using the method of Petersen (2009) for two dimensions (industry and year). In Column (1), *Investment* $_{i,t}$ is measured as capital expenditures plus R&D (year *t*) over lagged PPE (year *t-1*). The coefficient of the key interaction term *Hong Kong listing* $\times$ *Tobin's Q* $_{t-1}$ is positive and significant at 0.01 level, which is consistent with the result in Table 3.5. In Column (2), another alternative measure of investment is used to check the robustness. That is, *Investment* $_{i,t}$ is measured as capital expenditures (year *t*) over lagged total assets (year *t-1*). In this case, the coefficient of the key interaction term *Hong Kong listing* $\times$ *Tobin's Q* $_{t-1}$ is positive but is only significant at the 0.10 level, which is also consistent with the result in Table 3.5.

Table 3.7 Hong Kong listing and investment efficiency (Alternative measures of investment)
This table reports the results of Equation (1) using OLS estimation that includes fixed effects (year and industry). In Column (1), *Investment* $_{i,t}$ is measured by capital expenditures plus R&D (year *t*) over lagged PPE (year *t-1*). In Column (2), *Investment* $_{i,t}$ is measured by capital expenditures (year *t*) over lagged total assets (year *t-1*). *Hong Kong listing* is the independent variable and a dummy variable. If a firm is a Hong Kong listing, it is equal to one or otherwise zero. *Tobin's Q* $_{i,t-1}$ represents the firm's investment opportunity and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* $_{i,t-1}$ represents the level of cash and is measured as the ratio of cash & short term investments to total assets. *Leverage* $_{i,t-1}$ is measured as total debt over total assets. *Stock Returns* $_{i,t-1}$ is measured as the change in the yearly return index for firm *i* in year *t-1*. In Column (1), *Investment* $_{i,t-1}$ represents the total investment expenditure for firm *i* in year *t-1* and is measured by capital expenditures plus R&D (year *t-1*) over lagged PPE (year *t-2*). In Column (2), *Investment* $_{i,t-1}$ represents the total investment expenditure for firm *i* in year *t-1* and is measured by capital expenditures (year *t-1*) over lagged total assets (year *t-2*). *Firm size* $_{i,t-1}$ is measured as the logarithm of the total assets for firm *i* in year *t-1*. The period of the sample is from 2001 to 2015. All variables are winsorized at levels 1% and 99%. The robust t-statistics in parentheses are clustered by firm and year (two dimensions) to adjust for heteroscedasticity. *, ** , *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Capital expenditures plus R&D/lagged PPE	Capital expenditures/lagged total assets
	(1)	(2)
	Investment $_t$	*Investment* $_t$
Hong Kong listing	-0.018	0.001
	(-0.56)	(0.43)
Tobin's Q $_{t-1}$	0.059***	0.005***
	(7.14)	(8.77)
Hong Kong listing × *Tobin's Q* $_{t-1}$	0.071***	0.002*
	(3.42)	(1.70)
Cash ratio $_{t-1}$	0.562***	0.019***
	(8.30)	(4.11)
Leverage $_{t-1}$	-0.173***	-0.018***
	(-4.77)	(-6.01)
Stock returns $_{t-1}$	-0.010	0.002*
	(-0.64)	(1.80)
Investment $_{t-1}$	0.220***	0.420***
	(12.07)	(40.87)
Firm size $_{t-1}$	-0.021***	-0.000
	(-4.08)	(-0.72)
Constant	0.253***	0.029***
	(2.62)	(3.83)
Observations	20,885	20,885
R-squared	0.130	0.271
Industry FE	YES	YES
Year FE	YES	YES

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

3.5.2. Self-selection bias

This study employs the Heckman (1979) two-stage estimation model to correct for self-selection bias. Non-random sample selection (i.e., self-selection bias) is a specific type of endogeneity, which can be viewed as a form of omitted-variables bias. Self-selection bias may arise when the treatment group and control group are not randomly chosen from the same population. In this study, the treatment group includes Hong Kong-listed firms and the control group includes domestically listed firms. Because the Hong Kong-listed sample is not randomly selected from the same population (Chinese firms listed in Hong Kong or mainland China), a potential selection bias must be seriously considered. In other words, Chinese firms that make the decision to list in Hong Kong are a self-selected group, and biased results could arise when using a dummy variable (i.e., Hong Kong listing) to examine the effect of Hong Kong listings. To correct for self-selection bias, a Heckman (1979) two-step estimation method is employed, in line with Doidge et al. (2004), Tolmunen and Torstila (2005) and Foucault and Frésard (2012). The first equation of the Heckman (1979) two-step estimation method is a probit model with industry fixed effects that estimates the likelihood of a Hong Kong listing and produces the inverse Mills ratio (Lambda). The inverse Mills ratio (Lambda) must be generated from the estimation of a probit model; a logit model cannot be used. The first step is to estimate the mechanism of Hong Kong listings using a probit model with some firm-level variables. The probit model is used to examine the likelihood of a Chinese firm being Hong Kong-listed. To construct the probit model, the firm-level variables chosen are *ROA*, *P/E ratio*, *Sales growth*, *Leverage* and *Firm size*. These firm-level variables are included in the first stage of the estimation control for factors that may influence a Hong Kong listing decision. The first stage is the estimation of the following model:

$$\Pr(\textit{Hong Kong listing}) = \alpha + \beta_1 \textit{ROA} + \beta_2 \textit{P/E ratio} + \beta_3 \textit{Sales growth} + \beta_4 \textit{Leverage} + \beta_5 \textit{Firm size} + \varepsilon \quad (5)$$

Where *Hong Kong listing* is the dependent variable and is also a dummy variable to identify whether a firm has a Hong Kong listing or not. For a firm that is a Hong Kong-listed firm, the value is equal to one, otherwise it is equal to zero. Pagano et al. (2002) argue that a firm lists its shares in international capital markets to obtain foreign capital to meet growing demand. *ROA* and *Sales growth* are related to a firm's growing demand, with higher *ROA* and *Sales growth* inducing a firm to list abroad. *ROA* is defined as the

sum of earnings before interest, taxes, depreciation, and amortization over total assets. *P/E ratio* represents a firm's growth opportunity and is computed as the stock price scaled by earnings per share yearly. *Sales growth* is measured by net sales in year *t* minus net sales in year *t-1* scaled by net sales in year *t-1*. *Leverage* is measured as total debt divided by total assets. As the firm size is also an important factor for a Hong Kong listing, with Pagano et al. (2002) finding that large firms are more likely to list abroad, *Firm size* is also included and is measured as the logarithm of total assets.

The second stage of the Heckman (1979) two-step estimation method is an OLS estimation with industry fixed effects to examine the relation between a Hong Kong listing and investment efficiency after adding the inverse Mills Ratio (Lambda) to the equation. The inverse Mills ratio (Lambda) is generated from the probit model estimation in the first stage and as an additional control variable in the second stage estimation. If the coefficient of the inverse Mills ratio (Lambda) is significant, and the coefficient of key variables is similar to the model that is examined, the Heckman correction shows that there is self-selection bias in the treated group (the Hong Kong-listed sample). If the inverse Mills ratio (Lambda) is not significant, and the coefficient of key variables is similar to the model that is examined, in this case, the sample selection of the treated group is assumed to be a random selection from the population. The second stage of the Heckman (1979) two-step estimation method is the following model:

$$\textit{Investment}_{i,t} = \alpha + \beta_1 \textit{ Hong Kong listing} + \beta_2 \textit{ Tobin's Q}_{i,t-1} + \beta_3 \textit{ Hong Kong listing} \times \textit{Tobin's Q}_{i,t-1} + \gamma_1 \textit{ Cash ratio}_{i,t-1} + \gamma_2 \textit{ Leverage}_{i,t-1} + \gamma_3 \textit{ Stock Returns}_{i,t-1} + \gamma_4 \textit{ Investment}_{i,t-1} + \gamma_5 \textit{ Firm size}_{i,t-1} + \gamma_6 \textit{ Inverse Mills Ratio (Lambda)} + \varepsilon_{i,t} \quad (6)$$

Where the dependent variable, independent variables and control variables are the same as Equation (1). The difference between Equation (1) and Equation (6) is that there is a new control variable, the Inverse Mills Ratio (Lambda) added in Equation (6). The inverse Mills Ratio (Lambda) is computed from a probit model in the first stage and participates in the second stage estimation.

Table 3.8 Heckman two-stage estimation

This table presents the results of Equation (1) using the Heckman two-stage estimation. Column (1) presents the results of the first stage (probit estimation with industry fixed effects), where *Hong Kong listing* is the dependent variable, measured as a dummy variable to identify whether a Chinese firm lists in Hong Kong or not. The probit estimation includes firm-level independent variables (*i.e., ROA, P/E ratio, Sales growth, Leverage, Firm size*). Column (2) reports the results of the second stage (OLS estimates with industry fixed effects), where *Investment* $_{i,t}$ is the dependent variable and *Hong Kong listing* is the independent variable. The second stage estimation uses the same control variables of Equation (1) except *Inverse Mills Ratio (i.e., Lambda)*, namely *Cash ratio* $_{i,t-1}$, *Leverage* $_{i,t-1}$, *Stock Returns* $_{i,t-1}$, *Investment* $_{i,t-1}$, *Firm size* $_{i,t-1}$. The *Inverse Mills Ratio* is computed from the first stage and participates in the second stage estimation as an additional control variable. The period of sample is from 2001 to 2015. All variables are winsorized at levels 1% and 99%. The z-statistics are reported in parentheses. *, * *, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Heckman	
	First-Stage (Probit)	Second Stage
Hong Kong listing		0.554**
		(2.43)
Tobin's Q $_{t-1}$		0.046***
		(5.22)
Hong Kong listing × *Tobin's Q* $_{t-1}$		0.022***
		(7.82)
Cash ratio $_{t-1}$		0.382***
		(5.61)
Leverage $_{t-1}$		-0.067
		(-1.01)
Stock returns $_{t-1}$		-0.033**
		(-2.36)
Investment $_{t-1}$		0.170***
		(12.95)
Firm size $_{t-1}$		-0.028***
		(-4.66)
ROA	-1.060***	
	(-5.77)	
P/E ratio	-0.011***	
	(-39.13)	
Sales growth	0.009	
	(0.47)	
Leverage	-1.490***	
	(-18.31)	
Firm size	0.107***	
	(17.65)	
Inverse Mills Ratio		-0.015
		(-0.81)
Observations	16,672	16,672
Industry FE	YES	YES

z-statistics in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 3.8 reports the results of the Heckman correction. Column (1) presents the results of the first stage (probit estimation) to examine why Chinese firms choose to list in Hong Kong. In the probit estimation, *Hong Kong listing* is the dependent variable and is a dummy variable. The probit estimation includes firm-level independent variables (*i.e., ROA*, *P/E ratio*, *Sales growth*, *Leverage*, *Firm size*). The coefficient of *ROA* is negative and significant at the 0.01 level. The coefficient of the *P/E ratio* is also negative and significant at the 0.01 level. Furthermore, the coefficient of *Leverage* is also negative and significant at the 0.01 level. The coefficient of *Firm size* is positive and significant at the 0.01 level. Column (2) reports the results equation (6) of the second stage. The second stage uses the same dependent variable, independent variables, and control variables as in Equation (1) and includes a new control variable *Inverse Mills Ratio (Lambda)*. In Column (2), the coefficient of the key interaction term *Hong Kong listing* × *Tobin's Q* $_{t-1}$ and the coefficient of *Inverse Mills Ratio (Lambda)* is focused on at the same time. the coefficient of the key interaction term *Hong Kong listing* × *Tobin's Q* $_{t-1}$ is positive and significant at the 0.01 level, which is consistent with the results in Table 3.5. At the same time, the *Inverse Mills Ratio (Lambda)* is also not significant. Therefore, the Heckman correction suggests that the selection of Hong Kong-listed firms does not exhibit self-selection bias and is assumed as a random sample selection.

3.5.3. Hong Kong listing and the learning channel

The findings of section 3.4 suggest that a Hong Kong listing improves Chinese firms' investment efficiency. The findings seem to be driven by a learning channel in which information asymmetry between managers and investors could be mitigated by a Hong Kong listing because of higher disclosure requirements. For example, the key interaction term *Hong Kong listing* × *Tobin's Q* $_{t-1}$ has a positive and significant coefficient, which indicates that Hong Kong-listed Chinese firms have a higher investment-to-price sensitivity compared to their domestically listed peers. This could be explained by the theory proposed by Foucault and Gehrig (2008) which argues that a foreign listing enables firms to learn from their newly listed stock prices and so improve subsequent corporate investments. The improved informativeness of stock prices could help managers make better investments in a more transparent stock market. Compared to the mainland Chinese stock market, the Hong Kong stock market is more mature and transparent. This could mitigate information asymmetry between managers and

investors. A study by Wang et al. (2009) finds that the Chinese A-share market conveys little information. However, Kot and Tam (2016) argue that the stock prices of Hong Kong-listed Chinese firms (H-share firms) become more informative. Also, Yang and Lau (2006) find that Hong Kong-listed Chinese firms have a better information environment as they experience greater analyst coverage. The possible reason why a Hong Kong listing improves Chinese firms' information environment is that the higher listing standards in Hong Kong prompt Chinese firms to disclose enough information to satisfy investors. Also, investors' ability to use information is another reason prompting Chinese firms to provide firm-specific information disclosure for investors (Li et al., 2015). Therefore, the greater investment efficiency of Chinese firms listed in Hong Kong could be explained by an improved information channel. Furthermore, the possible explanation of an improved information channel needs to be tested empirically, using appropriate data and research methods.

One possible way to test if a Hong Kong listing improves the information channel is to compare the year-by-year evolution of the investment-to-price sensitivity for each Hong Kong-listed Chinese firm. That is, for the same Chinese firm, data would be collected to compare the investment-to-price sensitivity before a Hong Kong listing and after a Hong Kong listing. If the same Chinese firm has a higher investment-to-price sensitivity after a Hong Kong listing than before a Hong Kong listing (i.e., listing in mainland China) this would suggest an improved learning channel, because the investment is more sensitive to stock prices. However, to make this comparison, market data (i.e., Tobin's Q) would need to be collected. The key difficulty in making such tests is that very few of the Hong Kong-listed Chinese firms have any listing record in China before a Hong Kong listing. Most Chinese firms that choose to list in Hong Kong do not have any prior listing record in mainland Chinese stock markets. Therefore, it is not possible in practical terms to compare the year-by-year evolution of the investment-to-price sensitivity for each Hong Kong-listed Chinese firm. In addition, and more importantly, it is difficult to directly test this prediction because we cannot isolate the information that is learned by managers directly from stock prices. Also, it is difficult to exclude the effect of other factors that may affect investments, for example, a bonding effect.

Another possible way to test for an improved information channel is to compare the year-by-year evolution of analyst coverage for each Hong Kong-listed Chinese firm. That is,

for the same Chinese firm, data on analyst coverage before a Hong Kong listing and after a Hong Kong listing would be collected and compared. If the same Chinese firm has a greater analyst coverage after a Hong Kong listing rather than before a Hong Kong listing (i.e., listing in mainland China) this would suggest an improved information channel because of greater analyst coverage. However, as already noted, very few Hong Kong-listed Chinese firms in the sample have any listing record before their Hong Kong listing. Therefore, minimal data about analyst coverage is available before they list in Hong Kong (i.e., when they are listed in mainland China). Therefore, there are practical impediments to comparing the year-by-year evolution of analyst coverage for each Hong Kong-listed Chinese firm. In addition, although greater analyst coverage implies that Chinese firms have a better information environment, we still do not know whether managers use the new information in their investment decisions.

3.6. Conclusion

This study investigates whether a Hong Kong listing improves Chinese firms' investment efficiency. Firstly, the study examines whether the investments of Hong Kong-listed Chinese firms have a higher sensitivity to investment opportunities (Tobin's Q) than their domestically listed peers. Using a large sample of Chinese listed firms from 2001 to 2015, the study finds that Hong Kong-listed Chinese firms have a higher investment-to-Q sensitivity than their domestically listed peers. This suggests that a Hong Kong listing improves Chinese firms' ability to make investments based on their investment opportunities (Tobin's Q). That is, Hong Kong-listed Chinese firms improve their investment efficiency compared to their domestically listed peers. Specifically, only Chinese P chip firms (i.e., privately-owned firms) increase their investment efficiency after a Hong Kong listing. Secondly, the study examines whether Hong Kong-listed Chinese firms are associated with underinvestment or overinvestment compared with their domestically listed peers. The findings show that Hong Kong-listed Chinese firms are not associated with underinvestment compared to their domestically listed peers. Underinvestment is caused by information asymmetry between managers and investors according to Myers and Majluf (1984). This suggests that information asymmetry between managers and investors could therefore be mitigated by a Hong Kong listing. Therefore, Hong Kong-listed Chinese firms could make more efficient investment decisions by avoiding underinvestment.

Information asymmetry and agency problems are two main frictions that affect firm-level investment efficiency (Stein, 2003). These findings imply that a Hong Kong listing has an impact on information asymmetry and agency problems. One explanation is that Chinese firms' stock prices become more informative after a Hong Kong listing, due to an improved information channel provided by the Hong Kong stock market. Therefore, managers could learn from their stock prices to make better investment decisions through the improved information channel. Another explanation is that agency costs in Chinese firms are reduced after a Hong Kong listing. Hong Kong's well-established legal system provides greater investor protection than the Chinese legal system according to the bonding hypothesis (Coffee, 1999 and Stulz, 1999). Therefore, managers have less opportunity to make worse investment decisions. However, the present study does not explicitly examine the improved information channel, and leaves this to be tested in future studies.

Chapter 4 Hong Kong Listing and Acquisition Decision Making

4.1. Introduction

There has been a tendency for Chinese firms to list on overseas stock exchanges in the past two decades, and Hong Kong has emerged as the first choice for Chinese firms (Pan and Brooker, 2014). The Stock Exchange of Hong Kong (SEHK) is a leading stock exchange in the world and the fastest-growing stock exchange in Asia (Karolyi, 2012). If Chinese firms are listed on the SEHK they will obtain benefits as Hong Kong is an important international financial centre that provides multiple financing channels. Hong Kong-listed Chinese firms will improve their credibility and prestige because the Stock SEHK has higher accounting, legal, and governance standards compared to the two stock exchanges in mainland China. The Hong Kong stock market has a better information environment than mainland Chinese stock markets due to strict legal supervision. This study investigates whether a Hong Kong listing influences Chinese firms' acquisition behaviour. That is, does a Hong Kong listing enable Chinese firms to make more subsequent acquisitions than domestically listed Chinese firms? Does a Hong Kong listing improve Chinese firms' ability to make successful acquisitions? Furthermore, do managers of Chinese firms make acquisition decisions based on the informational feedback from their stock prices?

There are competing theories in the academic literature about whether managers learn from stock prices. Dow and Gorton (1997) argue that managers can learn from the information conveyed by stock prices to make better corporate investments. However, Roll (1986) states that managers may neglect market signals due to hubris in takeovers. The managerial learning hypothesis shows that managers can learn from the information incorporated in stock prices to guide their real decisions (e.g., Dow and Gorton, 1997; Subrahmanyam and Titman, 1999). The managerial learning hypothesis is based on the information asymmetry between managers and stock market traders. Stock market traders have information that managers do not have, and that information is incorporated in stock prices. Managers can extract some information from stock prices to help their decisions. Jiang et al. (2011) find that the agency problem plays an important role in the process of managers learning from stock prices. The agency problem negatively affects

the learning channel between managers and stock prices. Kau et al. (2008) report that managers learning from their stock prices ("listening to the market"[59]) is related to agency costs. They find that managers learn from their stock prices when firms are held by large blockholders, or when CEOs have higher pay-performance sensitivities.

There is no clarity on whether a foreign listing enables managers to make good investment decisions by learning from stock prices. Foucault and Gehrig (2008) develop a theoretical model that shows that cross-listing improves managers' ability to obtain information from stock prices to guide better corporate investment. Foucault and Frésard (2012) empirically find that cross-listed firms have a higher investment-to-price sensitivity compared to non-cross-listed firms. The high investment-to-price sensitivity suggests that managers obtain precise information from stock prices to make better corporate investments after cross-listing. Abdallah and Abdallah (2017) find that cross-listing does not enable managers to learn from their stock prices ("listening to the market"[60]) and make better investment decisions if the managers are employed by firms from poor shareholder protection countries that are listed on the US stock market. In contrast, firms from strong investor protection countries are more likely to listen to the market.

To examine whether a Hong Kong listing influences Chinese firms' acquisition behaviour, this study firstly investigates the likelihood of Chinese firms listed in Hong Kong making acquisitions compared with their domestically listed peers in China. Secondly, the study examines whether a Hong Kong listing improves Chinese firms' ability to make successful acquisition deals. Using a matched firm sample (including Hong Kong-listed and domestically listed firms) based on the propensity score matching method, during the period between 2001 and 2015, the study finds that Hong Kong-listed Chinese firms are less likely to be acquirers compared with their domestically listed peers. Furthermore, using 2,591 acquisitions by Chinese listed firms (including Hong Kong-listed and domestically listed firms) over the period from 2001 to 2015, the study finds that Hong

[59] Kau et al. (2008) use the term "listening to the market", defined as follows: if the CAR around the M&A announcement date is greater than a certain threshold and managers complete the deal they listen to the market; alternatively if the CAR is less than a certain threshold and managers cancel the deal, they also listen to the market.

[60] Abdallah and Abdallah (2017) also use the term "listening to the market" following Kau et al. (2008)'s definition.

Kong-listed Chinese firms are more likely to make successful acquisitions compared to their domestically listed peers. Also, there is no evidence that a Hong Kong listing improves Chinese firms' ability to learn from, or listen to, the stock market in acquisition decision making. But the study does find that some deal characteristics (e.g., all-cash payments, private targets) play an important role in the decision to complete or cancel an acquisition.

This study contributes to the literature about Chinese firms' M&A. To the best of my knowledge, this is the first study that includes the three categories of Chinese firms on the SEHK (i.e., H-share, Red chip, and P chip) to examine whether Hong Kong-listed Chinese firms are more likely to attempt acquisitions and whether Hong Kong-listed Chinese firms are more likely to make successful acquisitions. The study finds that Hong Kong-listed Chinese firms are less likely to attempt acquisitions compared with their domestically listed peers. The finding is different from Ghosh and He (2015) who report that cross-listing has a significant positive influence on the number of M&As, using US data. Moreover, Hong Kong-listed Chinese firms are more likely to make successful acquisitions compared to their domestically listed peers. Also, some M&A deal characteristics (whether the target firms are private; whether the payment method is all cash, or not; and whether the deal is cross-border, or not) are found to play an important role in the decision to complete or cancel an acquisition.

This study is organized as follows. Section 4.2 reviews the related literature and develops hypotheses. Section 4.3 describes the data and research method. Section 4.4 and 4.5 report the empirical results. Section 4.6 presents the robustness test. Section 4.7 presents conclusions and limitations.

4.2. Related literature and hypotheses development

4.2.1. Cross-listing, cost of capital and corporate investment

Cross-listing plays an important role in reducing the effect of market segmentation (e.g., Miller,1999; Foerster and Karolyi, 1999). The empirical literature has reported that cross-listing improves firms in accessing to external capital with a lower cost of capital. Errunza and Miller (2000) study the relation between market segmentation and the cost of capital in international stock markets by examining a sample of 126 ADR firms across

32 countries from 1985 to 1994. They find that there is a significantly 42% decreased cost of capital for ADR firms in the US stock market. Lins et al. (2005) examine whether there is a benefit of cross-listing in terms of improving access to capital by reducing market segmentation costs. They analyze a large sample of ADR firms on US stock exchanges between 1980 and 1996 and examine the sensitivity of investment to free cash flow. They find that for ADR firms from emerging markets, the sensitivity of investment to free cash flow decreases significantly following a US listing, whereas there is no change for ADR firms from developed markets. The result shows that ADR firms from emerging markets obtain more benefits in accessing to external capital after cross-listing on US stock exchanges than ADR firms from developed markets. Also, the reduction in the cost of capital is caused by strict legal supervision for foreign firms listed in the US stock market. Hail and Leuz (2009) study whether cross-listing has an impact on the reduction in the cost of capital using an innovative approach. They estimate the cost of capital effects implied by market prices and analyst forecasts, which accounts for changes in growth expectations around cross-listings. They examine a large sample of ADR firms from 45 countries during the periods 1990 to 2005 and find that cross-listed firms on US exchanges significantly experience a large decreased cost of capital after the Sarbanes-Oxley Act. Also, they find a smaller decreased cost of capital for ADR firms in the over-the-counter market. The cost of capital reduction improves firm value for ADR firms in the US stock market.

Empirical evidence has shown that cross-listing improves corporate investment. Tolmunen and Torstila (2005) study the transatlantic evidence of 547 cross-listed European firms on US stock exchanges from 1995 to 2000 and report that these European firms have a higher likelihood of acquiring US firms after cross-listing compared to their non-cross-listed peers in their home countries. Importantly, equity is an available "acquisition currency" for cross-listed firms in M&A deals. Ghosh and He (2015) make a further investigation of cross-listing and investment decisions. They report that cross-listing has a significant positive impact on capital expenditures, M&A activities, and R&D investments. Among them, foreign cross-listed firms in the US stock market increase M&A activities compared to their non-cross-listed peers. Also, foreign cross-listed firms are associated with better M&A decisions. Foreign firms cross-listed in the US stock market are associated with better cash utilization and higher investment efficiency, particularly for those firms from counties with weak investor protection. In

summary, cross-listing contributes to better investment decisions and investment efficiency, which can improve cross-listed firms' value.

Furthermore, Mittoo (1992) argues that one main reason for listing in a foreign stock market is to raise capital. Gozzi et al. (2008) investigate the valuation evolution of international firms through cross-listing, issuing depositary receipts or raising equity capital in the international stock market, and argue that internationalization improves firm expansion. Hong Kong is an international financial centre and can provide various financing channels for Chinese firms. Importantly, Hong Kong is an open stock market for global investors compared to the mainland Chinese stock market. Hong Kong does not have foreign exchange controls and capital flows are not restricted. Therefore, Chinese firms have an advantage in raising external financing if they are listed in Hong Kong. The opportunity to access external capital through a Hong Kong listing is likely to increase the free cash flow of Chinese firms that list in Hong Kong. Jensen (1986) argues that firms with high free cash flow are more likely to make acquisitions. Hong Kong-listed Chinese firms have the opportunity to increase their free cash flow and to use this by, for example, making acquisitions. Moreover, Hong Kong-listed Chinese firms also have the opportunity to realize their acquisition strategy using equity (an acquisition currency) to reduce possible acquisition costs in future acquisitions. The first hypothesis is developed as follows:

Hypothesis 1: *Hong Kong-listed Chinese firms are more likely to be a bidder in an acquisition compared with their domestically listed peers.*

Also, Chinese firms that list in Hong Kong can improve their credibility and prestige because the Hong Kong stock market has higher accounting, legal, and governance standards than mainland China. The premium associated with higher credibility and prestige also provides a bargaining advantage during acquisitions, which increases the probability of success. The second hypothesis is developed as follows:

Hypothesis 2: *Hong Kong-listed Chinese firms are more likely to make completed acquisitions compared with their domestically listed peers.*

4.2.2. The informational feedback of stock prices and managerial learning channel

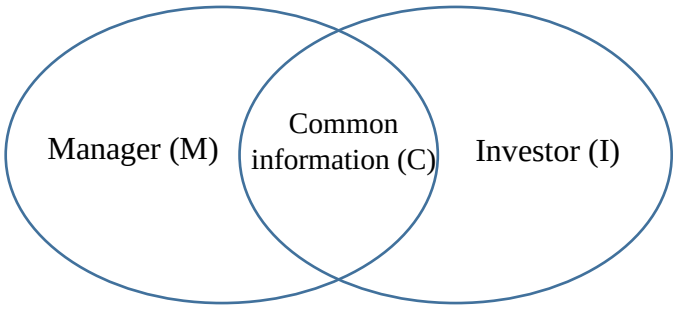
A branch of the literature suggests that stock prices can affect corporate investment. Dow and Gorton (1997) develop a model to investigate the connection between stock market efficiency and investment efficiency. The model suggests there is information asymmetry between managers of public firms and stock market traders. That is, stock market traders may have important information about investment opportunities of public firms, but managers do not have. The important information is incorporated in stock prices. Managers obtain and use informative stock prices to make corporate decisions. The stock market plays an indirect role in guiding investment by transferring two categories of information (i.e., investment opportunities and managers' former decisions). Dye and Sridhar (2002) also state that stock prices should include information not known to managers and that managers accordingly can capture relevant information to guide investment decisions. Durnev et al. (2004) find that more efficient corporate investment is associated with more informative stock prices. Bond et al. (2012) review the literature about the real effects of financial markets. They argue that prices reflect information is helpful for efficient decisions making. The informational feedback of market prices plays an important role in the effects of financial markets.

The managerial learning channel can be explained as follows: investors obtain signals about firms (e.g., their growth opportunities) and they trade based on these signals, thus information about investors is combined into stock prices. In turn, managers extract information from stock prices to make decisions. For example, managers may withdraw a larger investment plan (e.g., a major acquisition) when they receive a negative market reaction to the announcement of the investment plan. Luo (2005) investigates whether managers capture information from the stock prices to make investment decisions during the M&A announcement period. The M&A sample is 2,114 domestic deals by US public firms in the US stock market from 1990 to 1999. The finding supports the learning hypothesis as managers appear to learn from the market reaction (i.e., cumulative abnormal returns) to consummate the M&A deal later. Kau et al. (2008) also find that managers generally tend to cancel M&A deals if there is an unfavourable market reaction (i.e., cumulative abnormal returns) during the M&A announcement period using a large sample of M&A deals in the US stock market from 1990 to 2003. Chira et al (2017) find that the target type (private or public targets) plays an important role in listening to stock market signals in acquisitions. They argue that managers are less likely to listen to the

stock market reaction when the target is a private firm because managers of the bidder have more information than the stock market. Figure 4.1 presents an illustration of the set of information between managers and outside investors, which is shown by Zuo (2016). Mangers have their private information (M), and investors also have their private information (I). Common information (C) is a small set shared by managers and investors. The managerial learning channel is to explain that managers learn information (I) incorporated into stock prices.

Figure 4.1 The information sets of managers and outside investors

The figure presents the information sets of managers and outside investors by Zuo (2016). Managers' information sets contain their private information (M) and common information (C). Outside investors' information sets contain their private information (I) and common information (C).



A growing number of studies provide empirical evidence to support the managerial learning hypothesis. Chen et al. (2007) examine the relation between the amount of private information in stock price and the sensitivity of investment to stock price. They find that the amount of private information has a significant positive impact on the sensitivity of investment to stock price using US stock market data. The results suggest that managers obtain private information from stock prices and use this information to make investment decisions. Namely, there is a learning channel that links managers and stock prices. Bakke and Whited (2010) investigate whether managers make corporate investment decisions by following the informational feedback of stock prices, using a large sample from 1991 to 2004. They find weak evidence that stock market mispricing can affect investment decisions. Therefore, they confirm that managers extract private

information from stock prices to make investment decisions, which is consistent with Luo (2005) and Chen et al. (2007). Foucault and Frésard (2014) investigate whether firms' investment is influenced by their peers' market valuation (stock prices). They use a large sample of US public firms from 1996 to 2008 and these firms are industry-matched (i.e., selling similar products). Their findings indicate that managers do significantly learn from their peers' stock prices to invest. Zuo (2016) investigates whether managers extract investors' private information from stock prices to make management forecasts. The sample is a large number of earnings forecasts by 2,116 firms during the period from 1996 to 2010. He finds that managers tend to adjust their earnings forecasts when the amount of private information is higher in stock prices. Furthermore, private information in stock prices plays an important role in improving forecast accuracy. His findings are consistent with the managerial learning hypothesis.

4.2.3. Cross-listing, information environment and investment

Cross-listing has an impact on the information environment. Baker et al. (2002) examine whether cross-listing increases firm visibility using a large sample of international firms listed in New York or London. They find that international firms significantly increase visibility (i.e., a great analyst and media coverage) following listing in the two stock markets. Fernandes and Ferreira (2008) examine whether cross-listing improves the information environment using a large sample of non-US firms from 1980 to 2003 in the US stock market. They find that cross-listing has an asymmetric effect on stock price informativeness (the informational content of prices) of non-US firms from different countries. That is, price informativeness of developed market firms is improved after cross-listing, whereas price informativeness of emerging market firms is decreased after cross-listing. They also argue that market-wide information is more produced by increased analyst coverage than firm-specific information.

Cross-listing improves firms' information environment, which contributes to firm value. Lang et al. (2003) investigate the effect of cross-listing on improving the information environment and firm value using a large sample of ADR firms on US stock exchanges. They find that cross-listed firms are associated with more analyst coverage and higher forecast accuracy than non-cross-listed firms. Also, they find that the higher market valuations of cross-listed firms are associated with greater analyst coverage and higher forecast accuracy. They argue that improved information environments of cross-listed

firms have an impact on enhancing their market valuations. Bailey et al. (2006) examine market reactions around earnings announcements for non-US firms cross-lists in the US to understand the economic consequence of the increased disclosure. Their sample includes a large number of earnings announcement events for 387 non-US firms from over 40 countries during the period 1989-2001. They find that absolute abnormal returns and abnormal trading volume around earnings announcements significantly increase for non-US firms cross-list in the US. They also find that firms from developed countries and firms choosing the OTC listing, or the private placement have a significantly greater increase. They argue that these market reactions are driven by changes in the individual firm's disclosure environment.

Cross-listing improves the learning channel through that information flow from the stock market to firms. Foucault and Gehrig (2008) develop a theory about cross-listing and firm value. Their theory indicates that cross-listing improves firms to obtain more precise information about their growth opportunities from their stock prices. This information can help managers to make better investment decisions, which contributes to enhancing firm value. Subsequently, Foucault and Frésard (2012) examine the theory using a large sample of 633 foreign cross-listed firms on US exchanges from 1989 to 2006 and find that cross-listed firms have a higher investment-to-price sensitivity than non-cross-listed firms. They argue that this higher investment-to-price sensitivity is mainly driven by cross-listing which strengthens the informativeness of stock prices for managers. They empirically support the "managerial learning hypothesis" to explain how managers obtain precise information from the stock prices by cross-listing. This managerial learning hypothesis suggests that investors receive signals about listed firms (e.g., growth opportunities) and they trade based on these signals, so stock prices contain information about investor behaviour. In turn, managers also extract valuable information based on their firms' stock prices to make decisions.

Abdallah and Abdallah (2017) examine the effect of law enforcement on improving managers of cross-listed firms to obtain information from stock prices. Their sample is a panel of M&A deals by 641 cross-listed firms from 1980 to 2013 in the US stock market. They use "listening to the market" to define managers to learn from stock prices following Kau et al. (2008). The "listening to the market" is measured as if the CAR around the announcement date is more than 2.5% and the transaction is completed by

managers, or the CAR is less than -2.5% and the transaction is cancelled. They find that managers of cross-listed firms listen to the market depending on their home countries. However, managers of cross-listed firms from strong investor protection countries have a greater likelihood of listening to the market. Their findings do not support the legal bonding hypothesis that improves cross-listed firms from weak investor protection countries to listen to the market. They find that listening to the market enhances firm value, which is based on an improved information environment post-cross-listing.

In the case of China, the managerial learning channel from the stock market to corporate managers is weak. Wang et al. (2009) investigate whether the Chinese stock market significantly influences corporate investments. They find that there is no significant relationship between firm-level investment and stock market valuation. They argue that because the stock prices of Chinese listed firms convey so little information about their future operating performance, corporate investments do not significantly respond to the stock market valuation. Furthermore, Yang and Wu (2021) find that Chinese listed firms do not appear to learn from, or listen to, stock market reactions (measured by cumulative abnormal returns) in M&A decision making, which is inconsistent with Luo (2005) and Kau et al. (2008). They also find that Chinese acquirers are more influenced by public media coverage, particularly negative media reactions.

Furthermore, Yang and Lau (2006) find that Chinese firms listed in Hong Kong have a better information environment that experiences more analysts covering. Li et al. (2015) argue that investors' ability to utilize firm-specific information promotes Chinese firms to disclose more information in China's unique institution of capital markets. They examine 60 Chinese cross-listed firms (both traded as A-share in China and H-share in Hong Kong) from 2005 to 2010. They find that the same firm traded as H-share provides more firm-specific information to foreign investors than it traded as an A-share to domestic Chinese investors. Their findings suggest that investor-type could play an independent role to influence the firm's information disclosure.

Chinese firms can obtain various benefits by listing in Hong Kong as the Hong Kong stock market has higher accounting, legal, and governance standards than mainland China. Also, the Hong Kong stock market is a more mature and more transparent market, which can improve the information environment of Chinese firms and enable managers

to learn from the stock prices to M&A announcements, to make investment decisions. Therefore, a Hong Kong listing should provide a good learning channel to help managers of Chinese firms improve their investment decisions. The third hypothesis is developed as follows:

Hypothesis 3: *Managers of Hong Kong-listed Chinese firms are more likely to learn from, or listen to, the stock market when making acquisition decisions compared with their domestically listed peers.*

4.3. Data and research method

4.3.1. Firm sample

4.3.1.1 Hong Kong-listed firm

The list of Chinese firms (H-share and Red chip) is provided by the official website of the Stock Exchange of Hong Kong (SEHK). Delisted Chinese firms (H-share and Red chip) for this study were obtained from annual SEHK Fact Books. To identify P chip firms traded on the Main Board of SEHK, the study employed two key criteria: (1) Geographical distribution of corporate headquarters ─ if a firm is headquartered in mainland China, it is classified as a P chip; (2) Geographic segments of company's assets and revenues ─ if a firm's revenue (100%) is derived from mainland China or a firm's assets (100%) are located in mainland China, it is classified as a P chip. The data about corporate headquarters and geographic segments were collected from S&P Capital IQ. In addition, this study also obtained P chip information from the "Russell Global Index membership list". Similarly, data for delisted Chinese firms (P chip) are collected from annual SEHK Fact Books. The Hong Kong listing sample includes Chinese firms on the Main Board of the SEHK from 01.2001 to 12.2015 covered by DataStream. After excluding Chinese firms in the financial service sector[61], in total, there are 142 Red chips, 167 H-shares and 460 P chips.

4.3.1.2. Domestically listed firm

The domestic listed sample is selected from Chinese firms domestically traded on the Shanghai Stock Exchange (SSE) or the Shenzhen Stock Exchange (SZSE) as A-share firms from 01.2001 to 12.2015 that are covered by DataStream. Chinese firms called

[61] Real estate firms are not excluded.

"AH-share" firms are listed both in mainland China and Hong Kong and are excluded from the domestically listed sample and included in the Hong Kong-listed sample. The data of delisted Chinese firms (A-share) were checked and collected using the statistical data from the official website of the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE). After excluding Chinese firms in the financial service sector[62], the domestically listed sample includes 1,512 Chinese firms (A-share). The domestically listed Chinese firms are employed as a control sample in this study.[63] To sum up, there are 769 Hong Kong-listed firms and 1,512 domestically listed firms in the raw sample. The following table (Table 4.1) provides more details about the different categories of firms.

Table 4.1 Hong Kong-listed firms and domestically listed firms (Unmatched sample)
This table reports all Chinese listed firms in the raw sample over the period 2001-2015. The different firm types are classified by the author.

Hong Kong listing	Number of firms	Domestic listing	Number of firms
H-share	167	*Shanghai (A-share)*	1,046
Red chip	142	*Shenzhen (A-share)*	466
P chip	460		
Total	769	Total	1,512

4.3.2. M&A sample

The initial sample includes all acquisitions made by Chinese listed firms across 15 years (from 01.01.2001 to 31.12.2015). The acquisitions are reported in the database S&P Capital IQ. These Chinese bidders are domestic listed firms (A-share) on the Shanghai Stock Exchange (SSE) or the Shenzhen Stock Exchange (SZSE) and Hong Kong-listed firms (H-share, Red chip and P chip) on the Main Board of SEHK (Stock Exchange of Hong Kong). Firstly, all acquisitions made by Chinese listed firms were collected from the database S&P Capital IQ. There are 2,029 acquisitions reported on the Shanghai Stock Exchange (SSE); 2,112 acquisitions reported on the Shenzhen Stock Exchange (SZSE); There are 3,830 acquisitions reported on the Stock Exchange of Hong Kong (SEHK) from 2001 to 2015 and it needs to identify which transactions are made by

[62] Real estate firms are not excluded.
[63] Some studies employ Chinese firms (A-share) as a control sample in their studies, for example Hung et al. (2012) and Ke et al. (2012).

Chinses listed firms (i.e., H-share, Red chip, P chip). Then, these acquisitions were checked to find out whether they were made by Chinese listed firms using the following criteria: (1) A-share firms, if the bidders are listed on the Shanghai Stock Exchange (SSE) or the Shenzhen Stock Exchange (SZSE) from 01.01.2001 to 31.12.2015 and financial data is reported in DataStream; (2) Hong Kong-listed Chinese firms, if the bidders are listed firms on the Stock Exchange of Hong Kong (SEHK) from 01.01.2001 to 31.12.2015 and financial data is reported in DataStream. After checking the acquisitions made by Chinese listed firms on the Stock Exchange of Hong Kong (SEHK) by three categories (H-share, Red chip and P chip). The sample includes 3,423 acquisitions by Chinese listed firms, in which firms in the financial services sector[64] are excluded. After excluding transactions that do not have 5-day cumulative abnormal returns (CARs) during the announcement period in the DataStream or transactions that miss information about financial variables in the DataStream or hostile acquisitions, finally, there are 612 transactions by Hong Kong-listed firms and 1,979 transactions by domestically listed firms. Additionally, Table 4.2 presents the details of cross-border[65] acquisitions by Chinese firms, which shows the geographical distribution of the targets in the sample from 2001 to 2015.

[64] Real estate firms are not excluded.

[65] A cross-border deal is defined as one in which the acquirer and the target are from different countries. In the thesis, Hong Kong and Macau are considered as different countries as their economic and legal system are different from mainland China. If Hong Kong-listed Chinese firms take over Chinese firms in mainland China, these are considered to be cross-border deals. If Chinese firms in mainland China take over Hong Kong firms, these are also considered to be cross-border deals.

Table 4.2 Geographical distribution of the targets in cross-border acquisitions

This table reports the geography of the targets in the sample from 2001 to 2015. The data is collected from S&P Capital IQ. The headquarter is the main information to locate the target's country.

Panel A: Targets of Hong Kong-listed bidders

Country	Freq.
Australia	2
Belgium	1
Bermuda	1
British Virgin Islands	22
Canada	2
Cayman Islands	2
China	89
Germany	4
Indonesia	1
Italy	2
Japan	1
Kazakhstan	1
Kyrgyzstan	1
Laos	1
Macau	5
New Zealand	1
Philippines	1
Russia	1
Singapore	2
Sweden	1
Turkey	1
US	4
Vietnam	1
Total	147

Panel B: Targets of domestically listed bidders

Country	Freq.
Australia	4
Belgium	1
Bolivia	1
British Virgin Islands	2
Canada	2
Cayman Islands	2
Congo	2
France	3
Gabon	2
Germany	8
Hong Kong	15
India	2
Japan	1
Kazakhstan	3
Luxembourg	1
Malta	1
Mongolia	2
Mozambique	1
Netherlands	1
Oman	1
Poland	1
Singapore	5
South Africa	1
Taiwan	2
Thailand	2
UK	3
US	4
Vietnam	1
Total	74

4.3.3. Propensity score matched sample

To examine Hypothesis 1, this study employs a propensity score matching procedure (Rosenbaum and Rubin, 1983) to mitigate the potential issues of endogeneity and self-selection. To examine whether a Hong Kong listing has an impact on acquisitions by Chinese firms, the propensity score matching procedure identifies a matched sample of Chinese firms with similar firm characteristics to those Chinese firms with a Hong Kong

listing, to reduce the potential sample selection bias. The motivation of the propensity score matching is to find two groups of Chinese firms that have an acquisition record in a given year that have similar firm characteristics (i.e., treatment firms). Similarly, two groups of Chinese firms without an acquisition record in a given year that also have similar firm characteristics are found (i.e., control firms). In the study, the propensity score matching procedure employs the nearest neighbour matching method to find matched firms from the sample of Hong Kong-listed Chinese firms and the sample of domestically listed Chinese firms. In the logit estimation, the treatment variable is a dummy variable to identify whether a firm has an acquisition record or not in a particular year. Also, some firm characteristics (i.e., *Tobin's Q*, *Free cash flow*, *Leverage*, *Sales growth*, *Firm size*, and *Industry*) are employed as variables to identify whether a firm is likely to have an acquisition record or not. Taken together, the logit regression model can be expressed as follows:

$$\Pr(\textit{Treatment}) = \alpha + \beta_1 \textit{Tobin's Q} + \beta_2 \textit{Free cash flow} + \beta_3 \textit{Leverage} + \beta_4 \textit{Sales growth} + \beta_5 \textit{Firm size} + \beta_6 \textit{Industry} + \varepsilon \quad (1)$$

Where the variable *Treatment* is a dummy variable used to examine whether a firm makes an acquisition bid in a given year: if a firm makes an acquisition bid it is equal to one, otherwise it is equal to zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt divided by total assets. *Sales growth* is measured by net sales in year *t* minus net sales in year *t-1* scaled by net sales in year *t-1*. *Firm size* is measured as the logarithm of total assets. *Industry* is as defined and shown in Appendix 2 of the thesis.

Table 4.3 shows the details of the matched sample after propensity score matching. The Hong Kong-listed firm sample in Table 4.3 has 473 firms across three categories (i.e., H-share, Red chip, P chip) after propensity score matching, which is a reduction of 296 Hong-Kong listed Chinese firms from the unmatched firm sample reported in Table 4.1. The domestically listed firm sample has 1,050 A-share firms, which is a reduction of 462 A-share firms from the unmatched firm sample reported in Table 4.1.

Table 4.3 Matched sample by different types of Chinese listed firms
This table reports the sample after propensity score matching using the firm sample in Table 4.1. The different firm types are classified by the author.

Hong Kong listing	Number of firms	Domestic listing	Number of firms
H-share	119	*A-share*	1,050
Red chip	101		
P chip	253		
Total	473	Total	1,050

4.3.4. Variables and empirical models

4.3.4.1. The likelihood of acquisition

The methodology used to predict a bidder is similar to that employed by Harford (1999) and Tolmunen and Torstila (2005). The dependent variable *Bidder* is a dummy variable used to examine whether a firm makes an acquisition bid in a given year: if a firm makes an acquisition bid it is equal to one, otherwise it is equal to zero. The key independent variable is *Hong Kong listing,* and it is also a dummy variable. If an acquirer is a Hong Kong-listed firm, it is equal to one, otherwise it is equal to zero.

The control variables are selected from firm-level variables (*Tobin's Q*, *Free cash flow*, *Leverage*, *Sales growth*, and *Firm size*). Harford (1999) uses the Market-to-Book ratio to control the effect of firm performance while Tolmunen and Torstila (2005) use ROE (Return on Equity). In this study, *Tobin's Q* is employed as a control variable, similar to Ghosh and He (2015). Tobin's Q is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. Jensen (1986) argues that managers are more likely to make acquisitions if their firm is cash-rich. Harford (1999) finds consistent evidence showing that cash-rich firms have a higher likelihood of being a bidder compared to other firms. *Free cash flow* is employed as a control variable and computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is employed as a control variable to account for the effect of financial risk (e.g., Harford, 1999; Tolmunen and Torstila, 2005; Ghosh and He, 2015). Leverage is measured as total debt divided by total assets. *Sales growth* is employed as a

control variable in previous studies (e.g., Harford, 1999; Tolmunen and Torstila, 2005) and is also used in the study. Sales growth is measured by net sales in year *t* minus net sales in year *t-1* scaled by net sales in year *t-1*. Harford (1999) argues that firm size has a significant impact on the likelihood of acquisition and that larger firms are associated with more acquisition activities. *Firm size* is employed as a control variable, as in previous studies (e.g., Harford, 1999; Tolmunen and Torstila, 2005; Ghosh and He, 2015). In this study, it is measured as the logarithm of total assets. Taken together, the regression model can be expressed in this way:

$$\Pr(Bidder) = \alpha + \beta\, Hong\ Kong\ listing + \gamma_1\, Tobin's\ Q + \gamma_2\, Free\ cash\ flow + \gamma_3\, Leverage + \gamma_4\, Sales\ growth + \gamma_5\, Firm\ size + \varepsilon \quad (2)$$

4.3.4.2. The likelihood of completed deals for bidders

To investigate the likelihood of completed deals by Hong Kong-listed Chinese firms, this study employs a logit model by including industry fixed effects. The methodology is similar to that used in previous studies (i.e., Luo, 2005; Kau et al., 2008; Liu and McConnell, 2013; Chira et al., 2017). The dependent variable is *Complete* and is a dummy variable. If a transaction is completed, it is equal to one, otherwise it is equal to zero if a transaction is cancelled. The independent variable is *Hong Kong listing* and is also a dummy variable. If a bidder is a Hong Kong-listed firm, it is equal to one, otherwise it is equal to zero. *CAR* is also an independent variable to represent bidder cumulative abnormal returns during the M&A announcement period and is measured from day –2 to +2 relative to the bid announcement on day zero. Therefore, using data from DataStream, a 5-day CAR window is used to measure bidder returns in the study, which is similar to the method employed by Fuller et al. (2002) and Masulis et al. (2007). For Chinese firms listed on the Stock Exchange of Hong Kong (SEHK), the Price Index (PI) of the Hang Seng Index is used to compute the market return, and the market model is estimated over the period starting 210 days before, and ending 11 days prior to, the announcement. For Chinese firms listed on the Shanghai Stock Exchange (SSE), the Price Index (PI) of the SSE Composite Index is used to compute the market return and for Chinese firms listed on the Shenzhen Stock Exchange (SZSE), the Price Index (PI) of the SZSE Component Index is employed.

The control variables are selected from firm characteristics (*Tobin's Q*, *Free cash flow*, *Leverage*, *Sales growth*, *Bidder size*) and deal characteristics (*Transaction value*, *Relative deal size*, *All Cash*, *Private*, *Cross-border*, *Tender*). The firm characteristics variables are the same as those used in Equation (2). Similar to Burns et al. (2007), *Transaction value* is also employed as a control variable, and it is measured as the logarithm of total value in acquisition deals. *Relative deal size* is employed as a control variable in previous studies (e.g., Burns et al., 2007; Masulis et al., 2007; Harford et al., 2012) and is also used in this study. *Relative deal size* is computed as the transaction value divided by the sum of transaction value plus the bidder's market capitalization before the acquisition announcement. To account for the method of payment in acquisitions, *All Cash* is employed as a control variable. Following Masulis et al. (2007), *All cash* is a dummy variable, in which a deal financed all by cash is equal to one and is otherwise equal to zero. *Private* is a dummy variable. If the target is a private firm, it is equal to one, otherwise it is equal to zero. *Cross-border* is a dummy variable to identify different categories of acquisition. If an acquisition is a cross-border deal, it is equal to one, otherwise it is equal to zero. *Tender* is also a dummy to indicate whether the deal is a tender offer or not (e.g., Burns et al., 2007). If the deal is a tender offer, it is equal to one, otherwise it is equal to zero. Taken together, the regression model can be expressed as follows:

$$\Pr(Complete) = \alpha + \beta\, Hong\ Kong\ listing + \gamma_1\, CAR + \gamma_2\, Tobin's\ Q + \gamma_3\, Free\ cash\ flow + \gamma_4\, Leverage + \gamma_5\, Sales\ growth + \gamma_6\, Bidder\ size + \gamma_7\, Transaction\ value + \gamma_8\, Relative\ deal\ size + \gamma_9\, All\ cash + \gamma_{10}\, Private + \gamma_{11}\, Cross\text{-}border + \gamma_{12}\, Tender + \varepsilon \quad (3)$$

Kau et al. (2008) argue that if managers "listen" to the market, managers are more likely to complete the investment when the market responds favourably to a major corporate investment. Otherwise, managers are more likely to cancel the investment when the market views the investment negatively. The interaction term *Hong Kong listing* × *CAR* is employed to examine the effect of a Hong Kong listing on learning from, or "listening to", the stock market. Namely, if the coefficient of the interaction term *Hong Kong listing* × *CAR* is significantly positive, it suggests that a Hong Kong listing makes Chinese firms respond more to the market and so they are more (less) likely to complete the acquisition following a positive (negative) market reaction relative to Chinese firms listed in mainland China. Otherwise, If the coefficient of the interaction term *Hong Kong listing*

× *CAR* is significantly negative, it suggests that managers of Hong Kong-listed Chinese firms listen less to the market compared to the managers of domestically listed Chinese firms. To examine the combined effect of Hong Kong listings and some deal characteristics on the likelihood of completed deals, the study also includes the interaction terms *Hong Kong listing* × *All cash*, *Hong Kong listing* × *Private* and *Hong Kong listing* × *Cross-border*.

4.4. Hong Kong listing and acquisition likelihood

4.4.1. Descriptive statistics

Accounting variables and stock variables from DataStream were collected for the matched sample. M&A data are from S&P Capital IQ. The sample includes acquisitions by both Hong Kong-listed firms and domestically listed firms from 01.01.2001 to 31.12.2015. Table 4.4 presents the details of descriptive statistics of the main variables used in the study as well as the distribution of observations before winsorization. All variables are expressed in Chinese currency (Chinese Yuan Renminbi) when defined in the study. For Hong Kong-listed firms, the mean of *Bidder* is smaller than for domestically listed firms. It indicates that Hong Kong-listed firms are less likely to make acquisitions than domestically listed firms. Based on the average of *Tobin's Q*, Hong Kong-listed firms are smaller than domestically listed firms. As for *free cash flow*, the mean of all firms is negative and is the same. The mean of Hong Kong-listed firms' leverage is a little smaller than domestically listed firms' leverage. As for *Sales growth*, the average of Hong Kong-listed firms' growth is lower than that of domestically listed firms. The average size of Hong Kong-listed firms is a little greater than that of domestically listed firms. From Table 4.5 we can see that reports the results of the Pearson correlation matrix for variables in the analysis and it shows a relatively low correlation between most independent variables.

Table 4.4 Descriptive statistics

This table reports the descriptive statistics of the sample used in the analysis. The matched sample includes both Hong Kong-listed firms and domestic listed firms from 2001 to 2015. All variables are expressed in Chinese currency (Chinese Yuan Renminbi). *Bidder* is a dummy variable to identify whether a firm makes a bid. If a firm makes at least one bid in a year, it is equal to one, otherwise it is equal to zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year *t* minus net sales in year *t-1* scaled by net sales in year *t-1*. *Firm size* is measured as the logarithm of the total assets.

Panel A: Hong Kong listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
Bidder	1084	0.407	0.491	0.000	0.000	1.000
Tobin's Q	1084	1.602	1.974	0.347	1.181	55.152
Free cash flow	1084	-0.033	0.109	-1.758	-0.020	0.231
Leverage	1084	0.249	0.169	0.000	0.252	0.926
Sales growth	1084	0.405	4.520	-0.999	0.153	146.152
Firm size	1084	16.251	1.830	10.134	16.321	20.441
Panel B: Domestic listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
Bidder	2742	0.553	0.497	0.000	1.000	1.000
Tobin's Q	2742	2.479	4.745	0.656	1.693	192.705
Free cash flow	2742	-0.033	0.078	-1.043	-0.023	0.559
Leverage	2742	0.295	0.193	0.000	0.288	2.968
Sales growth	2742	0.517	6.111	-0.973	0.130	250.980
Firm size	2742	15.410	1.331	9.254	15.359	20.288

Table 4.5 Correlation coefficient matrix

This table reports the Pearson correlation matrix for variables used in the analysis. *Bidder* is a dummy variable to identify whether a firm makes a bid. If a firm makes at least one bid in a year, it is equal to one, otherwise it is equal to zero. *Hong Kong listing* is also a dummy variable. If an acquirer is listed in Hong Kong, it is a dummy variable equal to one or otherwise zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year *t* minus net sales in year *t-1* scaled by net sales in year *t-1*. *Firm size* is measured as the logarithm of the total assets.

	Bidder	*Hong Kong listing*	*Tobin's Q*	*Free cash flow*	*Leverage*	*Sales growth*	*Firm size*
Bidder	1.000						
Hong Kong listing	-0.131***	1.000					
Tobin's Q	0.108***	-0.195***	1.000				
Free cash flow	0.005	0.025	0.056***	1.000			
Leverage	0.046***	-0.113***	-0.279***	-0.313***	1.000		
Sales growth	0.043***	-0.011	0.063***	0.148***	-0.016	1.000	
Firm size	0.001	0.252***	-0.421***	0.040**	0.285***	-0.000	1.000

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.4.2. Empirical results and analysis

Table 4.6 reports the main results of Equation (2) using the logit model that includes industry fixed effects and presents the relation between Hong Kong listing and the likelihood of being a bidder (Hypothesis 1). The sample is a matched sample using the propensity score matching method to mitigate the potential issues of endogeneity and self-selection. The standard errors are adjusted for clustering at the year level to account for heteroscedasticity using the approach of Petersen (2009). In Column (1), the coefficient of *Hong Kong listing* is negative and significant at the 0.01 level. This suggests that Hong Kong-listed Chinese firms are less likely to make acquisitions compared with their domestically listed peers. Although Hong Kong-listed Chinese firms have the opportunity to access external capital and use equity as an acquisition currency, they do not appear to make more acquisitions than their domestically listed peers. As high agency costs could lead to overinvestment (e.g., Jensen, 1986; Harford, 1999) this could explain the finding that Hong Kong-listed Chinese firms are not associated with overinvestment compared with their domestically listed peers. The result is different from that reported by Ghosh and He (2015), who find that cross-listed firms are more likely to make corporate investments (including acquisitions) compared to their domestically listed peers. As for the control variables of Column (1), the coefficient of *Tobin's Q* is positive and significant at the 0.01 level, which suggests that firms with higher investment opportunities are more likely to make acquisitions. This is consistent with the finding of Edmans et al. (2012) that there is a strong relation between stock prices and upcoming acquisitions. The coefficient of *Leverage* is also positive and significant at the 0.05 level, which suggests that higher leverage induces acquisitions.

Three control variables (i.e., *Free cash flow*, *Sales growth,* and *Firm size*) do not have significant coefficients. To consider the influence of three categories of Chinese firms listed in Hong Kong on acquisition decisions, Table 4.6 provides the findings for the sub-samples. Column (2) reports the results of non-P chips (H-shares and Red chips) compared with A-shares. Column (3) reports the results of P chips compared with A-shares. The coefficient of *Hong Kong listing* is negative and significant at the 0.01 level in Column (2) but only significant at the 0.10 level in Column (3). This suggests that Hong Kong-listed Chinese firms are less likely to make acquisitions compared with their domestically listed peers, which is mostly driven by non-P chip firms. The sign of the coefficient of *Tobin's Q* remains the same as in Column (1). The coefficients of *Leverage*

report similar results as in Column (1).

Table 4.6 Hong Kong listing and the likelihood of being a bidder (Matched sample)

This table reports the estimation of Equation (2) for a matched sample. The logit model includes industry fixed effects. The dependent variable *Bidder* is a dummy variable to identify whether a firm makes a bid. If a firm makes at least one bid in a year, it is equal to one, otherwise it is equal to zero. The variable *Hong Kong listing* and is also a dummy variable: if an acquirer is listed in Hong Kong, it is equal to one or otherwise zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year t minus net sales in year t-1 scaled by net sales in year t-1. *Firm size* is measured as the logarithm of the total assets. All continuous variables are winsorized at the 1% and 99% levels. The robust z-statistics in parentheses are clustered by the firm to adjust for heteroscedasticity. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Matched sample	Non-P chips vs. A-shares	P chips vs. A-shares
	(1) Logit	(2) Logit	(3) Logit
Hong Kong listing	-0.564***	-0.763***	-0.396*
	(-3.73)	(-4.71)	(-1.95)
Tobin's Q	0.173***	0.187***	0.189***
	(3.42)	(3.33)	(3.27)
Free cash flow	-0.453	-0.259	-0.881
	(-0.88)	(-0.45)	(-1.47)
Leverage	0.493**	0.412*	0.469**
	(2.07)	(1.93)	(1.98)
Sales growth	0.074	0.073	0.047
	(1.46)	(1.36)	(0.74)
Firm size	0.073	0.116	0.160*
	(1.04)	(1.45)	(1.77)
Constant	-1.665	-2.263	-3.116**
	(-1.29)	(-1.53)	(-1.97)
Observations	3,826	3,335	3,233
Pseudo R^2	0.041	0.040	0.038
Industry FE	YES	YES	YES

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.5. Hong Kong listing and transaction completion likelihood

4.5.1. Descriptive statistics

Accounting variables and stock variables for the M&A sample were collected from DataStream. M&A data were collected from S&P Capital IQ. The M&A sample includes acquisitions (i.e., completed deals and cancelled deals) by both Hong Kong-listed firms and domestically listed firms from 01.01.2001 to 31.12.2015. In total, there are 612 transactions by Hong Kong-listed firms and 1,979 transactions by domestically listed firms. Table 4.7 presents the details of descriptive statistics of the main variables used in the study as well as the distribution of observations before winsorization. The mean of *Complete* for Hong Kong-listed bidders is larger than for domestically listed bidders. Hong Kong-listed bidders are associated with a higher completed proportion. For the variable *CAR*, Hong Kong-listed bidders are associated with lower CARs than domestically listed bidders. The average of *Tobin's Q* for Hong Kong-listed bidders is smaller than for domestically listed bidders. For all bidders, the mean of *Free cash flow* is negative, but Hong Kong-listed bidders have a little smaller mean than for domestically listed bidders. Hong Kong-listed bidders' leverage is smaller than domestically listed bidders. Hong Kong-listed bidders are associated with a higher average of sales growth than domestically listed bidders. The average bidder size of Hong Kong-listed firms is a little larger than domestically listed bidders. The average transaction value for Hong Kong-listed bidders is similar to domestically listed bidders. As for the mean of *Relative deal size*, Hong Kong-listed bidders are also similar to domestically listed bidders. For the variable *All cash*, the mean of Hong Kong-listed bidders is similar to domestically listed bidders. For the variable *Private*, the mean of Hong Kong-listed bidders is also similar to domestically listed bidders. Hong Kong-listed bidders are more likely to make cross-border deals. Hong Kong-listed bidders are also more likely to make a tender offer. Table 4.8 reports the mean difference between domestically listed firms and Hong Kong-listed firms for the variables. It is evident that for some variables (i.e., *Complete*, *Tobin's Q*, *Free cash flow*, *Leverage*, *Bidder size*, *Private*, *Cross-border*, *Tender*) there are clear differences between the mean values of domestically listed firms and Hong Kong-listed firms. Table 4.9 reports the results of the Pearson correlation matrix for the variables used in the analysis and shows a relatively low correlation between most independent variables.

Table 4.7 Descriptive statistics

This table reports the descriptive statistics of the sample used in the analysis. The sample includes transactions by Chinese listed firms (Hong Kong-listed and domestically listed) from 2001 to 2015. All variables are expressed in Chinese currency (Chinese Yuan Renminbi). *Complete* is a dummy variable. If a transaction is completed it is equal to one, and otherwise it is equal to zero if a transaction is cancelled. *CAR* is the 5-day cumulative abnormal return during the M&A announcement event days (−2,+2). *Tobin's Q* represents the firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year t minus net sales in year t-1 scaled by net sales in year t-1. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization before the acquisition announcement. *All cash* is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. *Private* is a dummy variable. If the target is a private firm, it is equal to one, otherwise it is equal to zero. *Cross-border* is a dummy variable to identify the cross-border acquisition and it is equal to one if the acquisition is cross-border, otherwise it is equal to zero. *Tender* is equal to one if the transaction is a tender offer, otherwise it is equal to zero.

Panel A: Hong Kong listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
Complete	612	0.887	0.317	0.000	1.000	1.000
CAR	612	0.013	0.098	-0.511	0.007	0.838
Tobin's Q	612	1.594	1.286	0.395	1.129	10.580
Free cash flow	604	-0.035	0.107	-1.758	-0.014	0.148
Leverage	612	0.286	0.150	0.000	0.301	0.717
Sales growth	612	0.818	8.412	-0.999	0.195	146.152
Bidder size	612	16.829	1.852	10.650	17.207	20.441
Transaction value	612	6.874	0.949	1.099	7.167	7.879
Relative deal size	612	0.510	0.246	0.009	0.496	0.999
All cash	612	0.881	0.324	0.000	1.000	1.000
Private	612	0.979	0.144	0.000	1.000	1.000
Cross-border	612	0.230	0.421	0.000	0.000	1.000
Tender	612	0.007	0.081	0.000	0.000	1.000
Panel B: Domestic listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
Complete	1979	0.587	0.493	0.000	1.000	1.000
CAR	1979	0.025	0.302	-0.363	0.003	7.457
Tobin's Q	1979	2.314	2.414	0.755	1.587	34.282
Free cash flow	1891	-0.028	0.070	-0.505	-0.014	0.387
Leverage	1979	0.311	0.185	0.000	0.317	2.968
Sales growth	1979	0.471	5.760	-0.957	0.143	250.980
Bidder size	1979	15.838	1.444	11.434	15.716	20.036
Transaction value	1979	6.831	1.037	1.386	7.161	7.879
Relative deal size	1979	0.517	0.266	0.003	0.501	0.999
All cash	1979	0.884	0.321	0.000	1.000	1.000
Private	1979	0.990	0.100	0.000	1.000	1.000
Cross-border	1979	0.040	0.197	0.000	0.000	1.000
Tender	1979	0.001	0.022	0.000	0.000	1.000

Table 4.8 Mean difference between domestically listed firms and Hong Kong-listed firms
This table reports the descriptive statistics of the sample used in the analysis. The sample includes transactions by Chinese listed firms (Hong Kong-listed and domestically listed) from 2001 to 2015. All variables are expressed in Chinese currency (Chinese Yuan Renminbi). *Complete* is a dummy variable. If a transaction is completed it is equal to one, and otherwise it is equal to zero if a transaction is cancelled. *CAR* is the 5-day cumulative abnormal return during the M&A announcement event days (−2,+2). *Tobin's Q* represents the firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year t minus net sales in year t-1 scaled by net sales in year t-1. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization before the acquisition announcement. *All cash* is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. *Private* is a dummy variable. If the target is a private firm, it is equal to one, otherwise it is equal to zero. *Cross-border* is a dummy variable to identify the cross-border acquisition and it is equal to one if the acquisition is cross-border, otherwise it is equal to zero. *Tender* is equal to one if the transaction is a tender offer, otherwise it is equal to zero.

Variables	Domestic listing		Hong Kong listing		t-test for difference in mean
	Observations	Mean	Observations	Mean	
Complete	1979	0.587	612	0.887	-0.300***
CAR	1979	0.025	612	0.013	0.012
Tobin's Q	1979	2.314	612	1.594	0.737***
Free cash flow	1891	-0.028	604	-0.035	0.007**
Leverage	1979	0.311	612	0.286	0.024***
Sales growth	1979	0.471	612	0.818	-0.345
Bidder size	1979	15.838	612	16.829	-0.992***
Transaction value	1979	6.831	612	6.874	-0.046
Relative deal size	1979	0.517	612	0.510	0.007
All cash	1979	0.884	612	0.881	0.003
Private	1979	0.990	612	0.979	0.011**
Cross-border	1979	0.040	612	0.230	-0.192***
Tender	1979	0.001	612	0.007	-0.006***

Table 4.9 Correlation coefficient matrix

This table reports the Pearson correlation coefficient for variables used in the analysis. *Complete* is a dummy variable. If a transaction is completed it is equal to one, and otherwise it is equal to zero if a transaction is cancelled. *Hong Kong listing* is also a dummy variable. If an acquirer is listed in Hong Kong, it is equal to one or otherwise zero. *CAR* is the 5-day cumulative abnormal return during the M&A announcement event days (−2,+2). *Tobin's Q* represents the firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year t minus net sales in year t-1 scaled by net sales in year t-1. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization before the acquisition announcement. *All cash* is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. *Private* is a dummy variable. If the target is a private firm, it is equal to one, otherwise it is equal to zero. *Cross-border* is a dummy variable to identify the cross-border acquisition and it is equal to one if the acquisition is cross-border, otherwise it is equal to zero. *Tender* is equal to one if the transaction is a tender offer, otherwise it is equal to zero.

	Complete	*CAR*	*Hong Kong listing*	*Tobin's Q*	*Free cash flow*	*Leverage*	*Sales growth*	*Bidder size*	*Transaction value*	*Relative deal size*	*All cash*	*Private*	*Cross-border*	*Tender*
Complete	1.000													
CAR	0.269***	1.000												
Hong Kong listing	0.073***	-0.013	1.000											
Tobin's Q	-0.090***	-0.163***	0.066***	1.000										
Free cash flow	0.057***	-0.011	-0.049**	-0.003	1.000									
Leverage	0.002	-0.058***	-0.047**	-0.345***	-0.232***	1.000								
Sales growth	0.020	-0.001	0.002	0.067***	0.094***	-0.017	1.000							
Bidder size	0.180***	0.268***	-0.057***	-0.471***	0.148***	0.358***	-0.007	1.000						
Transaction value	0.038*	0.017	0.017	-0.068***	0.057***	0.045**	-0.042**	0.075***	1.000					
Relative deal size	0.057***	-0.012	-0.003	-0.025	0.061***	0.021	-0.002	0.080***	0.255***	1.000				
All cash	-0.070***	-0.004	-0.130***	-0.119***	0.057***	0.107***	-0.043**	0.238***	-0.078***	-0.041**	1.000			
Private	-0.024	-0.042**	-0.007	0.039**	0.014	-0.039**	-0.010	-0.049**	-0.035*	-0.013	-0.031	1.000		
Cross-border	0.043**	0.289***	-0.010	-0.034*	-0.073***	-0.047**	0.020	-0.061***	0.031	0.057***	-0.134***	-0.187***	1.000	
Tender	0.013	0.058***	-0.005	-0.023	0.010	0.029	0.066***	0.021	0.011	-0.001	0.016	-0.387***	-0.013	1.000

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.5.2. Empirical results and analysis

Table 4.10 reports the main results of Equation (3) using the logit model that includes industry fixed effects and presents the relation between Hong Kong listing and transaction completion likelihood (Hypothesis 2). The standard errors of all models are adjusted for clustering at the year level to account for heteroscedasticity using the approach of Petersen (2009). Column (1) presents the results of the full sample. The key coefficient of *Hong Kong listing* is positive and significant at the 0.01 level. This indicates that Hong Kong-listed Chinese firms are more likely to make completed acquisitions compared with their domestically listed peers. Combined with the previous finding in section 4.4.2 that Hong Kong-listed Chinese firms are less likely to make acquisitions (i.e., avoiding overinvestment) this suggests that a Hong Kong listing induces managers that undertake acquisitions to complete them successfully, and therefore to make effective investment decisions. That is, they avoid acquisitions with a low probability of success. Therefore, these findings imply that managers of Chinese firms avoid wasting resources after a Hong Kong listing and therefore agency costs could be reduced, consistent with agency theory (Jensen and Meckling, 1976; Jensen, 1986). Also, Chinese firms can improve their credibility and prestige after a Hong Kong listing as the Hong Kong stock market has higher accounting, legal, and governance standards. The higher credibility and prestige increase the bargaining advantage during acquisitions for Hong Kong-listed Chinese firms. This could be an explanation for a Hong Kong listing influencing Chinese firms' acquisition behaviour (i.e., making more successful deals). The coefficient of the *CAR* is positive and significant at the 0.01 level. This indicates that there is a positive relationship between the bidder's announcement CAR and the transaction completion likelihood.

As for the control variables in Column (1), the coefficient of *Bidder size* is positive and significant at the 0.01 level, which suggests that larger bidders are more likely to complete transactions. The coefficient of *All cash* is negative and significant at the 0.01 level, which suggests that transactions with all-cash payments are less likely to be completed. The coefficient of *Private* is negative and significant at the 0.05 level, which indicates that transactions with private targets are difficult to complete. The coefficient of *Cross-border* is negative and significant at 0.01 level, indicating that cross-border transactions are more difficult to complete. To examine the different effects of a Hong Kong listing on three categories of Chinese firms, Table 4.10 provides the findings for

the sub-samples in Columns (2) and (3). The key coefficients of *Hong Kong listing* are also positive and significant at the 0.01 level. The variable *Tender* is automatically missed in Column (2) when using the logit regression estimation to avoid collinearity.

Table 4.10 Hong Kong listing and transaction completion likelihood

This table reports the estimation of Equation (3) using the logit model that includes industry fixed effects. The dependent variable is *Complete* and is a dummy variable. If a transaction is completed it is equal to one, and otherwise it is equal to zero if a transaction is cancelled. The independent variable is *Hong Kong listing* and is also a dummy variable. If an acquirer is listed in Hong Kong, it is a dummy variable equal to one or otherwise zero. *CAR* is the 5-day cumulative abnormal return during the M&A announcement event days (−2, +2). *Tobin's Q* represents the firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year t minus net sales in year t-1 scaled by net sales in year t-1. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization before the acquisition announcement. *All cash* is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. *Private* is a dummy variable. If the target is a private firm, it is equal to one, otherwise it is equal to zero. *Cross-border* is a dummy variable to identify the cross-border acquisition and it is equal to one if the acquisition is cross-border, otherwise it is equal to zero. *Tender* is equal to one if the transaction is a tender offer, otherwise it is equal to zero. The period of the sample is from 2001 to 2015. All continuous variables are winsorized at levels 1% and 99%. The robust z-statistics in parentheses are clustered by the year to adjust for heteroscedasticity. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Full sample	Non-P chips vs. A-shares	P chips vs. A-shares
	(1)	(2)	(3)
	Logit	Logit	Logit
Hong Kong listing	1.615***	1.701***	1.468***
	(11.43)	(7.70)	(9.73)
CAR	2.091***	2.159***	2.089***
	(3.57)	(3.65)	(3.44)
Tobin's Q	0.008	-0.006	0.020
	(0.22)	(-0.17)	(0.57)
Free cash flow	0.900	0.560	0.838
	(1.20)	(0.69)	(1.17)
Leverage	-0.343	-0.339	-0.406
	(-1.28)	(-1.37)	(-1.35)
Sales growth	0.043	0.013	0.033
	(0.72)	(0.23)	(0.56)
Bidder size	0.147***	0.107**	0.172***
	(3.11)	(2.24)	(3.78)
Transaction value	-0.025	-0.049	-0.022
	(-0.52)	(-1.04)	(-0.43)
Relative deal size	0.270	0.267	0.313*
	(1.56)	(1.44)	(1.80)
All cash	-0.691***	-0.802***	-0.707***
	(-3.35)	(-3.86)	(-3.10)
Private	-0.778**	-0.818*	-0.851**
	(-2.09)	(-1.85)	(-2.31)
Cross-border	-0.389***	-0.095	-0.208
	(-3.20)	(-0.61)	(-1.51)
Tender	-1.019		-1.114
	(-1.29)		(-1.42)
Constant	-0.609	0.374	-0.902
	(-0.75)	(0.39)	(-1.20)
Observations	2,492	2,184	2,195
Pseudo R^2	0.099	0.076	0.075
Industry FE	YES	YES	YES

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.11 reports the main results of Equation (3) using the logit model that includes industry fixed effects and also includes some interaction terms. The standard errors of all models are adjusted for clustering at the year level to account for heteroscedasticity using the approach of Petersen (2009). Column (1) presents the baseline model using Equation (3). In Column (2), The interaction term *Hong Kong listing* × *CAR* does not report a significant result. This indicates that there is no evidence that a Hong Kong listing enables Chinese firms to learn from, or listen to, the market in acquisition transactions. This is consistent with the finding of Yang and Wu (2021) that Chinese firms do not appear to be influenced by stock market reactions in M&A deals. The lack of significance of the interaction term coefficient *Hong Kong listing* × *CAR* also suggests that Chinese firms do not change their behaviour even though they list in a stock market with higher information flows (Hong Kong).

In Column (3), the coefficient of the interaction term *Hong Kong listing* × *All cash* is positive and significant at the 0.01 level, which shows a positive marginal effect of a Hong Kong listing on completing transactions. This indicates that Hong Kong-listed Chinese firms are more likely to complete a transaction when they choose all cash as the payment method. In Column (4), the coefficient of the interaction term *Hong Kong listing* × *Private* is positive and significant at the 0.01 level, which shows a positive marginal effect of a Hong Kong listing on completing transactions when the target is a private firm. Chira et al. (2017) argue that the bidder may be more informed than the market when the target is a private firm, which may explain why the managers of Hong Kong-listed Chinese firms do not appear to learn from, or listen to, the stock market. In Column (5), the coefficient of the interaction term *Hong Kong listing* × *Cross-border* is negative and significant at the 0.01 level, which shows a negative marginal effect of a Hong Kong listing on completing cross-border acquisitions. Overall, the study does not find evidence that a Hong Kong listing improves Chinese firms' ability to learn from, or listen to, the market when they make decisions to complete or cancel an acquisition. Additionally, the study finds that deal characteristics play an important role in the decision to complete or cancel an acquisition.

Table 4.11 Hong Kong listing and transaction completion likelihood (including interaction terms)
This table reports the estimation of Equation (3) using the logit model that includes industry fixed effects. The dependent variable is *Complete* and is a dummy variable. If a transaction is completed it is equal to one, and otherwise it is equal to zero if a transaction is cancelled. The independent variable is *Hong Kong listing* and is also a dummy variable. If an acquirer is listed in Hong Kong, it is a dummy variable equal to one or otherwise zero. The same control variables from Equation (3), namely *CAR*, *Tobin's Q*, *Cash ratio*, *Leverage*, *Sales growth*, *Bidder size*, *Transaction value*, *Relative deal size*, *All cash*, *Private*, *Cross-border*, *Tender*. The period of the sample is from 2001 to 2015. All continuous variables are winsorized at levels 1% and 99%. The robust z-statistics in parentheses are clustered by the year to adjust for heteroscedasticity. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Full sample	Full sample	Full sample	Full sample	Full sample
	(1)	(2)	(3)	(4)	(5)
	Logit	Logit	Logit	Logit	Logit
Hong Kong listing	1.615***	1.620***	0.732**	-0.336	1.933***
	(11.43)	(11.52)	(2.02)	(-0.74)	(10.39)
CAR	2.091***	2.236***	2.058***	2.100***	2.068***
	(3.57)	(3.62)	(3.62)	(3.60)	(3.66)
Hong Kong listing × CAR		-1.208			
		(-0.92)			
Tobin's Q	0.008	0.007	0.002	0.007	0.002
	(0.22)	(0.22)	(0.06)	(0.21)	(0.06)
Free cash flow	0.900	0.916	0.772	0.880	0.845
	(1.20)	(1.20)	(1.03)	(1.18)	(1.11)
Leverage	-0.343	-0.343	-0.346	-0.354	-0.331
	(-1.28)	(-1.28)	(-1.27)	(-1.33)	(-1.22)
Sales growth	0.043	0.043	0.045	0.038	0.046
	(0.72)	(0.71)	(0.75)	(0.65)	(0.76)
Bidder size	0.147***	0.149***	0.141***	0.147***	0.130***
	(3.11)	(3.15)	(2.88)	(3.13)	(2.75)
Transaction value	-0.025	-0.026	-0.026	-0.024	-0.029
	(-0.52)	(-0.54)	(-0.54)	(-0.50)	(-0.59)
Relative deal size	0.270	0.267	0.269	0.258	0.258
	(1.56)	(1.54)	(1.55)	(1.51)	(1.45)
All cash	-0.691***	-0.689***	-0.825***	-0.693***	-0.748***
	(-3.35)	(-3.33)	(-3.55)	(-3.36)	(-3.66)
Hong Kong listing × All cash			0.979***		
			(3.17)		
Private	-0.778**	-0.780**	-0.718*	-1.256***	-0.541
	(-2.09)	(-2.11)	(-1.91)	(-3.54)	(-1.57)
Hong Kong listing × Private				1.988***	
				(5.33)	
Cross-border	-0.389***	-0.390***	-0.281**	-0.399***	0.266*
	(-3.20)	(-3.25)	(-2.01)	(-3.37)	(1.88)
Hong Kong listing × Cross-border					-1.477***
					(-5.70)
Tender	-1.019	-1.015	-1.005	-0.040	-0.964
	(-1.29)	(-1.28)	(-1.30)	(-0.04)	(-1.19)
Constant	-0.609	-0.619	-0.441	-0.124	-0.509
	(-0.75)	(-0.76)	(-0.52)	(-0.15)	(-0.63)
Observations	2,492	2,492	2,492	2,492	2,492
Pseudo R^2	0.099	0.099	0.101	0.100	0.104
Industry FE	YES	YES	YES	YES	YES

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.6. Robustness checks

4.6.1. Hong Kong listing and acquisition likelihood (Unmatched sample)

Table 4.12 reports the main results of Equation (2) for the unmatched sample to examine Hypothesis 1. The sample is an unmatched sample before the propensity score matching method is applied. The model includes industry fixed effects, and the standard errors are adjusted for clustering at the year level to account for heteroscedasticity, using the approach of Petersen (2009). In Column (1), the coefficient of *Hong Kong listing* is negative and significant at the 0.01 level, which presents a similar result to that shown in Table 4.6. As for the control variables in Column (1), the coefficient of *Tobin's Q* is positive and significant at the 0.01 level, which is a similar result to that reported in Table 4.6. The coefficient of *Leverage* is positive and significant at the 0.05 level, which is also a similar result to that reported in Table 4.6. Unlike Table 4.6, the other control variables (i.e., *Free cash flow*, *Sales growth*, *Firm size*) all have significant coefficients. *Free cash flow* is positive and significant at the 0.05 level, which is consistent with Harford's (1999) finding that cash-rich firms are more likely to make acquisitions. The coefficient of *Sales growth* is positive and significant at the 0.01 level, which is also consistent with Harford's (1999) finding that firms with higher growth opportunities are more likely to make acquisitions. The coefficient of *Firm size* is positive and significant at the 0.01 level, which suggests that larger firms are associated with more acquisition activities.

To examine any differences between the three categories of Chinese firms listed in Hong Kong, Table 4.12 provides the findings for the sub-samples. The results still remain similar when the unmatched sample is split based on non-P Chips (column 2) and P chips (column 3), and these results are consistent with the results reported in Table 4.6. The coefficient of *Hong Kong listing* is negative and significant at the 0.01 level for all models, which suggests that Hong Kong-listed Chinese firms are less likely to make acquisitions compared with their domestically listed peers.

Table 4.12 Hong Kong listing and the likelihood of being a bidder (Unmatched sample)
This table reports the estimation of Equation (2) for the unmatched sample. The logit model includes industry fixed effects. *Bidder* is a dummy variable to identify whether a firm makes a bid. If a firm makes at least one bid in a year, it is equal to one, otherwise it is equal to zero. The independent variable *Hong Kong listing* and is also a dummy variable. If an acquirer is listed in Hong Kong, it is equal to one or otherwise zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year t minus net sales in year t-1 scaled by net sales in year t-1. *Firm size* is measured as the logarithm of the total assets. All variables are winsorized at levels 1% and 99%. The robust z-statistics in parentheses are clustered by the year to adjust for heteroscedasticity. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Unmatched sample	Non-P chips vs. A-shares	P chips vs. A-shares
	(1) Logit	(2) Logit	(3) Logit
Hong Kong listing	-0.683***	-0.951***	-0.492***
	(-4.67)	(-6.28)	(-2.85)
Tobin's Q	0.162***	0.181***	0.170***
	(3.99)	(4.09)	(3.90)
Free cash flow	0.899**	1.091***	0.537
	(2.37)	(2.71)	(1.31)
Leverage	0.283**	0.257**	0.248*
	(2.15)	(2.19)	(1.86)
Sales growth	0.068***	0.074**	0.067*
	(2.59)	(2.54)	(1.96)
Firm size	0.486***	0.534***	0.555***
	(7.95)	(7.61)	(7.80)
Constant	-10.081***	-10.814***	-11.265***
	(-8.91)	(-8.37)	(-8.83)
Observations	21,683	18,620	18,483
Pseudo R^2	0.073	0.074	0.081
Industry FE	YES	YES	YES

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.6.2. Self-selection bias

The non-random sample selection (i.e., self-selection bias) is a specific type of endogeneity (i.e., omitted-variables bias). Self-selection bias may arise when the treatment group and control group are not randomly from the same population. In this study, the treatment group includes Hong Kong-listed firms and the control group includes domestically listed firms. Because the Hong Kong-listed sample is not randomly selected from the same population (Chinese firms listed in Hong Kong or mainland China), a potential selection bias must be considered seriously. That is, Chinese firms choosing to list in Hong Kong may be self-selected and this could lead to biased results when using a dummy variable (i.e., Hong Kong listing) to investigate the effect of a Hong Kong listing. To correct for potential self-selection bias, a Heckman (1979) two-step estimation method is employed, which is similar to Doidge et al. (2004), Tolmunen and Torstila (2005) and Foucault and Frésard (2012). The first step is to estimate the mechanism of a Hong Kong listing using a probit model with some firm-level variables. That is, the probit model is to examine whether a Chinese firm chooses to list in Hong Kong or not. To construct the probit model, some firm-level variables that may affect a Hong Kong listing are chosen, including *ROA*, *P/E ratio*, *Sales growth*, *Cash flow*, *Leverage* and *Bidder size*. The first equation of the Heckman (1979) two-step estimation method is a probit model with industry fixed effects that estimates the likelihood of a Hong Kong listing and produces the inverse Mills ratio (Lambda). The first stage is the estimation of the following model:

$$\Pr(\textit{Hong Kong listing}) = \alpha + \beta_1 \textit{ROA} + \beta_2 \textit{P/E ratio} + \beta_3 \textit{Sales growth} + \beta_4 \textit{Cash flow} + \beta_5 \textit{Leverage} + \beta_6 \textit{Bidder size} + \varepsilon \quad (4)$$

Where *Hong Kong listing* is the dependent variable and is also a dummy variable to identify whether a firm has a Hong Kong listing or not. For a firm is a Hong Kong-listed firm, the value is equal to one, otherwise it is equal to zero. Pagano et al. (2002) argue that the motivation for a foreign listing is to obtain foreign capital from the international capital markets to meet firms' growing demands. Therefore, *ROA* and *Sales growth* are two variables that measure a firm's growing demand chosen in the model. *ROA* is defined as the sum of earnings before interest, taxes, depreciation, and amortization over total assets. *P/E ratio* represents a firm's growth opportunity and is computed as the stock price scaled by earnings per share yearly. *Sales growth* is measured by net sales in year *t*

minus net sales in year *t-1* scaled by net sales in year *t-1*. *Cash flow* is measured by cash flows from operations divided by total assets. *Leverage* is measured as total debt divided by total assets. The firm size is also an important factor for a Hong Kong listing as Pagano et al. (2002) find that large firms are more likely to list overseas. *Bidder size* is employed in the model and measured as the logarithm of total assets.

The second stage of the Heckman (1979) two-step estimation method is a logit estimation with industry fixed effects to examine the relation between Hong Kong listings and transaction completion likelihood after adding the inverse Mills ratio (Lambda) to the equation. The inverse Mills ratio (Lambda) is generated from the probit model estimation in the first stage and as an additional control variable in the second stage estimation. If the coefficient of the inverse Mills ratio (Lambda) is significant, and the coefficient of the key variable is similar to the model that is examined, the Heckman correction shows that there is self-selection bias in the treated group (Hong Kong-listed sample). If the inverse Mills ratio (Lambda) is not significant, and the coefficient of the key variable is similar to the model that is examined, in this case, the sample selection of the treated group is assumed to be a random selection from the population. The second stage of the Heckman (1979) two-step estimation method is the following model:

$$\Pr(\textit{Complete}) = \alpha + \beta\, \textit{Hong Kong listing} + \gamma_1\, \textit{CAR} + \gamma_2\, \textit{Tobin's Q} + \gamma_3\, \textit{Free cash flow} + \gamma_4\, \textit{Leverage} + \gamma_5\, \textit{Sales growth} + \gamma_6\, \textit{Bidder size} + \gamma_7\, \textit{Transaction value} + \gamma_8\, \textit{Relative deal size} + \gamma_9\, \textit{All cash} + \gamma_{10}\, \textit{Private} + \gamma_{11}\, \textit{Cross-border} + \gamma_{12}\, \textit{Tender} + \gamma_{13}\, \textit{Inverse Mills Ratio (Lambda)} + \varepsilon \quad (5)$$

Where the dependent variable, independent variables and control variables are the same as Equation (3). The difference between Equation (3) and Equation (5) is that there is a new control variable Inverse Mills Ratio (Lambda) added in Equation (5). The Inverse Mills Ratio (Lambda) is computed from the first stage and participates in the second stage estimation.

Table 4.13 Heckman two-stage estimation

This table displays the results of Equation (3) using the Heckman two-stage estimation. Column (1) presents the results of the first stage (probit estimation with industry fixed effects), where *Hong Kong listing* is the dependent variable, measured as a dummy variable to identify whether a Chinese firm lists in Hong Kong or not. The probit estimation includes firm-level independent variables (*i.e., ROA, P/E ratio, Sales growth, Cash flow, Leverage, Bidder size*). Column (2) reports the results of the second stage (Logit estimates with industry fixed effects) where *Complete* is the dependent variable and *Hong Kong listing* is the independent variable. *Complete* is a dummy variable. If a transaction is completed it is equal to one, and otherwise it is equal to zero if a transaction is cancelled. The second stage estimation uses the same control variables from Equation (3), namely *CAR, Tobin's Q, Cash ratio, Leverage, Sales growth, Bidder size, Transaction value, Relative deal size, All cash, Private, Cross-border, Tender*. The *Inverse Mills Ratio (i.e., Lambda)* is computed from the first stage and participates in the second stage estimation as an additional control variable. The period of the sample is from 2001 to 2015. The standard z-statistics are reported in parentheses. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Heckman	
	(First-Stage) Probit	Second Stage
Hong Kong listing		0.574**
		(2.34)
CAR		0.014
		(0.09)
Tobin's Q		-0.009
		(-0.73)
Cash ratio		0.517*
		(1.91)
Leverage		0.168
		(1.35)
Sales growth		0.038
		(1.54)
Bidder size		0.003
		(0.26)
Transaction value		0.016
		(1.10)
Relative deal size		-0.060
		(-1.13)
All cash		0.016
		(0.31)
Private		0.102
		(0.98)
Cross-border		-0.107***
		(-3.10)
Tender		-0.185
		(-0.94)
ROA	0.450	
	(0.69)	
P/E ratio	-0.007***	
	(-10.58)	
Sales growth	-0.051	
	(-1.02)	
Cash flow	-0.389	
	(-0.87)	
Leverage	-1.694***	
	(-7.23)	
Bidder size	0.028***	
	(3.08)	
Inverse Mills Ratio		0.015
		(0.38)
Observations	2,313	2,313
Industry FE	YES	YES

z-statistics in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 4.13 reports the results of the Heckman correction. Column (1) presents the results of the first stage (probit estimation) to examine why Chinese firms choose to list in Hong Kong. In the probit estimation, *Hong Kong listing* is the dependent variable and is a dummy variable. The probit estimation includes firm-level independent variables (*i.e., ROA*, *P/E ratio*, *Sales growth*, *Cash flow*, *Leverage*, and *Bidder size*). The coefficient of *Bidder size* is positive and significant at the 0.01 level, which shows that large firms are more likely to list overseas. The coefficients of *Leverage* and *P/E ratio* are negative and significant at the 0.01 level. Column (2) reports the results of Equation (5) in the second stage. The second stage uses the same dependent variable, independent variable, and control variables as Equation (3) and includes a new control variable *Inverse Mills Ratio (Lambda)*. The coefficient of *Hong Kong listing* is positive and significant at the 0.05 level, which is consistent with the results in Table 4.10. At the same time, the coefficient of *Inverse Mills Ratio (Lambda)* is not significant. Therefore, this indicates that the Hong Kong-listed sample is not associated with self-selection bias in this study.

4.7. Conclusion

This study investigates whether a Hong Kong listing influences Chinese firms' acquisition behaviour. The study firstly examines whether a Hong Kong listing affects acquisition intention by Chinese firms listed in Hong Kong compared with their domestically listed peers in mainland China. The study employs the propensity score matching method to create a matched firm sample that includes Hong Kong-listed and domestically listed Chinese firms from 2001 to 2015. The finding suggests that Hong Kong-listed Chinese firms are less likely to be bidders in acquisitions compared to their domestically listed peers (i.e., avoiding overinvestment). The high agency costs could lead to overinvestment by managers (e.g., Jensen, 1986; Harford, 1999), the finding implies that agency costs of Hong Kong-listed Chinese firms may be reduced compared to their domestically listed peers. Secondly, the study examines whether a Hong Kong listing enables Chinese firms to make successful acquisition transactions. The study employs an M&A sample that includes 2,591 acquisitions by Chinese listed firms (including Hong Kong-listed and domestically listed firms) over the period from 2001 to 2015. The finding is that Hong Kong-listed Chinese firms are more likely to make successful acquisitions compared to their domestically listed peers. The study also uses interaction terms and finds that Hong Kong-listed Chinese firms make more completed

acquisitions compared with their domestically listed peers based on three M&A deal characteristics (i.e., all-cash payments, private targets and cross-border deals).

Although Hong Kong-listed Chinese firms are less likely to make acquisitions, they are also more likely to make successful acquisitions, compared with their domestically listed peers. This suggests that a Hong Kong listing induces managers that do undertake acquisitions to complete them successfully, and therefore to make effective investment decisions. That is, they avoid acquisitions with a low probability of success. This implies that agency costs of Hong Kong-listed Chinese firms could be reduced as managers avoid wasting resources after a Hong Kong listing, which is in line with agency theory (Jensen and Meckling, 1976; Jensen, 1986). However, this explanation needs to be explored further in future because an acquisition is a complicated process. Additionally, the study employs the interaction term *Hong Kong listing* × *CAR* to examine whether a Hong Kong listing improves Chinese firms' ability to learn from, or listen to, the stock market when they make acquisition decisions. However, the interaction term *Hong Kong listing* × *CAR* does not have a significant coefficient. Roll (1986) states that managers may neglect market signals due to hubris in takeovers. Therefore, whether an improved learning channel is provided by a Hong Kong listing needs to be investigated in future.

Chapter 5 Hong Kong listing and the Payment Method in Acquisitions

5.1. Introduction

The choice of payment method is one of the M&A processes that we do not fully understand (Faccio and Masulis, 2005). China, as the largest emerging country in the world, has experienced rapid development of its economy. Meanwhile, there has been a tendency for Chinese firms to list on overseas stock exchanges in the past two decades and Hong Kong is the first choice for Chinese firms (Pan and Brooker, 2014). As the Hong Kong stock market is an internationally mature market, Hong Kong-listed Chinese firms have opportunities to obtain a listing premium. For example, a Hong Kong listing can provide multiple financing channels for Chinese firms. Also, a Hong Kong listing is a way for Chinese firms to improve their corporate governance. This raises a question: does a Hong Kong listing influence Chinese firms' choice of payment method in acquisitions?

Previous literature shows that the choice of payment method in M&A is driven by various factors. The controlling shareholders of acquirers avoid stock financing in M&A deals because of control loss (Stulz, 1988). Asymmetric information between acquirers and targets affects the choice of cash or stock in M&A deals (Hansen, 1987; Fishman, 1989). Higher growth opportunities induce acquirers to choose stock as a payment method in M&A deals (Martin, 1996; Jung et al., 1996). Acquirers choose stock financing in M&A deals because their equity is relatively overvalued (Shleifer and Vishny, 2003). Managers follow a financing hierarchy in M&A deals based on the pecking order theory (Myers, 1984). Cross-listing studies examine the use of cash or stock for payment in takeover deals, with cross-listed firms found to increase the proportion of stock (Tolmunen and Torstila, 2005; Kumar and Ramchand, 2008). Tolmunen and Torstila (2005) and Burns et al. (2007) argue that equity plays the role of an "acquisition currency" for cross-listed firms in cross-border M&A deals. Kumar and Ramchand (2008) find that cross-listing provides the opportunity for acquirers to reduce acquisition costs by using stock to finance international takeovers.

This study examines whether a Hong Kong listing influences the payment choice of

acquirers (i.e., all-cash, all-equity, or mixed payment) in corporate acquisitions. Further, the study also examines whether an acquirer's excess cash affects the choice of payment method in acquisitions. Finally, the study examines the acquirer's abnormal return during the M&A announcement period. The sample includes 2,047 completed acquisitions made by Chinese firms during the period between 2001 and 2015. First, the findings indicate that Hong Kong-listed Chinese firms are more likely to choose all-cash payments in acquisitions compared to their domestically listed peers. However, the all-cash payment is less used in cross-border deals. Second, the findings indicate that the high level of excess cash could induce Hong Kong-listed Chinese firms to choose all-cash payments in acquisitions. Third, Hong Kong-listed Chinese firms are more likely to experience positive abnormal returns when they choose all-cash payments in acquisitions compared to their domestically listed peers.

This study makes two valuable contributions to the literature. First, the unique M&A sample includes M&A deals for all three categories of Chinese firms (i.e., H-share, Red chip, and P chip) that are listed on the SEHK. The study finds that the effect of a Hong Kong listing is different for the three categories of Chinese firms on the SEHK. The study finds that P chip firms are more likely to use equity as a payment method in large M&A transactions. However, non-P chip firms (i.e., H-share and Red chip firms) exhibit different behaviour in their choice of payment methods, that is, they choose all cash in large M&A transactions. Second, the study investigates the payment method used by Hong Kong-listed Chinese firms involved in acquisitions, to examine whether Chinese firms change their financing channels in acquisitions by listing in a more developed stock market, Hong Kong, thereby contributing to the limited literature about foreign listing and M&A. Previous literature shows mixed findings on the question of whether a foreign listing enhances the proportion of equity financing in M&A deals. Tolmunen and Torstila (2005) find that cross-listed firms in the US stock market are more likely to increase the proportion of equity as the "acquisition currency" after cross-listing while Burns et al. (2007) report that cross-listed firms in the US stock market rarely use equity as a payment method in acquisitions. The present study provides a unique M&A sample by including all three categories of Chinese firms (i.e., H-share, Red chip, and P chip) and finds that all-cash payments are popularly chosen by Hong Kong-listed Chinese firms. Also, Hong Kong-listed Chinese firms tend to choose cash rather than equity because of the high level of excess cash, which is consistent with the pecking order theory (Myers, 1984).

The remainder of this study is organized as follows. Section 5.2 reviews the related literature and develops hypotheses. Section 5.3 presents the sample and methodology. Section 5.4 reports the empirical findings and Section 5.5 reports the results of the robustness tests. Section 5.6 provides conclusions and limitations.

5.2. Related literature and hypotheses development

5.2.1. Agency costs, corporate control and the payment method

The controlling shareholders of acquirers are reluctant to use stock financing in M&A deals because stock financing may lead to a loss of control (Stulz, 1988). Stulz (1988) investigates the effect of voting rights on financing policies and firm value in M&A. He finds that voting rights controlled by management have a significant impact on tender offers and shareholders' wealth. An increase in voting rights leads to a decrease in the probability of successful tender offers. The change in shareholders' wealth depends on the managerial control of voting rights. The findings indicate that M&A financing decisions are affected by management's private benefits, that is, how to maintain corporate control. Managers dislike stock financing in M&A deals as it leads to a loss of control in their firms.

Empirically, Amihud et al. (1990), Martin (1996), Ghosh and Ruland (1998) and Faccio and Masulis (2005) find that management shareholdings of acquirers have a negative effect on stock financing in M&A deals, which supports the theory of Stulz (1988). Amihud et al. (1990) examine whether corporate control has an impact on the choice of financing in acquisitions. They argue that the risk of losing control is the main concern on whether to choose cash or stock in acquisitions. Their results suggest that the larger the managerial ownership of the acquiring firm the greater the motivation to choose cash financing. Lower managerial ownership of the acquiring firm is associated with negative abnormal returns when using stock financing. In general, their results indicate that corporate control considerations have a significant impact on the choice of financing method.

Martin (1996) examines the motivation for the payment method in acquisitions using a sample of 846 domestic acquisitions by firms in the US from 1978 to 1988. The findings suggest that there is a positive relationship between the acquirer's growth opportunities

(measured using Tobin's Q) and stock payment; that is, an acquirer with a higher Tobin's Q is more likely to use stock to finance acquisitions. Acquirer managerial ownership is not a strong factor that affects the use of stock payment in acquisitions. Also, the likelihood of stock payment increases for an acquirer with higher abnormal returns before the M&A deals. The likelihood of stock payment decreases for an acquirer with higher cash availability, blockholdings, or in tender offers.

Faccio and Masulis (2005) focus on European M&A transactions from 1997 to 2000 and find that European bidders' payment choice is strongly affected by corporate governance concerns and debt financing constraints. The powerful controlling shareholder of bidders prefer to choose cash in transactions; also, when the control of a bidder's dominant shareholders is threatened, cash payment is a good choice. European bidders have a high likelihood of using stock payment when they have a weaker financial condition. The effect of dominant shareholders on M&A financing decisions is more significant than Martin (1996)'s findings based on US data.

Accordingly, Ghosh and Ruland (1998) consider the effect of managers both for acquiring and target firms. They examine how managers' preferences for control rights affect the choice of payment method in acquisitions. The results show that managers of target firms prefer stock offers as it related to their careers. They argue that managers of target firms have a more significant influence in choosing stock as the payment method than managers from acquiring firms. They also find that managers of target firms have a higher probability of retaining their jobs in combined firms when receiving stock offers rather than cash offers.

5.2.2. Asymmetric information and the payment method

Asymmetric information is considered as one important factor that affects the choice of payment method in M&A deals. Hansen (1987) develops a theory to explain the choice of the exchange medium in M&A based on asymmetric information. Under conditions of asymmetric information, the target and acquiring side bargain for the use of stock or cash in transactions. He argues that acquirers tend to finance with stock when asymmetric information about the target valuation is high. Chemmanur et al. (2009) examine a large sample of acquisitions by public US firms from 1978 to 2004 to investigate how private information affects the choice of payment method. They argue that private information

about acquirers and targets together determines the choice of the medium of exchange in acquisitions. Luypaert and Van Caneghem (2017) also consider the two sides in M&A deals. They investigate the joint effect of information asymmetry and uncertainty of two participants (i.e., bidders and targets) on payment consideration and market returns in M&A using a large sample of M&A deals from 1994 to 2011. They find that bidders are more likely to use stock offers when targets are characterized by higher uncertainty, which is consistent with the risk-sharing argument of Hansen (1987). They also find that opaque targets induce bidders to use cash offers, which is consistent with the notion that bidders exploit superior information strategically. Through cash offers, the bidders can avoid sharing higher gains with target shareholders. In addition, Fishman (1989) develops a model to study the exchange medium in acquisitions under asymmetric information and includes the effect of competitive bidders. The model suggests that a stock offering can motivate target management to make efficient decisions and that a cash offer has the advantage of pre-empting potential competition by signalling a high valuation for the target.

The abnormal return is also examined to the link between asymmetric information and payment method in M&A. Moeller et al. (2007) investigate whether the diversity of opinion and information asymmetry has an impact on acquirer abnormal returns. They select a large sample of acquisitions that are only cash or only equity offers from 1980 to 2002. They report that there is no obvious difference in acquirer abnormal returns when using different payments in acquiring private targets or public targets after controlling for uncertainty proxies. Their findings challenge the theory that diversity of opinion and information asymmetry negatively affect acquirer abnormal returns in equity offers. Officer et al. (2009) offer an explanation that acquirers enjoy higher announcement returns when using stock offers in takeovers. They argue that information asymmetry about the value of the target plays an important role in the higher announcement return. If a target is difficult to value, regardless of its public status, higher announcement returns arise when using stock offers. Stock offers decrease the probability of overpayment when the target value is uncertain, which is consistent with the risk-sharing argument of Hansen (1987). Although their empirical results are based on a sample of private targets in the US from 1995 to 2004, they confirm that the effects of target-valuation uncertainty are also obvious in the sample of public targets in the same period.

5.2.3. Growth opportunities, financial condition and the payment method

Acquirers with higher growth opportunities prefer to use the stock as a payment method in M&A deals (e.g., Martin, 1996; Jung et al., 1996). Martin (1996) measures growth opportunities as Tobin's Q while Jung et al. (1996) use the Market-to-Book ratio. Accordingly, acquirers prefer to stock financing in M&A deals when their equities are relatively overvalued to reduce acquisition costs (Shleifer and Vishny, 2003). Shleifer and Vishny (2003) develop a theory to explain acquisitions driven by misvaluations of the combining firms. Their theory indicates how firms can be misvalued in an inefficient financial market. In these circumstances, rational managers tend to make acquisitions in an inefficient market to obtain high returns. This is an example of arbitrage by rational managers in an inefficient market. Chemmanur et al. (2009) provide support for the market overvaluation theory (Shleifer and Vishny, 2003). They examine a large sample of acquisitions by public US firms from 1978 to 2004 and report four main findings. First, overvalued acquirers tend to use stock offers and acquirers of choosing cash offers are correctly valued. Second, the relationship between the extent of acquirer overvaluation and the likelihood of using a stock offer is positive. Third, the extent of an acquirer's under- or overvaluation significantly influences their announcement returns when using stock offers. Fourth, acquirers use cash offers to deter competing bids. Overall, they argue that private information about acquirers and targets together determines the choice of payment method in acquisitions.

Faccio and Masulis (2005) and Yang et al. (2019) both find that stock offers are more likely to be chosen when acquiring firms with a weaker financial condition. Faccio and Masulis (2005) focus on European M&A transactions from 1997 to 2000 and find that European bidders' payment choice is strongly affected by corporate governance concerns and debt financing constraints. European bidders have a high likelihood of using stock payment when they have a weaker financial condition. Recently, Yang et al. (2019) investigate how corporate liquidity affects M&A activity using a large panel of Chinese listed firms' M&As from 1998 to 2015. They find that cash-rich firms have a high likelihood of acquiring other firms than their cash-poor peers. Also, they find that bidders with a higher Tobin's Q (higher stock valuation) are less likely to use cash payment in acquisitions, especially for financially constrained bidders.

5.2.4. Cross-listing and stock financing in M&A

The choice of payment method in M&A has been examined by several cross-listing studies (e.g., Tolmunen and Torstila, 2005; Burns et al., 2007; Kumar and Ramchand, 2008). Tolmunen and Torstila (2005) present empirical evidence about cross-border M&A by European cross-listed firms on US stock exchanges from 1995 to 2000. They find that these European firms are more likely to use equity to acquire US firms in large transactions, and that the proportion of M&A transactions financed with equity increases after cross-listing. Burns et al. (2007) examine whether foreign cross-listed firms in the US stock markets bond themselves to the US legal system using a sample of acquisitions. The results indicate that cross-listed firms rarely use equity as a payment method in acquiring US targets compared with domestic US acquirers. The levels of legal protection in the countries of cross-listed firms affect the payment methods and acquisition premiums in takeovers of US targets. For example, cross-listed firms from countries with poor legal protection need to pay a high premium to acquire US targets and have fewer opportunities to obtain equity financing. Kumar and Ramchand (2008) link cross-listing and agency risk in international takeovers. They investigate the role of international takeover markets in reducing the agency risk of acquirers' dominant shareholders. They argue that potential acquirers strategically list in the same stock market of potential targets and voluntarily dilute control of dominant shareholders to reduce the acquisition costs. Empirically, they examine 364 foreign firms cross-listed in US stock markets from 1990 to 2003. They find that foreign firms are more likely to reduce the proportion of cash in payment methods in takeovers, which reduces agency costs due to the dilution of dominant shareholder control.

Stock financing is considered as a benefit for cross-listed firms to reduce acquisition costs. Tolmunen and Torstila (2005) and Burns et al. (2007) argue that equity plays the role of an "acquisition currency" for cross-listed firms in cross-border M&A deals. Kumar and Ramchand (2008) find that cross-listing is a way to decrease acquisition costs for acquirers when using stock offers in international takeovers. The two studies (Tolmunen and Torstila, 2005; Kumar and Ramchand, 2008) both report that cross-listed firms are associated with increased stock offers in M&A deals. As the Hong Kong stock market is a more developed and mature market compared to mainland Chinese stock markets, stock rather than cash is a more effective and reliable tool in M&A deals. Hong Kong-listed Chinese firms have the opportunity of choosing stock financing in M&A deals to

decrease acquisition costs. Therefore, Hong Kong-listed Chinese firms have the motivation to decrease all-cash payments in potential M&A deals and increase the percentage of stock in the payment method. The first hypothesis and second hypothesis are developed as follows:

Hypothesis 1: *Hong Kong-listed Chinese firms are less likely to use all-cash payments in acquisitions compared with their domestically listed peers.*

Hypothesis 2: *In cross-border acquisitions, Hong Kong-listed Chinese firms are less likely to use all-cash payments compared with their domestically listed peers.*

5.2.5. Pecking order, free cash flow and the gain from M&A

The pecking order theory (Myers, 1984) argues that cash holdings provide a quick way to support expansion opportunities without resorting to costly external financing. Therefore, cash is a desirable asset. The pecking order theory suggests that managers follow a financing hierarchy in which internal financing is firstly considered and then external financing. Martynova and Renneboog (2009) find that the financing decision of acquirers in M&A deals is associated with the pecking order theory. Their sample is a panel of European acquisitions from 1993 to 2001 and both the acquirer and target firms are from Continental Europe and the UK. To examine whether Hong Kong-listed Chinese firms prefer internal financing in acquisitions, compared with their domestically listed peers, excess cash is employed as the measure of internal financing in this study. The third hypothesis is developed as follows:

Hypothesis 3: *Hong Kong-listed Chinese firms with high excess cash are more likely to use all-cash payments in acquisitions compared with their domestically listed peers.*

Jensen (1986) emphasizes the agency conflict between managers and shareholders and indicates that managers usually engage in bad acquisitions in a firm with high free cash flow. Harford (1999) reports consistent empirical evidence to support the free cash flow hypothesis of Jensen (1986) by examining the relationship between cash reserves and acquisitions. Namely, cash-rich firms have a higher likelihood of making diversified acquisitions whereas these acquisitions are value-declining. His findings suggest that there are agency costs in cash-rich firms. Furthermore, Harford et al. (2012) uncover

several channels through which entrenched managers can destroy value in acquisitions, using a large sample of takeovers conducted by US acquirers between 1990 and 2005. They argue that entrenched managers usually avoid acquiring private targets or using all-equity offers in acquisitions. Also, entrenched managers prefer to choose lower synergy targets or pay a higher premium for good targets in acquisitions. In the case of China, Yang et al. (2019) investigate how corporate liquidity affects M&A activity using a large panel of Chinese listed firms' M&As from 1998 to 2015. They find that cash-rich firms have a high likelihood of acquiring other firms than their cash-poor peers. However, cash acquisitions are value-destroying and are observed to result in both poor short-term and long-term performance.

Corporate governance significantly influences the gain of M&A deals. Masulis et al. (2007) examine the relation between corporate governance and the gain of firm acquisitions. They use a large sample of acquisitions from 1990 and 2003 and report that acquirers with different levels of antitakeover provisions have different abnormal returns during the announcement period. Especially, acquirers with more antitakeover provisions have a lower bidder return. The findings imply that managers tend to develop and implement worse acquisition decisions with less pressure from the market for corporate control. They also report that acquirers in a competitive industry enjoy a higher abnormal announcement return, as well as when acquirers have an effective board (e.g., separating the role of CEO and chairman). Wang and Xie (2009) investigate the relation between corporate governance and the synergistic gains of M&A. They examine 396 completed domestic acquisitions conducted by US firms from 1990 to 2004 and find that higher synergy is created when an acquirer has a higher level of corporate governance rather than the target in an acquisition. They also argue that corporate governance can transfer between the acquirers and targets, and both the acquirers and targets can obtain higher returns from the acquisition. Also, they report that the difference between shareholder rights has a positive impact on the operating performance of the combined firms. The bonding hypothesis (Coffee, 1999 and Stulz, 1999) argues that firms list on a new stock market to bond themselves to better legal, regulatory, and capital market institutions. The Hong Kong stock market has higher accounting, legal, and governance standards than mainland Chinese stock markets. Therefore, a Hong Kong listing is a way to improve Chinese firms' corporate governance. Hong Kong-listed Chinese firms should have better corporate governance compared to their domestic peers listed in the mainland

Chinese stock markets. Investors will experience positive stock market reactions when Hong Kong-listed Chinese firms make an acquisition decision using all-cash as the payment method. The fourth hypothesis is developed as follows:

Hypothesis 4: *Hong Kong-listed Chinese firms experience positive abnormal returns when using all-cash as the payment method in acquisitions compared to their domestically listed peers.*

5.3. Data and research method

5.3.1. Sample

The initial sample includes all acquisitions made by Chinese listed firms across 15 years (from 01.01.2001 to 31.12.2015). The acquisitions are reported in the database S&P Capital IQ. These Chinese bidders are domestically listed firms (A-share) on the Shanghai Stock Exchange (SSE) or the Shenzhen Stock Exchange (SZSE) and Hong Kong-listed firms (H-share, Red chip and P chip) on the Main Board of Stock Exchange of Hong Kong (SEHK). Firstly, all acquisitions made by Chinese listed firms are collected from the database S&P Capital IQ. There are 2,029 acquisitions reported on the Shanghai Stock Exchange (SSE) and 2,112 acquisitions reported on the Shenzhen Stock Exchange (SZSE). There are 3,830 acquisitions reported on the Stock Exchange of Hong Kong (SEHK) from 2001 to 2015 and it is necessary to identify which deals are made by Chinese listed firms (i.e., H-share, Red chip, P chip). Then, these acquisitions made by Chinese listed firms are classified into one of the categories shown in Table 5.1 below, using the following criteria: (1) A-share firms, if the bidders are listed on the Shanghai Stock Exchange (SSE) or the Shenzhen Stock Exchange (SZSE) from 01.01.2001 to 31.12.2015 and financial data is reported in DataStream; (2) Hong Kong-listed Chinese firms, if the bidders are listed firms on the Stock Exchange of Hong Kong (SEHK) from 01.01.2001 to 31.12.2015 and financial data is reported in DataStream.

Hong Kong-listed Chinese firms include three categories: H-shares, Red chips and P chips. After checking the acquisitions made by Chinese listed firms on the Stock Exchange of Hong Kong (SEHK), the sample includes 3,423 acquisitions for all Chinese bidders (2,245 completed acquisitions and 1,178 cancelled acquisitions). Those

acquisitions by Chinese listed firms in the financial services sector[66] are excluded from the sample. Also, those deals that miss information about financial variables in the database of DataStream are excluded from the sample. After excluding cancelled acquisitions, the final sample comprises 2,047 completed acquisitions of which 659 acquisitions are made by Hong Kong-listed Chinese firms and 1,388 acquisitions are made by Chinese domestically listed firms. Table 5.1 presents the details of the different categories of Chinese bidders. Table 5.2 displays the geography of the targets in cross-border[67] acquisitions.

Table 5.1 Completed acquisitions by different types of Chinese bidders
This table reports all completed acquisitions by Chinese bidders in the sample from 2001 to 2015. The M&A data is collected from S&P Capital IQ. The different firm types are classified by the author.

Firm type	Completed acquisitions	Percentage of total
A-share	1,388	67.81
H-share	220	10.75
P chip	328	16.02
Red chip	111	5.42
Total	2,047	100

[66] Real estate firms are not excluded.
[67] A cross-border deal is defined as one in which the acquirer and target are from different countries. In the thesis, Hong Kong and Macau are considered as foreign countries because of their different economic and legal system compared to mainland China. For example, Hong Kong-listed Chinese firms acquiring Chinese firms from mainland China is considered as cross-border deals. Similarly, Chinese firms from mainland China acquiring Hong Kong firms are also considered as cross-border deals.

Table 5.2 Geographical distribution of the targets in cross-border acquisitions
This table reports the geography of the targets in the sample from 2001 to 2015. The data is collected from S&P Capital IQ. The headquarter is the main information to locate the target's country.

Panel A: Targets of Hong Kong-listed bidders

Country	Freq.
Australia	2
Belgium	1
British Virgin Islands	17
Canada	2
Cayman Islands	2
China	76
Germany	5
Indonesia	1
Italy	2
Japan	1
Kazakhstan	1
Kyrgyzstan	1
Macau	5
Myanmar	1
Netherlands	1
New Zealand	1
Singapore	1
Sweden	1
Taiwan	1
US	3
Vietnam	1
Total	126

Panel B: Targets of domestically listed bidders

Country	Freq.
Australia	3
Austria	1
Belgium	1
Bolivia	1
Canada	1
Cayman Islands	1
Czech	1
France	2
Gabon	2
Germany	7
Hong Kong	9
India	3
Japan	1
Kazakhstan	2
Luxembourg	1
Malta	1
Mongolia	1
Netherlands	1
Poland	1
Singapore	1
Taiwan	1
Thailand	1
UK	3
US	1
Vietnam	1
Total	48

5.3.2. Variables and empirical models

5.3.2.1. Hong Kong listing and the choice of payment method

To examine the choice of payment method for Hong Kong-listed Chinese acquirers, the methodology used is similar to that adopted in previous studies (e.g., Faccio and Masulis, 2005; Tolmunen and Torstila, 2005; Burns et al., 2007). The dependent variable is *All cash* and is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero (e.g., Masulis et al., 2007). The key independent variable is *Hong Kong listing* and is also a dummy variable. If an acquirer is a Hong Kong-listed firm, it is equal to one, otherwise it is equal to zero.

The control variables are selected from bidder characteristics (e.g., *Tobin's Q, Cash ratio, Leverage, Bidder size*) and deal characteristics (e.g., *Transaction value, Relative deal size, Private, Multi-bidder, Cross-border*). Jung et al. (1996) argue that a firm with higher investment opportunities is associated with more stock financing. Faccio and Masulis (2005) employ the Market-to-Book ratio to measure investment opportunities. In this study, *Tobin's Q* is employed as a control variable to account for the investment opportunities of acquirers, in a similar manner to Martin (1996). Tobin's Q is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is employed as a control variable following the pecking order theory of financing (Myers, 1984). Cash ratio is measured as the ratio of cash and short-term investments to total assets. *Leverage* is employed as a control variable to account for a bidder's financial condition (e.g., Faccio and Masulis, 2005; Tolmunen and Torstila, 2005). Leverage is measured as total debt scaled by total assets. Faccio and Masulis (2005) argue that bidder size may affect financing choices in the transaction, and so *Bidder size* is employed as a control variable, measured as the logarithm of total assets.

Transaction value is also employed as a control variable similar to the approaches adopted by Tolmunen and Torstila (2005) and Burns et al. (2007). Transaction value is measured as the logarithm of total deal size. *Relative deal size* is employed as a further control variable in line with Faccio and Masulis (2005). Relative deal size is computed as the transaction value divided by the sum of the transaction value plus the bidder's market capitalization one day before the acquisition announcement. Similar to Faccio and Masulis (2005), the category of targets is also used as a control variable in the study. The variable *Private* is employed as a control variable for private targets and is measured as a dummy variable. If the target is a private firm, it is equal to one, and otherwise it is equal to zero. Chang (1998) argues that acquisitions of private targets may create large blockholders if the acquirer uses stock as the payment method. In this case, the acquirer considers the choice of payment methods. *Multi-bidder* refers to a firm that makes more than one acquisition in one year and it is a dummy variable. Multi-bidder is equal to one if a firm makes more than one acquisition in a year, otherwise it is equal to zero. Finally, *Cross-border* is employed as a control variable to account for the effect of home country bias, following the approach of Faccio and Masulis (2005). Previous studies (e.g., Coval and Moskowitz, 1999; Grinblatt and Keloharju, 2001) document that investors have a

home bias in their portfolios of stocks. Therefore, it is a barrier for cross-listed firms to access external financing from issuing stocks. Burns et al. (2007) report that compared to US firms, non-US firms are less likely to acquire US targets using equity even if cross-listed in the US. They argue that the effect of cross-listing is more limited than often assumed. The cross-border acquisition is defined when the acquirer and target are from different countries. Cross-border is a dummy variable to identify a cross-border acquisition and it is equal to one if the acquisition is cross-border, otherwise it is equal to zero. Taken together, the regression model is expressed as follows:

$$\Pr(\textit{All cash}) = \alpha + \beta\, \textit{Hong Kong listing} + \gamma_1\, \textit{Tobin's Q} + \gamma_2\, \textit{Cash ratio} + \gamma_3\, \textit{Leverage} + \gamma_4\, \textit{Bidder size} + \gamma_5\, \textit{Transaction value} + \gamma_6\, \textit{Relative deal size} + \gamma_7\, \textit{Private} + \gamma_8\, \textit{Multi-bidder} + \gamma_9\, \textit{Cross-border} + \varepsilon \quad (1)$$

5.3.2.2. The effect of excess cash on the payment method

Excess cash is defined as the difference between actual cash and the predicted normal, or expected level of cash for Chinese bidders in the M&A sample. Following the methodology of previous studies (e.g., Opler et al., 1999; Dittmar and Mahrt-Smith, 2007; Frésard and Salva, 2010), this study predicts the expected cash ratio for all Chinese bidders in the sample yearly using the following model:

$$\textit{Cash ratio} = \alpha + \beta_1\, \textit{Tobin's Q} + \beta_2\, \textit{Cash flow} + \beta_3\, \textit{Leverage} + \beta_4\, \textit{Working capital} + \beta_5\, \textit{Capital expenditure} + \beta_6\, \textit{Dividend} + \beta_7\, \textit{R\&D} + \beta_8\, \textit{Bidder size} + \varepsilon \quad (2)$$

Where *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Tobin's Q* represents the firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash flow* is measured by cash flows from operations divided by total assets. *Leverage* is measured as total debt over total assets. *Working capital* is computed as current assets minus current liabilities minus cash over total assets. *Capital expenditure* is measured as capital expenditures divided by total assets. *Dividend* is measured by the total cash paid as dividends over total assets. *R&D* is computed as R&D expenditures over total assets. *Bidder size* is measured as the logarithm of total assets. R&D data is not available for all firms, which causes a large number of missing observations (1,652 missing observations) in the regression estimation using Equation

(2). Similarly, dividend data causes 1,209 missing observations, so if dividend data is missing it is set to zero. Following Frésard and Salva (2010), if R&D data is missing, it is set to zero. In addition, the estimation of Equation (2) includes industry fixed effects.

The residuals of Equation (2) are defined as deviations from expected cash. Firm-year residual observations are sorted into quartiles. For example, if firm-year observations are under the bottom quartile (less than 25%), they are defined as low excess cash; if firm-year observations are over the top quartile (more than 75%), they are defined as high excess cash; if firm-year observations are between the middle two quartiles (between 25% and 75%), they are defined as normal excess cash.

5.3.2.3. Acquirer returns and the payment method

The methodology used to examine bidder returns is similar to that used in previous studies (e.g., Masulis et al., 2007; Harford et al., 2012). The dependent variable is bidder abnormal returns during the announcement period, which is defined as days –2 to +2 relative to the bid announcement on day zero. Therefore, using data from DataStream, 5-day cumulative abnormal returns (CARs) during the event window are computed to measure bidder returns in this study, which is similar to the method employed by Fuller et al. (2002) and Masulis et al. (2007). For Chinese firms listed on the Stock Exchange of Hong Kong (SEHK), the Price Index (PI) of the Hang Seng Index is used to compute the market return and the market model is estimated using 200 days from day −210 to day −11 prior to the event window. For Chinese firms listed on the Shanghai Stock Exchange (SSE), the Price Index (PI) of the SSE Composite Index is used to compute the market return, while for Chinese firms listed on the Shenzhen Stock Exchange (SZSE), the Price Index (PI) of the SZSE Component Index is employed. The independent variable of Equation (3) is *Hong Kong listing*, which is a dummy variable to identify whether a firm is Hong Kong-listed, in which case it is equal to one, and otherwise it is equal to zero. All the control variables have the same definitions as in Equation (1). The regression models can be expressed as follows:

$$CAR = \alpha + \beta\, Hong\ Kong\ listing + \gamma_1\, Tobin's\ Q + \gamma_2\, Cash\ ratio + \gamma_3\, Leverage + \gamma_4\, Bidder\ size + \gamma_5\, Transaction\ value + \gamma_6\, Relative\ deal\ size + \gamma_7\, All\ cash + \gamma_8\, Private + \gamma_9\, Multi\text{-}bidder + \gamma_{10}\, Cross\text{-}border + \varepsilon \quad (3)$$

5.4. Main empirical results

This section describes the sample and empirical results. In this section, the hypotheses are examined.

5.4.1. Descriptive statistics

Accounting variables and stock variables for the sample were collected from DataStream. M&A data were collected from S&P Capital IQ. The sample includes acquisitions (completed deals) by both Hong Kong-listed firms and domestically listed firms from 01.01.2001 to 31.12.2015. In total, there are 659 deals by Hong Kong-listed firms and 1,388 deals by domestically listed firms. Table 5.3 presents the distribution of payment choices in the sample. All-cash payment is the most popularly used form of payment by Chinese bidders. Mixed payments and all-equity both represent a very small percentage in the sample.

Table 5.3 The distribution of payment methods for the sample

This table reports all acquisitions by Chinese bidders in the sample from 2001 to 2015. The data is collected from S&P Capital IQ.

Payment method	Completed acquisitions	Percentage of total
All-cash	1,772	86.57
Mixed payment	45	2.20
All-equity	230	11.24
Total	2,047	100

Table 5.4 presents the details of the descriptive statistics for the main variables used in the study including the distribution of observations before winsorization. All variables are expressed in the Chinese currency (Chinese Yuan Renminbi). Table 5.4 reports that for Hong Kong-listed firms the mean of *All cash* is a little larger than for domestically listed firms. The average of *Tobin's Q* for Hong Kong-listed firms is less than for domestically listed firms. As for the *Cash ratio*, the mean for Hong Kong-listed firms is a little greater than that for domestically listed firms. The average of Hong Kong-listed firms' leverage is a little less than for domestic listed firms' leverage. The average bidder size for Hong Kong-listed firms is a little larger than for domestically listed firms. The transaction value for Hong Kong-listed firms is similar to that of domestically listed

firms. The average *Relative deal size* for Hong Kong-listed firms is a little less than for domestically listed firms. As for target selection, the two means are almost identical. The mean of *Multi-bidder* for Hong Kong-listed firms is a little larger than for domestically listed firms. However, Hong Kong-listed firms are more likely to make cross-border deals than domestically listed firms. Table 5.5 reports the differences between the means of the variables for domestically listed firms and Hong Kong-listed firms. For some variables (i.e., *Tobin's Q*, *Cash ratio*, *Leverage*, *Bidder size* and *Cross-border*), there are clear differences between the means of the two groups (domestically listed firms and Hong Kong-listed firms). Table 5.6 reports the results of the Pearson correlation matrix for variables in the analysis and it shows a relatively low correlation between most independent variables.

Table 5.4 Descriptive statistics

This table reports the descriptive statistics of the sample used in the analysis. The sample includes both Hong Kong-listed firms and domestically listed firms from 2001 to 2015. All variables are expressed in Chinese currency (Chinese Yuan Renminbi) when defined in this study. *All cash* is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Leverage* is measured as total debt over total assets. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization one day before the acquisition announcement. *Private* is a dummy variable equal to one if the target is a private firm and otherwise it is equal to zero. *Multi-bidder* is a dummy variable if the acquirer makes more than one deal in a year and otherwise it is equal to zero. *Cross-border* is a dummy variable equal to one if the acquisition is a cross-border deal, and otherwise it is equal to zero.

Panel A: Hong Kong listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
All cash	659	0.880	0.325	0.000	1.000	1.000
Tobin's Q	641	1.581	1.173	0.395	1.197	10.580
Cash ratio	650	0.186	0.133	0.008	0.150	0.861
Leverage	650	0.275	0.148	0.000	0.296	0.717
Bidder size	650	16.793	1.785	10.650	17.108	20.441
Transaction value	659	6.883	0.936	1.099	7.167	7.879
Relative deal size	659	0.536	0.267	0.009	0.508	0.999
Private	659	0.985	0.122	0.000	1.000	1.000
Multi-bidder	659	0.557	0.497	0.000	1.000	1.000
Cross-border	659	0.203	0.403	0.000	0.000	1.000
Panel B: Domestic listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
All cash	1388	0.859	0.348	0.000	1.000	1.000
Tobin's Q	1258	2.283	2.589	0.755	1.548	34.282
Cash ratio	1374	0.156	0.103	0.002	0.132	0.779
Leverage	1374	0.307	0.168	0.000	0.315	0.812
Bidder size	1374	16.016	1.533	12.032	15.908	20.207
Transaction value	1388	6.873	1.001	1.609	7.206	7.877
Relative deal size	1388	0.542	0.267	0.004	0.520	0.999
Private	1388	0.986	0.116	0.000	1.000	1.000
Multi-bidder	1388	0.536	0.499	0.000	1.000	1.000
Cross-border	1388	0.039	0.193	0.000	0.000	1.000

Table 5.5 Mean difference between domestically listed firms and Hong Kong-listed firms
This table reports the descriptive statistics of the sample used in the analysis. The sample includes both Hong Kong-listed firms and domestically listed firms from 2001 to 2015. All variables are expressed in Chinese currency (Chinese Yuan Renminbi) when defined in this study. *All cash* is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Leverage* is measured as total debt over total assets. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization one day before the acquisition announcement. *Private* is a dummy variable equal to one if the target is a private firm and otherwise it is equal to zero. *Multi-bidder* is a dummy variable if the acquirer makes more than one deal in a year and otherwise it is equal to zero. *Cross-border* is a dummy variable equal to one if the acquisition is a cross-border deal, and otherwise it is equal to zero.

Variables	Domestic listing		Hong Kong listing		t-test for difference in mean
	Observations	Mean	Observations	Mean	
All cash	1388	0.859	659	0.880	-0.022
Tobin's Q	1258	2.283	641	1.581	0.718***
Cash ratio	1374	0.156	650	0.186	-0.029***
Leverage	1374	0.307	650	0.275	0.031***
Bidder size	1374	16.016	650	16.793	-0.793***
Transaction value	1388	6.873	659	6.883	-0.019
Relative deal size	1388	0.542	659	0.536	0.004
Private	1388	0.986	659	0.985	0.001
Multi-bidder	1388	0.536	659	0.557	-0.021
Cross-border	1388	0.039	659	0.203	-0.162***

Table 5.6 Correlation coefficient matrix

This table reports the Pearson correlation coefficient for variables used in the analysis. *All cash* is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. *Hong Kong listing* is a dummy variable equal to one if a firm is listed in Hong Kong and is otherwise equal to zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Leverage* is measured as total debt over total assets. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization one day before the acquisition announcement. *Private* is a dummy variable equal to one if the target is a private firm and otherwise it is equal to zero. *Multi-bidder* is a dummy variable if the acquirer makes more than one deal in a year and otherwise it is equal to zero. *Cross-border* is a dummy variable equal to one if the acquisition is a cross-border deal, and otherwise it is equal to zero.

	All cash	*Hong Kong listing*	*Tobin's Q*	*Cash ratio*	*Leverage*	*Bidder size*	*Transaction value*	*Relative deal size*	*Private*	*Multi-bidder*	*Cross-border*
All cash	1.000										
Hong Kong listing	0.029	1.000									
Tobin's Q	-0.128***	-0.180***	1.000								
Cash ratio	-0.041*	0.118***	0.178***	1.000							
Leverage	0.123***	-0.093***	-0.328***	-0.387***	1.000						
Bidder size	0.248***	0.223***	-0.456***	-0.161***	0.339***	1.000					
Transaction value	-0.068***	0.003	-0.048**	0.006	0.027	0.063***	1.000				
Relative deal size	-0.028	-0.009	-0.012	0.076***	-0.004	0.056**	0.197***	1.000			
Private	-0.035	-0.006	0.026	-0.039*	-0.036	-0.024	-0.031	0.001	1.000		
Multi-bidder	0.093***	0.020	-0.062***	-0.122***	0.154***	0.351***	0.001	-0.056**	0.014	1.000	
Cross-border	-0.143***	0.266***	-0.033	0.022	-0.061***	-0.095***	0.018	0.045**	-0.177***	-0.102***	1.000

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.4.2. Hong Kong listing and the choice of payment method

Table 5.7 reports the main results of Equation (1) by including industry fixed effects for the relationship between Hong Kong listings and payment methods (Hypothesis 1 and Hypothesis 2). The baseline model is shown in Column (1) and the coefficient of *Hong Kong listing* is positive and significant at the 0.10 level. It indicates that Hong Kong-listed Chinese firms are more likely to use the all-cash payment for acquisitions compared to their domestically listed peers. Column (2) includes an interaction term *Hong Kong listing* × *Transaction value* to examine the effect of deal size on payment methods. However, the coefficient of the interaction term *Hong Kong listing* × *Transaction value* is not significant.

Column (3) reports the results only for cross-border deals, which is therefore based on small sample size. The coefficient of *Hong Kong listing* is negative and significant at the 0.01 level. It indicates that Hong Kong-listed Chinese firms are less likely to use all-cash payments in cross-border deals compared with their domestically listed peers. This result shows a similar finding to Kumar and Ramchand (2008) that cross-listed firms decrease the proportion of cash payments in cross-border M&A deals. Tolmunen and Torstila (2005) argue that cross-listing provides an opportunity to use equity to decrease the acquisition cost in cross-border M&A deals. The result of Column (3) also supports this argument that Chinese firms listed in Hong Kong have a better advantage to use the equity in acquisitions compared with their domestically listed peers. Therefore, agency costs of Hong Kong-listed Chinese firms could be reduced in cross-border deals. The variables *Private* and *Cross-border* are automatically missed in Column (3) and Column (4) when using logit regression estimation to avoid collinearity. Column (4) also includes an interaction term *Hong Kong listing* × *Transaction value* to examine the effect of deal size on payment methods. However, the coefficient of interaction term *Hong Kong listing* × *Transaction value* is not significant.

Table 5.7 Hong Kong listing and the payment method

This table reports the estimation of Equation (1) using the logit model that includes industry fixed effects. The dependent variable in all columns is *All cash* and is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. The independent variable *Hong Kong listing* and is also a dummy variable. If an acquirer is listed in Hong Kong, it is a dummy variable equal to one or otherwise zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Leverage* is measured as total debt over total assets. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization one day before the acquisition announcement. *Private* is a dummy variable equal to one if the target is a private firm and otherwise it is equal to zero. *Multi-bidder* is a dummy variable if the acquirer makes more than one deal in a year and otherwise it is equal to zero. *Cross-border* is a dummy variable equal to one if the acquisition is a cross-border deal, and otherwise it is equal to zero. The period of the sample is from 2001 to 2015. All continuous variables are winsorized at the 1% and 99% levels. The standard z-statistics are reported in parentheses. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Full sample	Full sample	Cross-border	Cross-border
	(1) Logit	(2) Logit	(3) Logit	(4) Logit
Hong Kong listing	0.321*	-0.289	-2.023***	-1.972
	(1.72)	(-0.21)	(-2.96)	(-0.37)
Tobin's Q	-0.010	-0.011	0.075	0.075
	(-0.21)	(-0.23)	(0.38)	(0.38)
Cash ratio	0.446	0.441	2.545	2.545
	(0.67)	(0.66)	(1.50)	(1.50)
Leverage	0.759	0.757	-1.064	-1.064
	(1.52)	(1.51)	(-0.69)	(-0.69)
Bidder size	0.377***	0.376***	0.727***	0.727***
	(6.18)	(6.17)	(4.22)	(4.21)
Transaction value	-0.305***	-0.327***	-0.430*	-0.423
	(-3.50)	(-3.22)	(-1.69)	(-0.59)
Hong Kong listing × Transaction value		0.087		-0.007
		(0.44)		(-0.01)
Relative deal size	-0.325	-0.326	0.866	0.866
	(-1.17)	(-1.17)	(1.04)	(1.04)
Private	-2.013*	-2.013*		
	(-1.91)	(-1.91)		
Multi-bidder	-0.063	-0.063	0.820*	0.819*
	(-0.41)	(-0.41)	(1.66)	(1.65)
Cross-border	-1.013***	-1.009***		
	(-4.64)	(-4.61)		
Constant	0.188	0.368	-4.775	-4.822
	(0.12)	(0.23)	(-1.61)	(-0.85)
Observations	1,899	1,899	169	169
Pseudo R^2	0.143	0.143	0.276	0.276
Industry FE	YES	YES	YES	YES

z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As for the control variables of the baseline model reported in Column (1) of Table 5.7, the coefficient of *Bidder size* is positive and significant at the 0.01 level, which suggests that larger bidders are more likely to use all-cash in acquisitions. This is consistent with larger firms being less likely to be financially constrained. The coefficient of *Transaction value* is negative and significant at the 0.01 level, which suggests that all-cash payments are less likely to be chosen in large deals. The coefficient of *Private* is negative and significant at the 0.10 level, which suggests that all-cash payments are less likely to be used if the target is a private firm. The coefficient of *Cross-border* is negative and significant at the 0.01 level, indicating that all-cash payments are less likely for cross-border acquisitions. In addition, the other control variables (i.e., *Tobin's Q, Cash ratio, Leverage, Relative deal size* and *Multi-bidder*) do not have any significant coefficients.

Table 5.8 shows the relationship between Hong Kong listings and payment methods for different types of acquiring firms. In Column (1) and Column (3), the coefficients of *Hong Kong listing* are both not significant. In Column (2) and Column (4), the coefficients of the interaction term *Hong Kong listing* × *Transaction value* show different results. In Column (2), the coefficient of the interaction term *Hong Kong listing* × *Transaction value* is positive and significant at the 0.05 level. For non-P chip firms (i.e., H-shares and Red chips), the coefficient of the interaction term *Hong Kong listing* × *Transaction value* shows a positive marginal effect of a Hong Kong listing to use all-cash payments for large acquisition deals. This indicates that H-share firms and Red chips are more likely to use all-cash payments in large acquisitions compared to their domestically listed peers (A-share firms). One possible explanation is the extent of government ownership of H-share firms and Red chip firms and their political connections to the Chinese government. The motivation for these Chinese firms using all-cash payments may be that the government shareholders of H-share firms and Red chips are reluctant to lose their control rights (see e.g., Stulz, 1988; Amihud et al., 1990; Faccio and Masulis, 2005).

Table 5.8 Hong Kong listing and the payment method (different firm types)

This table reports the estimation of Equation (1) using the logit model that includes industry fixed effects. The dependent variable in all columns is *All cash* and is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. The variable *Hong Kong listing* and is also a dummy variable. If an acquirer is listed in Hong Kong, it is equal to one or otherwise zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Leverage* is measured as total debt over total assets. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization one day before the acquisition announcement. *Private* is a dummy variable equal to one if the target is a private firm and otherwise it is equal to zero. *Multi-bidder* is a dummy variable if the acquirer makes more than one deal in a year and otherwise it is equal to zero. *Cross-border* is a dummy variable equal to one if the acquisition is a cross-border deal, and otherwise it is equal to zero. The period of the sample is from 2001 to 2015. All continuous variables are winsorized at the 1% and 99% levels. The standard z-statistics are reported in parentheses. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Non-P chips vs. A-shares	Non-P chips vs. A-shares	P chips vs. A-shares	P chips vs. A-shares
	(1)	(2)	(3)	(4)
	Logit	Logit	Logit	Logit
Hong Kong listing	0.232	-2.893*	0.141	4.263*
	(1.00)	(-1.94)	(0.57)	(1.70)
Tobin's Q	-0.016	-0.018	-0.009	-0.004
	(-0.33)	(-0.36)	(-0.17)	(-0.08)
Cash ratio	-0.048	-0.082	0.339	0.335
	(-0.06)	(-0.11)	(0.46)	(0.46)
Leverage	0.675	0.697	0.929*	0.951*
	(1.30)	(1.34)	(1.69)	(1.73)
Bidder size	0.338***	0.333***	0.380***	0.388***
	(5.03)	(4.98)	(5.12)	(5.19)
Transaction value	-0.240***	-0.324***	-0.397***	-0.335***
	(-2.68)	(-3.18)	(-4.03)	(-3.28)
Hong Kong listing × Transaction value		0.454**		-0.574*
		(2.10)		(-1.66)
Relative deal size	-0.396	-0.435	-0.194	-0.221
	(-1.31)	(-1.43)	(-0.64)	(-0.73)
Private	-1.681	-1.679	-1.614	-1.642
	(-1.58)	(-1.58)	(-1.52)	(-1.55)
Multi-bidder	-0.177	-0.179	-0.137	-0.141
	(-1.09)	(-1.09)	(-0.83)	(-0.85)
Cross-border	-0.555**	-0.537*	-0.648**	-0.693**
	(-2.01)	(-1.94)	(-2.39)	(-2.53)
Constant	0.175	0.858	0.184	-0.357
	(0.11)	(0.51)	(0.11)	(-0.21)
Observations	1,576	1,576	1,580	1,580
Pseudo R^2	0.108	0.112	0.158	0.160
Industry FE	YES	YES	YES	YES

z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Another possible explanation is that H-share firms and Red chip firms are able to obtain external financial support from the banking system in China. Caves (1996) argues that governments traditionally support their own multinational firms with favourable public policies. In the case of China, the Chinese government usually supports their state-owned firms. Guo et al. (2016) argue that state ownership plays an important role in Chinese firms' overbidding in cross-border acquisitions. In mainland China, almost all of the various banks are state-owned or state-controlled. The four large state-owned commercial banks have a dominant market share between them (Ayyagari et al., 2010).[68] Due to government policies in China, state-owned or state-controlled banks tend to provide funds to state-owned firms. Therefore, the reason for H-share firms and Red chip firms choosing all cash payments in large deals could be the easier access to credit.

In Column (4) of Table 5.8, the coefficient of the interaction term *Hong Kong listing* × *Transaction value* is negative and significant at the 0.10 level. For P chip firms, the negative coefficient of the interaction term *Hong Kong listing* × *Transaction value* shows a negative marginal effect of Hong Kong listings to use all-cash payments for large acquisition deals. This indicates that P chip firms are less likely to use all-cash payments in large acquisitions compared to their domestically listed peers (A-share firms). P chip firms are more likely to increase equity payments in large deals, which suggests that agency costs are reduced in P chip firms. A possible reason for this is that it is more difficult for privately-owned firms to obtain external financial support from the banking system in China compared with state-owned firms (Allen et al., 2005). The results reported in Table 5.8 show the different effects of a Hong Kong listing on payment methods for different firm types. The findings for P chip firms are consistent with those reported by Tolmunen and Torstila (2005) who find that European firms listed in the US are more likely to use equity to acquire US firms in large transactions. However, non-P chip firms (i.e., H-shares and Red chips) exhibit different behaviour in their choice of payment methods (i.e., using all-cash payments).

[68] Chen and Shih (2004) and Cousin (2007) provide a detailed description of the Chinese banking system. The four large state-owned banks include the Industrial and Commercial Bank of China, China Agriculture Bank, China Construction Bank and the Bank of China.

5.4.3. The effect of excess cash on the payment method

Table 5.9 reports the results of the effect of excess cash on the payment method. All models are based on Equation (1) using the logit model including industry fixed effects whereas *Cash ratio* is replaced by *Excess cash*. Column (1) and Column (2) present the results of the full sample. In Column (1), the coefficient of *Hong Kong listing* is positive and significant at the 0.05 level, which is a similar result to that reported in Column (1) of Table 5.7. Column (2) includes an interaction term *Hong Kong listing* × *Excess cash*, but it does not report a significant result. From Column (3) to Column (4), the results of the sub-sample (low excess cash and high excess cash) are displayed. In Column (3) the coefficient of *Hong Kong listing* is positive but not significant. From Column (4) it can be seen that the coefficient of *Hong Kong listing* is positive and significant at the 0.05 level. This indicates that Hong Kong-listed Chinese firms are making acquisitions using the all-cash payment method compared to domestically listed firms when they are operating under better internal financial conditions. The finding suggests that the high level of excess cash induces Hong Kong-listed Chinese firms to choose all-cash payments in acquisitions, which is consistent with the pecking order theory (Myers, 1984). The result of Column (4) supports Hypothesis 3. The variable *Private* is automatically missed in Column (3) and Column (4) when using the logit regression estimation to avoid collinearity.

Table 5.9 The effect of excess cash on the payment method

This table presents the estimation of Equation (1) using the logit model that includes industry fixed effects. Columns (1) and (2) report the results for the full sample, and Column (3) reports the results for low excess cash observations, and Column (4) reports the results for high excess cash observations. Low excess cash observation is under the bottom quartile (less than 25%) and high excess cash observation is under the top quartile (more than 75%). The dependent variable for all models is *All cash* and is a dummy variable. If an acquirer uses all-cash payment for a transaction, it is equal to one, otherwise it is equal to zero. *Hong Kong listing* is the independent variable and a dummy variable to identify whether a firm is listed in Hong Kong or not. If a firm is Hong Kong-listed, *Hong Kong listing* is equal to one, and otherwise it is equal to zero. The control variables are *Tobin's Q*, *Excess cash*, *Leverage*, *Bidder size*, *Transaction value*, *Relative deal size*, *Private*, *Multi-bidder*, *Cross-border*. The period of the sample is from 2001 to 2015. All continuous variables are winsorized at the 1% and 99% levels. The standard z-statistics are reported in parentheses. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Full Sample	Full Sample	Low Excess-cash	High Excess-cash
	(1) Logit	(2) Logit	(3) Logit	(4) Logit
Hong Kong listing	0.422**	0.400**	0.228	1.032**
	(2.17)	(2.05)	(0.61)	(2.50)
Tobin's Q	0.001	0.001	0.141	-0.029
	(0.03)	(0.03)	(1.55)	(-0.33)
Excess cash	0.584	-0.060	-3.853	-1.161
	(0.83)	(-0.07)	(-0.80)	(-0.63)
Hong Kong listing × Excess cash		1.804		
		(1.19)		
Leverage	0.685	0.721	2.457**	0.850
	(1.40)	(1.48)	(2.21)	(0.94)
Bidder size	0.404***	0.411***	0.342***	0.298**
	(6.40)	(6.47)	(2.99)	(2.24)
Transaction Value	-0.279***	-0.283***	-0.312*	-0.247
	(-3.18)	(-3.23)	(-1.91)	(-1.25)
Relative deal size	-0.368	-0.352	-1.265**	0.006
	(-1.30)	(-1.24)	(-2.41)	(0.01)
Private	-1.902*	-1.923*		
	(-1.80)	(-1.82)		
Multi-bidder	-0.160	-0.162	-0.437	-0.053
	(-1.02)	(-1.04)	(-1.56)	(-0.15)
Cross-border	-0.853***	-0.842***	-0.622	-1.283**
	(-3.73)	(-3.67)	(-1.53)	(-2.48)
Constant	-0.457	-0.551	-2.512	-0.096
	(-0.29)	(-0.35)	(-1.11)	(-0.04)
Observations	1,758	1,758	435	412
Pseudo R^2	0.143	0.144	0.149	0.121
Industry FE	YES	YES	YES	YES

z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5.4.4. Acquirer returns and the payment method

Table 5.10 reports the descriptive statistics of cumulative abnormal returns (CARs) used in the analysis before winsorization. As for Hong Kong-listed Chinese bidders, the mean of the CARs is lower than the mean of the CARs for domestically listed bidders, while the median CAR of Hong Kong-listed bidders is larger than that of domestically listed bidders.

Table 5.10 Descriptive statistics of the CARs

This table reports the descriptive statistics of the announcement period abnormal returns used in the analysis. The CAR is defined as a 5-day cumulative abnormal return (CAR) of acquirer firms who announce M&A deals during the event window using the market model. The market model is estimated during the period (−210, −11) days before the event window.

	observations	mean	Std. Dev.	min	p50	max
Hong Kong listing	548	0.014	0.097	-0.289	0.007	0.838
Domestic listing	1162	0.039	0.387	-0.363	0.004	7.457

Table 5.11 shows the effect of payment methods on acquirer returns. In Column (1) and Column (2), the two models examine the effect of payment methods on acquirer returns using the full sample. In Column (1), the coefficient of *Hong Kong listing* is negative and significant at the 0.05 level, which indicates that Hong Kong-listed Chinese firms experience lower acquirer returns compared to domestically listed firms. The coefficient of *All cash* is negative and significant at the 0.01 level, which indicates that all-cash payments in acquisitions are more likely to result in lower acquirer returns compared with other payments (i.e., all-equity or mixed payment). However, the coefficient of the interaction term *Hong Kong listing* × *All cash* is positive and significant at the 0.05 level, which indicates that there is a positive marginal effect of a Hong Kong listing on acquirer returns when these firms choose all cash as the payment method in the acquisition. This could be explained by a bonding effect whereby a Hong Kong listing improves Chinese firms' investor protection. Therefore, the stock market provides positive market reactions to these acquisitions by Hong Kong-listed Chinese firms using all-cash payments (high agency risk), indicating investors' confidence in Hong Kong-listed Chinese firms' investor protection.

Table 5.11 Acquirer returns and the payment method

This table reports the estimation of Equation (3) using the OLS method that includes industry fixed effects. The dependent variable is *CAR (−2,+2)*, a 5-day cumulative abnormal return surrounding the M&A announcement day (−2,+2). *Hong Kong listing* is a dummy variable to identify whether a firm is Hong Kong-listed or not. If a firm is Hong Kong-listed, *Hong Kong listing* is equal to one, and otherwise it is equal to zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Leverage* is measured as total debt over total assets. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization one day before the acquisition announcement. *All cash* is a dummy variable equal to one if an acquirer uses all-cash payments in the transaction, otherwise it is equal to zero. *Private* is a dummy variable equal to one if the target is a private firm and otherwise it is equal to zero. *Multi-bidder* is a dummy variable if the acquirer makes more than one deal in a year and otherwise it is equal to zero. *Cross-border* is a dummy variable equal to one if the acquisition is a cross-border deal, and otherwise it is equal to zero. The period of the sample is from 2001 to 2015. All continuous variables are winsorized at the 1% and 99% levels. The standard t-statistics are reported in parentheses. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Full sample	Full sample	Non-P chips vs. A-shares	P chips vs. A-shares
	(1)	(2)	(3)	(4)
	CAR (−2,+2)	CAR (−2,+2)	CAR (−2,+2)	CAR (−2,+2)
Hong Kong listing	-0.031**	-0.027**	-0.032*	-0.024
	(-2.56)	(-2.03)	(-1.78)	(-1.43)
Tobin's Q		0.003**	0.004***	0.002
		(2.26)	(2.73)	(1.14)
Cash ratio		0.016	0.019	-0.002
		(0.75)	(0.81)	(-0.07)
Leverage		-0.002	0.003	-0.005
		(-0.16)	(0.18)	(-0.29)
Bidder size		-0.001	-0.000	-0.002
		(-0.40)	(-0.17)	(-1.27)
Transaction value		-0.002	-0.001	0.000
		(-1.06)	(-0.45)	(0.11)
Relative deal size		-0.011	-0.016*	-0.004
		(-1.44)	(-1.84)	(-0.45)
All cash	-0.050***	-0.048***	-0.047***	-0.048***
	(-7.19)	(-6.79)	(-6.65)	(-6.79)
Hong Kong listing × All cash	0.029**	0.025*	0.031*	0.021
	(2.23)	(1.80)	(1.69)	(1.22)
Private		-0.008	-0.013	0.002
		(-0.50)	(-0.68)	(0.08)
Multi-bidder		0.006	0.006	0.004
		(1.47)	(1.15)	(0.78)
Cross-border		0.001	0.002	-0.002
		(0.11)	(0.24)	(-0.20)
Constant	0.062***	0.089**	0.078**	0.095**
	(9.78)	(2.51)	(2.00)	(2.33)
Observations	1,710	1,710	1,437	1,435
R-squared	0.042	0.050	0.059	0.058
Industry FE	YES	YES	YES	YES

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The model in Column (2) of Table 5.11 includes all of the control variables (i.e., *Tobin's Q*, *Cash ratio*, *Leverage*, *Bidder size*, *Transaction value*, *Relative deal size*, *Private*, *Multi-bidder*, *Cross-border*). The sign of the coefficient of *Hong Kong listing* remains the same as in Column (1). Similarly, the sign of the coefficient of *All cash* is the same as in Column (1). The coefficient of the interaction term *Hong Kong listing* × *All cash* is also positive and significant, as it is in Column (1), albeit at the 0.10 level. In Columns (3) and (4), the two models report the results for two further sub-samples. Column (3) reports the results of non-P chip firms (H-shares and Red chips) compared with A-share firms. In Column (3), the coefficient of *Hong Kong listing* is still negative and significant, but only at the 0.10 level. The sign of the coefficient for *All cash* remains the same as in Columns (1) and Column (2). The coefficient of the interaction term *Hong Kong listing* × *All cash* is also positive and significant at the 0.10 level, which is consistent with Column (2). In column (3), the coefficient of *Tobin's Q* is positive and significant at the 0.01 level, which indicates that non-P chips (H-shares and Red chips) with higher investment opportunities achieve greater acquirer returns. Column (4) reports the results of P chips compared with A-shares. The coefficient of the interaction term *Hong Kong listing* × *All cash* is not significant, which indicates that the ability of a Hong Kong listing to increase Chinese firms' acquirer returns when using all-cash payments is driven by the non-P chip firms.

5.5. Robustness checks

In this section, the different methods are used to examine the robustness of the main results. Firstly, to correct for the possible self-selection bias of the sample, the Heckman two-stage estimation is employed. Secondly, cancelled deals are included to examine the relationship between Hong Kong listings and the choice of payment method in acquisitions. Thirdly, it employs an alternative measure of the bidder's announcement CAR to examine acquirer returns.

5.5.1. Self-selection bias

To mitigate the potential issues of endogeneity (i.e., self-selection), this study employs the Heckman (1979) two-stage estimation model. Self-selection bias may arise when the treatment group and control group are not randomly from the same population. In this study, the treatment group includes Hong Kong-listed firms and the control group

includes domestically listed firms. In the study, because the Hong Kong-listed sample is not randomly selected, a potential selection bias must be considered seriously. Chinese firms choosing to list in Hong Kong may be self-selected and this could lead to biased results when choosing a dummy variable (i.e., Hong Kong listing) to examine the effect of a Hong Kong listing. To correct for potential self-selection bias, a Heckman (1979) two-step estimation method is employed in the study, which is in line with Doidge et al. (2004), Tolmunen and Torstila (2005) and Foucault and Frésard (2012). The first step is to estimate the mechanism of Hong Kong listing using a probit model with some firm-level variables that may influence a Hong Kong listing decision. The probit model is used to examine whether a Chinese firm makes the decision to choose to list in Hong Kong. To construct the probit model, some firm-level variables (i.e., *ROA*, *P/E ratio*, *Sales growth*, *Cash flow*, *Leverage* and *Bidder size*) are chosen. The first equation of the Heckman (1979) two-step estimation method is a probit model with industry fixed effects that estimates the likelihood of a Hong Kong listing and produces the inverse Mills ratio (Lambda). The first stage is the estimation of the following model:

$$\Pr(\textit{Hong Kong listing}) = \alpha + \beta_1 \textit{ROA} + \beta_2 \textit{P/E ratio} + \beta_3 \textit{Sales growth} + \beta_4 \textit{Cash flow} + \beta_5 \textit{Leverage} + \beta_6 \textit{Bidder size} + \varepsilon \quad (4)$$

Where *Hong Kong listing* is the dependent variable and is also a dummy variable to identify whether a firm has a Hong Kong listing or not. For a firm is a Hong Kong-listed firm, the value is equal to one, otherwise it is equal to zero. Pagano et al. (2002) state that a foreign listing is to obtain foreign capital from the international capital markets to meet firms' growing demands. *ROA* and *Sales growth* are two variables that measure a firm's growing demand, and so are employed in the model. *ROA* is defined as the sum of earnings before interest, taxes, depreciation, and amortization over total assets. *P/E ratio* represents a firm's growth opportunity and is computed as the stock price scaled by earnings per share yearly. *Sales growth* is measured by net sales in year *t* minus net sales in year *t-1* scaled by net sales in year *t-1*. *Cash flow* is measured by cash flows from operations divided by total assets. *Leverage* is measured as total debt scaled by total assets. Pagano et al. (2002) find that large firms are more likely to list abroad. So *Bidder size* is employed in the model and measured as the logarithm of total assets.

The second stage of the Heckman (1979) two-step estimation method is a logit estimation with industry fixed effects to examine the relation between Hong Kong listing and payment methods after adding the inverse Mills ratio (Lambda) to the equation. The inverse Mills ratio (Lambda) is generated from the probit model estimation in the first stage and as an additional control variable in the second stage estimation. If the coefficient of the inverse Mills ratio (Lambda) is significant, and the coefficient of the key variable is consistent with results from the model that is examined, the Heckman correction shows that there is self-selection bias in the treated group (Hong Kong-listed sample). If the inverse Mills ratio (Lambda) is not significant, and the coefficient of the key variable is consistent with results from the model that is examined, in this case, the sample selection of the treated group is assumed to be a random selection from the population. The second stage of the Heckman (1979) two-step estimation method is the following model:

$$\Pr(\textit{All cash}) = \alpha + \beta\ \textit{Hong Kong listing} + \gamma_1\ \textit{Tobin's Q} + \gamma_2\ \textit{Cash ratio} + \gamma_3\ \textit{Leverage} + \gamma_4\ \textit{Bidder size} + \gamma_5\ \textit{Transaction value} + \gamma_6\ \textit{Relative deal size} + \gamma_7\ \textit{Private} + \gamma_8\ \textit{Multi-bidder} + \gamma_9\ \textit{Cross-border} + \gamma_{10}\ \textit{Inverse Mills Ratio (Lambda)} + \varepsilon \quad (5)$$

Where the dependent variable, independent variable and control variables are the same as Equation (1). The difference between Equation (1) and Equation (5) is that there is a new control variable Inverse Mills Ratio (Lambda) added in Equation (5). The Inverse Mills Ratio (Lambda) is computed from the first stage and participates in the second stage estimation.

Table 5.12 Heckman two-stage estimation

This table displays the results of Equation (1) using the Heckman two-stage estimation. Column (1) presents the results of the first stage (probit estimation with industry fixed effects), where *Hong Kong listing* is the dependent variable, measured as a dummy variable to identify whether a Chinese firm lists in Hong Kong or not. The probit estimation includes firm-level independent variables (*i.e.*, *ROA*, *P/E ratio*, *Sales growth*, *Cash flow*, *Leverage*, and *Bidder size*). Column (2) reports the results of the second stage (Logit estimation with industry fixed effects) where *All cash* is the dependent variable and *Hong Kong listing* is the independent variable. *All cash* is a dummy variable. If an acquirer uses all-cash payments in the transaction, it is equal to one, otherwise it is equal to zero. The second stage estimation uses the same control variables from Equation (1) except *Inverse Mills Ratio (Lambda)*, namely *Tobin's Q*, *Cash ratio*, *Leverage*, *Bidder size*, *Transaction value*, *Relative deal size*, *Private*, *Multi-bidder*, *Cross-border*. The *Inverse Mills Ratio (Lambda)* is computed from the first stage and participates in the second stage estimation as an additional control variable. The period of the sample is from 2001 to 2015. The standard z-statistics are reported in parentheses. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Heckman	
	(First-Stage) Probit	Second Stage
Hong Kong listing		0.447**
		(2.15)
Tobin's Q		0.010
		(0.98)
Cash ratio		0.250**
		(2.18)
Leverage		0.124
		(1.16)
Bidder size		0.036***
		(4.05)
Transaction value		-0.005
		(-0.45)
Relative deal size		-0.057
		(-1.35)
Private		-0.124
		(-1.44)
Multi-bidder		0.048**
		(1.98)
Cross-border		-0.182***
		(-6.34)
ROA	1.201*	
	(1.69)	
P/E ratio	-0.007***	
	(-9.47)	
Sales growth	0.013	
	(0.24)	
Cash flow	-0.206	
	(-0.42)	
Leverage	-1.699***	
	(-6.35)	
Bidder size	0.034***	
	(3.37)	
Inverse Mills Ratio		-0.037
		(-1.01)
Observations	1,680	1,680
Industry FE	YES	YES

z-statistics in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 5.12 reports the results of the Heckman correction. Column (1) presents the results of the first stage (probit estimation) to examine why Chinese firms choose to list in Hong Kong. In the probit estimation, *Hong Kong listing* is the dependent variable and is a dummy variable. The probit estimation includes firm-level independent variables (*i.e., ROA*, *P/E ratio*, *Sales growth*, *Cash flow*, *Leverage*, and *Bidder size*). The coefficient of *ROA* is positive and significant at the 0.10 level. The coefficient of *Bidder size* is positive and significant at the 0.01 level, which shows that large firms are more likely to list overseas. The coefficients of *Leverage* and *P/E ratio* are negative and significant at the 0.01 level. Column (2) reports the results of Equation (5) in the second stage. The second stage uses the same dependent variable, independent variable, and control variables as Equation (1) and includes a new control variable *Inverse Mills Ratio (Lambda)*. The coefficient of *Hong Kong listing* is positive and significant at the 0.05 level, which is consistent with the results in Table 5.7. At the same time, the coefficient of the *Inverse Mills Ratio (Lambda)* is not significant. Therefore, this indicates that the Hong Kong-listed sample is not associated with self-selection bias in this study.

5.5.2. Hong Kong listing and payment method (including cancelled deals)

Table 5.13 reports the main results of Equation (1) including both completed and cancelled deals to examine Hypothesis 1. The model includes the same control variables (i.e., *Tobin's Q, Cash ratio, Leverage, Bidder size, Transaction value, Relative deal size, Private, Multi-bidder, Cross-border*) as used in Table 5.7, the coefficient of *Hong Kong listing* is not significant. In summary, there is no relationship between Hong Kong listings and the choice of payment method when including both competed and cancelled deals.

Table 5.13 Hong Kong listing and payment method (including cancelled deals)

This table reports the estimation of Equation (1) using the logit model that includes industry fixed effects. The dependent variable in all columns is *All cash* and is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. The independent variable *Hong Kong listing* and is also a dummy variable. If an acquirer is listed in Hong Kong, it is a dummy variable equal to one or otherwise zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Leverage* is measured as total debt over total assets. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization one day before the acquisition announcement. *Private* is a dummy variable equal to one if the target is a private firm and otherwise it is equal to zero. *Multi-bidder* is a dummy variable if the acquirer makes more than one deal in a year and otherwise it is equal to zero. *Cross-border* is a dummy variable equal to one if the acquisition is a cross-border deal, and otherwise it is equal to zero. The period of the sample is from 2001 to 2015. All continuous variables are winsorized at the 1% and 99% levels. The standard z-statistics are reported in parentheses. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Completed and cancelled deals
Hong Kong listing	-0.079
	(-0.47)
Tobin's Q	0.002
	(0.06)
Cash ratio	1.218**
	(2.11)
Leverage	0.440
	(1.07)
Bidder size	0.463***
	(8.73)
Transaction value	-0.324***
	(-4.36)
Relative deal size	-0.484**
	(-2.06)
Private	-1.105
	(-1.45)
Multi-bidder	-0.065
	(-0.51)
Cross-border	-0.851***
	(-4.41)
Constant	-1.871
	(-1.49)
Observations	2,897
Pseudo R^2	0.119
Industry FE	YES

z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5.5.3. Acquirer returns and the payment method (Alternative measure of the bidder's announcement CAR)

Table 5.14 reports the effect of payment methods on acquirer returns for Chinese firms using an alternative measure of the bidder's announcement CAR. The dependent variable in all columns is the 3-day cumulative abnormal return surrounding each M&A announcement day rather than the 5-day CAR. The methodology to calculate the 3-day cumulative abnormal return is the same as that explained in Table 5.11. All models are estimated using the OLS method that includes industry fixed effects. Unlike the results in Table 5.11, the coefficients of *Hong Kong listing* are not significant in any of the models. The coefficients of *All cash* are significant and keep the same signs reported in Table 5.11. However, the coefficients of the interaction term *Hong Kong listing* × *All cash* are not significant in any of the models. Therefore, the finding in Table 5.11 of a positive marginal effect of a Hong Kong listing on acquirer returns using all cash as the payment method is not robust to this change in the CAR window. In summary, this study finds some evidence that Hong Kong-listed Chinese firms are more likely to obtain positive abnormal returns when using all-cash payments in acquisitions compared with their domestically listed peers, but only when the CARs are measured over a 5-day window.

Table 5.14 Acquirer returns and the payment method (Alternative measure of the bidder's announcement CAR)

This table reports the estimation of Equation (3) using the OLS method that includes industry fixed effects. The dependent variable is *CAR (−1,+1)*, a 3-day cumulative abnormal return surrounding the M&A announcement day (−1,+1). *Hong Kong listing* is a dummy variable to identify whether a firm is Hong Kong-listed or not. If a firm is Hong Kong-listed, *Hong Kong listing* is equal to one, and otherwise it is equal to zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Leverage* is measured as total debt over total assets. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization one day before the acquisition announcement. *All cash* is a dummy variable equal to one if an acquirer uses all-cash payments in the transaction, otherwise it is equal to zero. *Private* is a dummy variable equal to one if the target is a private firm and otherwise it is equal to zero. *Multi-bidder* is a dummy variable if the acquirer makes more than one deal in a year and otherwise it is equal to zero. *Cross-border* is a dummy variable equal to one if the acquisition is a cross-border deal, and otherwise it is equal to zero. The period of the sample is from 2001 to 2015. All continuous variables are winsorized at the 1% and 99% levels. The standard t-statistics are reported in parentheses. *, **, *** indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	Full sample	Full sample	Non-P chips vs. A-shares	P chips vs. A-shares
	(1)	(2)	(3)	(4)
	CAR (−1,+1)	CAR (−1,+1)	CAR (−1,+1)	CAR (−1,+1)
Hong Kong listing	-0.009	-0.007	-0.020	0.002
	(-0.99)	(-0.74)	(-1.52)	(0.19)
Tobin's Q		0.002	0.002*	0.001
		(1.42)	(1.90)	(0.71)
Cash ratio		0.039**	0.039**	0.024
		(2.50)	(2.24)	(1.43)
Leverage		0.003	0.004	0.005
		(0.31)	(0.32)	(0.47)
Bidder size		-0.001	-0.000	-0.002
		(-0.76)	(-0.06)	(-1.16)
Transaction value		-0.001	-0.001	0.001
		(-0.84)	(-0.62)	(0.35)
Relative deal size		-0.011*	-0.016**	-0.006
		(-1.84)	(-2.44)	(-0.88)
All cash	-0.035***	-0.034***	-0.035***	-0.034***
	(-6.79)	(-6.43)	(-6.64)	(-6.51)
Hong Kong listing × All cash	0.010	0.007	0.018	-0.000
	(1.00)	(0.69)	(1.32)	(-0.03)
Private		-0.003	-0.010	0.001
		(-0.27)	(-0.74)	(0.09)
Multi-bidder		0.005	0.004	0.003
		(1.56)	(1.25)	(0.88)
Cross-border		0.001	0.006	-0.003
		(0.21)	(0.83)	(-0.50)
Constant	0.044***	0.064**	0.057**	0.059*
	(9.21)	(2.39)	(1.98)	(1.94)
Observations	1,711	1,711	1,438	1,436
R-squared	0.040	0.051	0.059	0.059
Industry FE	YES	YES	YES	YES

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5.6. Conclusion

This study investigates whether a Hong Kong listing affects Chinese firms' payment methods in acquisitions. The sample includes 2,047 completed acquisitions made by Chinese listed firms that are also listed on the Hong Kong stock market and the mainland Chinese stock markets over the period from 2001 to 2015. Firstly, the study examines the effect of a Hong Kong listing on the payment choice of Chinese firms that are involved in acquisitions. The findings show that Hong Kong-listed Chinese firms are more likely to use all-cash payments in acquisitions compared with their domestically listed peers. However, in cross-border acquisition deals, the all-cash payment method is less used by Hong Kong-listed Chinese firms, which suggests that equity is increased and plays the role of an "acquisition currency". Also, state-owned firms (i.e., H-shares and Red chips) are more likely to use all-cash payments in large acquisitions compared with their domestically listed peers. However, privately-owned firms (P chips) are more likely to increase equity payments in large deals compared to their domestically listed peers. This indicates that the relationship between Hong Kong listings and payment methods depends on the different categories of acquiring firms. Cash payments are related to high agency risk, while equity payments are related to low agency risk (Stulz, 1988). The reason for this is that equity payments can create external blockholders from target firms in takeovers, which increases monitoring (Shleifer and Vishny, 1986). Therefore, agency risk is reduced for P chip firms.

Secondly, the study examines whether the acquirer's excess cash can affect the choice of the payment method in acquisitions. The findings show that the high level of excess cash induces Hong Kong-listed Chinese firms to choose all-cash payments in acquisitions, which is consistent with the pecking order theory (Myers, 1984). Finally, the study examines the acquirer's abnormal returns during the M&A announcement period. The findings suggest that Hong Kong-listed Chinese firms are more likely to obtain positive abnormal returns when using all-cash payments in acquisitions compared to their domestically listed peers, especially for non-P chip firms (i.e., H-share and Red chip). Positive abnormal returns suggest that investors' confidence increases in Hong Kong-listed Chinese firms' acquisition behaviour. This implies that agency costs in Hong Kong-listed Chinese firms are reduced when using all-cash (high agency risk) as the method of payment in acquisitions. This could be linked to the bonding hypothesis

(Coffee, 1999 and Stulz, 1999). However, as M&A decisions are complicated, further research is necessary to better understand the precise reasons why the stock market reacts to such M&A decisions.

Chapter 6 Conclusions

This thesis employs three empirical studies to investigate the effect of a Hong Kong listing on Chinese firms' corporate investment or M&A activities. Chapter 3 (the first study) investigates whether a Hong Kong listing improves Chinese firms' investment efficiency using a large sample of Hong Kong-listed Chinese firms during the period 2001-2015. The chapter employs two different measures of investment efficiency. First, it examines the effect of a Hong Kong listing on the sensitivity of investment expenditure to investment opportunities. The findings show that a Hong Kong listing improves the sensitivity of investment to investment opportunities (Tobin's Q). Second, the chapter examines whether Hong Kong-listed Chinese firms are associated with underinvestment or overinvestment compared with their domestically listed peers. The findings suggest that Hong Kong-listed Chinese firms are not associated with underinvestment. Taken together, these findings suggest that a Hong Kong listing improves Chinese firms' investment efficiency. These findings can be explained by two main frictions (i.e., information asymmetry and agency problems) associated with firm-level investment efficiency (Stein, 2003) being reduced for Hong Kong-listed Chinese firms.

Chapter 4 (the second study) examines whether a Hong Kong listing influences Chinese firms' acquisition behaviour. Firstly, the chapter investigates whether Hong Kong-listed Chinese firms are more likely to attempt acquisitions compared with their domestically listed peers. The propensity score matching method is employed to find a matched sample of firms that are Hong Kong-listed and domestically listed over the period 2001-2015. The findings show that Hong Kong-listed Chinese firms are less likely to be bidders compared to their domestically listed peers (i.e., avoid overinvestment). Secondly, the chapter examines whether a Hong Kong listing enables Chinese firms to make successful acquisition decisions. The M&A sample includes over 2,000 acquisitions by Chinese listed firms (including Hong Kong-listed and domestically listed firms) during the period 2001-2015. The findings indicate that a Hong Kong listing enables Chinese firms that undertake acquisitions to complete them successfully compared to their domestically listed peers. Taken together, these findings suggest that a Hong Kong listing induces managers that do undertake acquisitions to complete them successfully, and therefore to make effective investment decisions. That is, they avoid acquisitions with a low probability of success. This implies that the agency costs of Chinese firms are mitigated

after a Hong Kong listing, which is consistent with agency theory (Jensen and Meckling, 1976; Jensen, 1986). Additionally, the chapter finds that Hong Kong-listed Chinese firms make successful acquisition deals, based on some M&A deal characteristics (i.e., all cash payments, private targets and cross-border deals), compared to their domestically listed peers.

Chapter 5 (the third study) employs an M&A sample that includes over 2,000 completed acquisitions made by Chinese listed firms during the period 2001-2015. Firstly, the chapter examines the relation between Hong Kong listings and payment methods in acquisitions. The findings show that Hong Kong-listed Chinese firms are more likely to choose all-cash payments in acquisitions compared with their domestically listed peers. However, in cross-border deals, all-cash payments are less frequently used than equity payments. Specifically, state-owned firms (H-shares and Red chips) are more likely to use all-cash payments in large acquisitions compared to their domestically listed peers. However, privately-owned firms (P chips) are more likely to increase equity in payments for large deals. Therefore, the agency costs of Hong Kong-listed Chinese firms are reduced only for privately-owned firms (P chips) or in cross-border deals. The reason is that the increased use of equity increases monitoring (Shleifer and Vishny, 1986). Secondly, the study examines whether the acquirer's excess cash can affect the choice of the payment method in acquisitions. The findings indicate that high levels of excess cash could influence Hong Kong-listed Chinese firms to choose the all-cash payment method in acquisitions, which is in line with the pecking order theory (Myers, 1984). Finally, the study examines the acquirer's abnormal returns during the M&A announcement period. The findings report that Hong Kong-listed Chinese firms are more likely to be associated with positive abnormal returns when they use the all-cash payment method in deals, compared with their domestically listed peers. Positive abnormal returns from the stock market suggest that investors have confidence in Hong Kong-listed Chinese firms even if they choose all-cash payments (with high agency risk). This implies that a Hong Kong listing reduces agency costs for Chinese firms, at least to some extent.

The thesis inevitably has some limitations, in two principal ways. Firstly, when deciding upon the sample selection, the thesis defines P chip firms listed on the Stock Exchange of Hong Kong (SEHK) employing two key criteria, based on the approach of Filip et. al. (2020). First, potential P chip firms are those firms listed on the Stock Exchange of Hong

Kong (SEHK) that are not classified as H-shares or Red chips. Second, the geographical location of the corporate headquarters is used to identify a firm from mainland China, that is, if a firm is listed in Hong Kong, and is not classified as a H-shares or Red chip firm, and is headquartered in mainland China, it is classified as a P chip. Third, if it is not possible to determine the location of a company's headquarters, the geographic segmentation of the company's assets and revenues is then used to classify a Chinese firm as being from mainland China or not: namely, if a firm's revenue (100%) is derived from mainland China or a firm's assets (100%) are located in mainland China, it is classified as a P chip firm. This third criterion used in the thesis is different from the method used by Filip et. al. (2020) that is based on the ultimate controlling shareholders and the location of the majority of assets and revenues (60% assets and 80% revenues) to confirm that a firm is from mainland China. The process of confirming a firm's ultimate controlling shareholders is a challenging job, especially for Chinese firms. Also, measuring the influence of control power (i.e., companies or individuals) on a firm is difficult. Therefore, in the thesis, the author has increased the proportion of revenue or assets (from 60% to 100%) to mitigate the impact of situations where it is not possible to identify the ultimate controlling shareholders. In fact, the classification of P chip firms in the thesis is broader than some classification schemes that include more complicated definitions for P chips (for example, FTSE Russell).

Secondly, the thesis addresses the endogeneity problem by using Heckman's (1979) selection model. The use of this selection model follows the approach of previous studies (e.g., Doidge et al., 2004; Tolmunen and Torstila, 2005; Foucault and Frésard, 2012) to choose suitable variables. Of course, the implementation of selection models has limitations in that there are potential multicollinearity problems. For example, Lennox et al. (2012) point out that Heckman's (1979) selection model could cause multicollinearity problems in the estimation.

The thesis leaves some areas to be addressed in future studies. For example, Chapter 3 finds that a Hong Kong listing improves Chinese firms' investment efficiency. This could be explained by an improved information channel provided by the Hong Kong stock market. Chinese firms' stock prices become more informative after a Hong Kong listing. Therefore, managers can learn from their stock prices to make better investment decisions through an improved information channel. However, Chapter 3 does not

specifically test this information channel. Furthermore, the thesis suggests some additional areas for further research. The findings indicate that Hong Kong-listed Chinese firms have better investment efficiency and make better M&A decisions than their domestically listed peers. In the future, studies could investigate some firm-specific characteristics that might provide reasons for the positive effect of a Hong Kong listing on investment efficiency and M&A decisions. For example, Bo et al. (2016) examine the effect of board attributes on corporate investment using Chinese listed firms, while Jiang et al. (2021) employ executive compensation to examine M&A by Chinese firms. In future, studies could select corporate governance variables to examine the effect of bonding on investment decisions. The thesis also finds that Hong Kong-listed Chinese firms are more likely to use all-cash payments in acquisitions compared with their domestically listed peers. Based on the literature about corporate control and financing in M&A (e.g., Stulz, 1988; Amihud et al., 1990; Faccio and Masulis, 2005), future studies could examine whether there is a connection between control rights and payment methods in takeovers by Chinese firms. Also, the possible influence of Chinese banks on the payment methods used in M&A is worth exploring in future studies.

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Appendix 1

Three examples of P chip selection

The P chip firms are those firms listed on the Stock Exchange of Hong Kong (SEHK) that are not classified as H-shares or Red chips. To identify P chip firms traded on the Main Board of SEHK, the thesis employs two key criteria: first, geographical location of corporate headquarters ─ if a firm is headquartered in mainland China, it is classified as a P chip; second, geographic segments of company's assets and revenues ─ if a firm's revenue (100%) is derived from mainland China or a firm's assets (100%) are located in mainland China, it is classified as a P chip. The data about corporate headquarters and geographic segments were collected from S&P Capital IQ. The screening search function in Capital IQ has only one option, "China (Primary)", that identifies China. After checking the output of the search, "China (Primary)" represents mainland China (i.e., People's Republic of China excluding Hong Kong and Macau). Also, the thesis obtained P chip firms from the "Russell Global Index membership list". If a firm is listed as a P chip in the "Russell Global Index membership list", the firm is also classified as a P chip in the thesis. It is a challenge to identify companies from mainland China, Hong Kong and Taiwan because since 1980s China has attracted a lot of Foreign Direct Investment (FDI) from Hong Kong and Taiwan. Hong Kong or Taiwanese companies usually set up a subsidiary in mainland China (Headquarters in mainland China or Hong Kong). Overall, P chip firms have been confirmed in the thesis by three different methods: Headquarters (289 firms); Assets or Revenue (93 firms); inclusion in the Russell index (58 firms). Three examples are shown to explain how a firm listed on the Stock Exchange of Hong Kong (SEHK) is classified as a P chip:

Example 1 Tingyi (Cayman Islands) Holding Corporation (SEHK: 0322)

Step 1: After checking the information on H-share or Red chip, Tingyi (Cayman Islands) Holding Corporation (SEHK: 0322) is not an H-share or Red chip.

Step 2: After checking the information in the "Russell Global Index membership list", Tingyi (Cayman Islands) Holding Corporation (SEHK: 0322) is not classified as a P chip in the list.

Step 3: Checking the information about the headquarters, Tingyi (Cayman Islands) Holding Corporation (SEHK: 0322) was founded in 1992 and is based in Shanghai, in the People's Republic of China. Thus, it is classified as a P chip for the thesis as the headquarters is located in Shanghai.

Example 2 New World Department Store China Limited (SEHK: 0825)

Step 1: After checking the information on H-share or Red chip, New World Department Store China Limited (SEHK: 0825) is not an H-share or a Red chip.

Step 2: After checking the information in the "Russell Global Index membership list", New World Department Store China Limited (SEHK: 0825) is not classified as a P chip in the list.

Step 3: Checking the information about the headquarters, New World Department Store China Limited (SEHK: 0825) was founded in 1993 and is headquartered in Causeway Bay, Hong Kong.

Step 4: Checking the information about total revenues and total assets, New World Department Store China Limited (SEHK: 0825)'s total revenues (2004-2015) were found to be 100% from mainland China. Thus, it is classified as a P chip. If total revenues did not meet the criterion, then its total assets (2004-2015) would have been checked. The data are only available from 2004 in the database of S&P Capital IQ.

Example 3 MTR Corporation Limited (SEHK:0066)

Step 1: After checking the information on H-share or Red chip, MTR Corporation Limited (SEHK:66) is not an H-share or a Red chip.

Step 2: After checking the information in the "Russell Global Index membership list", MTR Corporation Limited (SEHK:66) is not classified as a P chip in the list.

Step 3: Checking the information about headquarters, MTR Corporation Limited (SEHK:66) was founded in 1975 and is headquartered in Kowloon Bay, Hong Kong.

Step 4: Checking the information about total revenues and total assets, MTR Corporation Limited (SEHK:66)'s total revenues (2001-2015) or total assets (2001-2015) were found not to be 100% from mainland China. Thus, it is not classified as a P chip in the thesis.

Appendix 2

The distribution of the firm sample in different sectors.

Panel A: The distribution of foreign listed firms

Sector	Freq.	Percentage
Aerospace and Defence	2	0.26
Alternative Energy	8	1.04
Automobiles and Parts	28	3.64
Beverages	11	1.43
Chemicals	30	3.9
Construction and Materials	35	4.55
Electricity	16	2.08
Electronic and Electrical Equipment	30	3.9
Fixed Line Telecommunications	2	0.26
Food Producers	37	4.81
Food and Drug Retailers	11	1.43
Forestry and Paper	5	0.65
Gas, Water and Multiutilities	11	1.43
General Industrials	17	2.21
General Retailers	34	4.42
Health Care Equipment and Services	11	1.43
Household Goods and Home Construction	15	1.95
Industrial Engineering	45	5.85
Industrial Metals and Mining	28	3.64
Industrial Transportation	29	3.77
Leisure Goods	15	1.95
Media	13	1.69
Mining	28	3.64
Mobile Telecommunications	4	0.52
Oil Equipment and Services	17	2.21
Oil and Gas Producers	10	1.3
Personal Goods	48	6.24
Pharmaceuticals and Biotechnology	28	3.64
Real Estate Investment and Services	101	13.13
Software and Computer Services	17	2.21
Support Services	19	2.47
Technology Hardware and Equipment	45	5.85
Travel and Leisure	19	2.47
Total	769	100

Panel B: The distribution of domestically listed firms

Sector	Freq.	Percentage
Aerospace and Defence	10	0.66
Alternative Energy	6	0.4
Automobiles and Parts	68	4.5
Beverages	34	2.25
Chemicals	119	7.87
Construction and Materials	83	5.49
Electricity	57	3.77
Electronic and Electrical Equipment	87	5.75
Food Producers	60	3.97
Food and Drug Retailers	9	0.6
Forestry and Paper	20	1.32
Gas, Water and Multiutilities	22	1.46
General Industrials	19	1.26
General Retailers	69	4.56
Health Care Equipment and Services	7	0.46
Household Goods and Home Construction	28	1.85
Industrial Engineering	117	7.74
Industrial Metals and Mining	81	5.36
Industrial Transportation	60	3.97
Leisure Goods	18	1.19
Media	25	1.65
Mining	50	3.31
Mobile Telecommunications	2	0.13
Oil Equipment and Services	5	0.33
Oil and Gas Producers	8	0.53
Personal Goods	60	3.97
Pharmaceuticals and Biotechnology	97	6.42
Real Estate Investment and Services	133	8.8
Software and Computer Services	27	1.79
Support Services	32	2.12
Technology Hardware and Equipment	45	2.98
Travel and Leisure	40	2.65
Unclassified	14	0.93
Total	1,512	100

Appendix 3

Descriptive statistics tables after winsorization for each chapter.

Table 3.9 Descriptive statistics (after winsorization)

This table reports the descriptive statistics of the sample used in the analysis. The sample includes both Hong Kong-listed firms and domestically listed firms from 2001 to 2015. All variables defined in this study are expressed in the Chinese currency (Chinese Yuan Renminbi). *Investment* $_{i,t}$ is measured by capital expenditures (year *t*) over lagged PPE (year *t-1*). *Investment* $_{i,t-1}$ is measured by capital expenditures (year *t-1*) over lagged PPE (year *t-2*). *Tobin's Q* $_{i,t-1}$ represents a firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. The *Cash ratio* $_{i,t-1}$ represents the level of cash and is measured as the ratio of cash and short term investments to total assets. *Leverage* $_{i,t-1}$ is measured as total debt over total assets. *Stock Returns* $_{i,t-1}$ is measured as the change in the yearly return index for firm *i* in year *t-1*. *P/E ratio* $_{i,t-1}$ is computed as the stock price scaled by earnings per share yearly. *Firm size* $_{i,t-1}$ is measured as the logarithm of the total assets for firm *i* in year *t-1*.

Panel A: Hong Kong listing						
VARIABLES	observations	mean	Std. Dev.	min	P50	max
Investment $_{t}$	6321	0.379	0.782	0.000	0.178	5.504
Investment $_{t-1}$	6320	0.391	0.860	0.000	0.178	6.167
Tobin's Q $_{t-1}$	6321	1.614	1.384	0.566	1.194	11.467
Cash ratio $_{t-1}$	6320	0.223	0.166	0.005	0.175	0.683
Leverage $_{t-1}$	6313	0.216	0.175	0.000	0.199	0.778
Stock Return $_{t-1}$	5409	0.148	0.661	-0.674	-0.007	2.868
P/E ratio $_{t-1}$	4597	21.008	45.617	3.400	12.300	996.300
Firm size $_{t-1}$	6321	15.369	1.783	11.693	15.304	19.036
Panel B: Domestic listing						
VARIABLES	observations	mean	Std. Dev.	min	P50	max
Investment $_{t}$	15877	0.283	0.627	0.000	0.133	5.504
Investment $_{t-1}$	15877	0.293	0.685	0.000	0.133	6.167
Tobin's Q $_{t-1}$	15877	2.329	1.729	0.615	1.762	11.467
Cash ratio $_{t-1}$	15872	0.159	0.119	0.005	0.130	0.683
Leverage $_{t-1}$	15877	0.279	0.184	0.000	0.273	0.778
Stock Return $_{t-1}$	15489	0.124	0.601	-0.674	-0.041	2.868
P/E ratio $_{t-1}$	13051	94.308	157.198	3.400	42.800	996.300
Firm size $_{t-1}$	15877	14.800	1.257	11.693	14.719	19.036

Table 4.14 Descriptive statistics (after winsorization)

This table reports the descriptive statistics of the sample used in the analysis. The matched sample includes both Hong Kong-listed firms and domestic listed firms from 2001 to 2015. All variables are expressed in Chinese currency (Chinese Yuan Renminbi). *Bidder* is a dummy variable to identify whether a firm makes a bid. If a firm makes at least one bid in a year, it is equal to one, otherwise it is equal to zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year t minus net sales in year t-1 scaled by net sales in year t-1. *Firm size* is measured as the logarithm of the total assets.

Panel A: Hong Kong listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
Bidder	1084	0.407	0.491	0.000	0.000	1.000
Tobin's Q	1084	1.566	1.153	0.649	1.181	11.447
Free cash flow	1084	-0.029	0.076	-0.304	-0.020	0.138
Leverage	1084	0.248	0.167	0.000	0.252	0.702
Sales growth	1084	0.251	0.612	-0.699	0.153	5.009
Firm size	1084	16.255	1.759	12.174	16.321	19.491
Panel B: Domestic listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
Bidder	2742	0.553	0.497	0.000	1.000	1.000
Tobin's Q	2742	2.291	1.799	0.656	1.693	11.447
Free cash flow	2742	-0.033	0.070	-0.304	-0.023	0.138
Leverage	2742	0.292	0.178	0.000	0.288	0.702
Sales growth	2742	0.268	0.732	-0.699	0.130	5.009
Firm size	2742	15.413	1.316	12.174	15.359	19.491

Table 4.15 Descriptive statistics (after winsorization)

This table reports the descriptive statistics of the sample used in the analysis. The sample includes transactions by Chinese listed firms (Hong Kong-listed and domestically listed) from 2001 to 2015. All variables are expressed in Chinese currency (Chinese Yuan Renminbi). *Complete* is a dummy variable. If a transaction is completed it is equal to one, and otherwise it is equal to zero if a transaction is cancelled. *CAR* is the 5-day cumulative abnormal return during the M&A announcement event days (−2,+2). *Tobin's Q* represents the firm's investment opportunities and is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Free cash flow* is computed as operating income before depreciation minus interest expenses minus income taxes minus capital expenditures, scaled by the book value of total assets. *Leverage* is measured as total debt over total assets. *Sales growth* is measured by net sales in year t minus net sales in year t-1 scaled by net sales in year t-1. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization before the acquisition announcement. *All cash* is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. *Private* is a dummy variable. If the target is a private firm, it is equal to one, otherwise it is equal to zero. *Cross-border* is a dummy variable to identify the cross-border acquisition and it is equal to one if the acquisition is cross-border, otherwise it is equal to zero. *Tender* is equal to one if the transaction is a tender offer, otherwise it is equal to zero.

Panel A: Hong Kong listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
Complete	612	0.887	0.317	0.000	1.000	1.000
CAR	612	0.011	0.080	-0.214	0.007	0.288
Tobin's Q	612	1.599	1.281	0.709	1.129	10.495
Free cash flow	604	-0.030	0.067	-0.274	-0.014	0.124
Leverage	612	0.286	0.149	0.000	0.301	0.700
Sales growth	612	0.318	0.778	-0.669	0.195	6.175
Bidder size	612	16.841	1.790	12.482	17.207	19.714
Transaction value	612	6.880	0.921	3.434	7.167	7.869
Relative deal size	612	0.510	0.246	0.020	0.496	0.999
All cash	612	0.881	0.324	0.000	1.000	1.000
Private	612	0.979	0.144	0.000	1.000	1.000
Cross-border	612	0.230	0.421	0.000	0.000	1.000
Tender	612	0.007	0.081	0.000	0.000	1.000
Panel B: Domestic listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
Complete	1979	0.587	0.493	0.000	1.000	1.000
CAR	1979	0.014	0.083	-0.214	0.003	0.288
Tobin's Q	1979	2.220	1.687	0.755	1.587	10.495
Free cash flow	1891	-0.029	0.065	-0.274	-0.014	0.124
Leverage	1979	0.309	0.174	0.000	0.317	0.700
Sales growth	1979	0.320	0.872	-0.669	0.143	6.175
Bidder size	1979	15.839	1.438	12.482	15.716	19.714
Transaction value	1979	6.840	1.002	3.434	7.161	7.869
Relative deal size	1979	0.518	0.266	0.020	0.501	0.999
All cash	1979	0.884	0.321	0.000	1.000	1.000
Private	1979	0.990	0.100	0.000	1.000	1.000
Cross-border	1979	0.040	0.197	0.000	0.000	1.000
Tender	1979	0.001	0.022	0.000	0.000	1.000

Table 5.15 Descriptive statistics (after winsorization)

This table reports the descriptive statistics of the sample used in the analysis. The sample includes both Hong Kong-listed firms and domestically listed firms from 2001 to 2015. All variables are expressed in Chinese currency (Chinese Yuan Renminbi) when defined in this study. *All cash* is a dummy variable. If an acquirer uses all-cash payment in the transaction, it is equal to one, otherwise it is equal to zero. *Tobin's Q* is computed as the book value of assets minus the book value of equity plus the market value of equity, scaled by the book value of assets. *Cash ratio* is measured as the ratio of cash and short-term investments to total assets. *Leverage* is measured as total debt over total assets. *Bidder size* is measured as the logarithm of the total assets. *Transaction value* is measured as the logarithm of total deal size. *Relative deal size* is computed as transaction value divided by the sum of transaction value plus the bidder's market capitalization one day before the acquisition announcement. *Private* is a dummy variable equal to one if the target is a private firm and otherwise it is equal to zero. *Multi-bidder* is a dummy variable if the acquirer makes more than one deal in a year and otherwise it is equal to zero. *Cross-border* is a dummy variable equal to one if the acquisition is a cross-border deal, and otherwise it is equal to zero.

Panel A: Hong Kong listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
All cash	659	0.880	0.325	0.000	1.000	1.000
Tobin's Q	641	1.582	1.164	0.681	1.197	9.970
Cash ratio	650	0.183	0.120	0.015	0.150	0.590
Leverage	650	0.275	0.147	0.000	0.296	0.690
Bidder size	650	16.800	1.740	12.629	17.108	19.714
Transaction value	659	6.888	0.913	3.584	7.167	7.868
Relative deal size	659	0.536	0.267	0.027	0.508	0.999
Private	659	0.985	0.122	0.000	1.000	1.000
Multi-bidder	659	0.557	0.497	0.000	1.000	1.000
Cross-border	659	0.203	0.403	0.000	0.000	1.000
Panel B: Domestic listing						
VARIABLES	observations	mean	Std. Dev.	min	p50	max
All cash	1388	0.859	0.348	0.000	1.000	1.000
Tobin's Q	1258	2.153	1.613	0.755	1.548	9.970
Cash ratio	1374	0.155	0.101	0.015	0.132	0.590
Leverage	1374	0.307	0.167	0.000	0.315	0.690
Bidder size	1374	16.016	1.528	12.629	15.908	19.714
Transaction value	1388	6.882	0.965	3.584	7.206	7.868
Relative deal size	1388	0.542	0.267	0.027	0.520	0.999
Private	1388	0.986	0.116	0.000	1.000	1.000
Multi-bidder	1388	0.536	0.499	0.000	1.000	1.000
Cross-border	1388	0.039	0.193	0.000	0.000	1.000