**Aalto University
School of Economics**

Cross-listing and valuation differences between the Hong Kong and the Chinese stock markets

Finance

Master's thesis

Marko Berg

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PURPOSE OF THE STUDY
The purpose of this study is to investigate cross-listing and valuation differences between the Chinese and the Hong Kong stock markets. Majority of the cross-listing literature is focused on US and UK stock markets due to the large amount of cross-listings. However, there has been considerable cross-listing activity from China to Hong Kong since the beginning of the 21st century. In addition, the Chinese stock market is relatively young and has many restrictions originating from the socialist history of the country. Therefore the cross-listings from China to Hong Kong offer an interesting framework to study the phenomenon. The main focus of this study is to find out whether cross-listings add and whether their share classes in Hong Kong reach the valuation of Hong Kong peers. In the academic literature related to the cross-listing these issues are called 'cross-listing premium' and 'cross-listing discount', respectively.

DATA AND METHODOLOGY
The data set consists of all the companies listed in the Shanghai Stock Exchange, the Shenzhen Stock Exchange and the Hong Kong Stock Exchange between 2001 and 2010. When the data was retrieved the amounts of companies listed in the exchanges were in total 970, 1419 and 1479. The main focus is on the 164 H-shares. H-shares are stocks of the Chinese companies listed on the Hong Kong Stock Exchange. 70 of those companies have cross-listing; listing in Shanghai/Shenzhen as well as in Hong Kong. Following previous literature, Tobin's Q is utilized to act as a proxy for company valuation. There are four hypotheses constructed based on the previous literature and then hypotheses are tested with OLS regression. The model is controlled with a set of independent variables influencing company valuation. All the data was retrieved from Thomson One Banker and Datastream.

RESULTS
The set of hypotheses are mainly supported by the results. The first hypothesis and the test cover the relative valuation between the Chinese and the Hong Kong stock markets. The Chinese stock markets are found to be more highly valued when compared to the pure Hong Kong companies in the Hong Kong Stock Exchange. The cross-listed H-shares offer a possibility to study the valuation of different share classes of the same companies. Second hypothesis states that the Chinese share class is more expensive and the tests give support for the hypothesis. Interestingly evidence indicates that the same company, with same cash-flow and voting rights, is valued differently within the Chinese and the Hong Kong stock markets. Third hypothesis tests whether cross-listing is value adding in China. The results support the hypothesis. However, when the test covers only large companies the cross-listing premium seems not to exist. Last hypothesis assumes that the H-shares do not reach the valuation of other Hong Kong shares. The tests give support for the hypothesis and there is evidence for the cross-listing discount in China and Hong Kong framework.

KEYWORDS
Cross-listing, Tobin's Q, Chinese stock market, H-shares

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TUTKIELMAN TAVOITTEET
Tämän tutkimuksen tarkoitus on tutkia kaksoislistautumista (cross-listing) sekä suhteellisia arvostuseroja Kiinan ja Hong Kongin osakemarkkinoiden välillä. Suurin osa kaksoislistautumista käsittelevästä akateemisesta kirjallisuudesta keskittyy USA:n sekä Iso-Britannian osakemarkkinoihin, koska siellä kaksoislistautuminen on ollut aktiivisinta. Kuitenkin 2000-luvun alusta lähtien kaksoislistautuminen on ollut aktiivista myös Kiinan ja Hong Kongin välillä. Kiinan osakemarkkinoilla on suhteellisen lyhyt historia sekä lisäksi sijoittamista on rajoitettu huomattavasti verrattuna länsimaiseen malliin. Näistä syistä Kiina ja Hong Kong tarjoavat mielenkiintoisen lähtökohdan tutkia arvostuseroja kahden markkinan välillä. Tutkimuksen pääfokus on selvittää onko kaksoislistautuminen yrityksen arvoa kasvattava tekijä Kiinassa ('cross-listing premium') sekä saavuttavatko kaksoislistautuneet kiinalaisyhtiöt (H-osakkeet) Hong Kongin suhteellisen arvostustason ('cross-listing discount').

LÄHDEAINEISTO JA MENETELMÄT
Tutkimusaineisto sisältää kaikki listautuneet yhtiöt Shanghain, Shenzhenin sekä Hong Kongin pörsseistä aikavälillä 2001-2010. Pääfokus on 164 yhtiön H-osakkeissa, jotka ovat Kiinalaisten yhtiöiden Hong Kongin pörssiin listautuneita osakkeita. Edellä mainituista yhtiöistä 70 on listautunut sekä Shanghain/Shenzhenin pörssiin että Hong Kongin pörssiin, eli yhtiöillä on kaksoislistautuminen. Aiempaa akateemista kirjallisuutta seuraten yhtiön arvostusta mitataan käyttämällä Tobin's Q arvoa. Tutkimuksessa muodostettiin neljä hypoteesia ja näitä hypoteeseja testataan OLS regressiota hyödyntäen. Mallia kontrolloidaan joukolla yhtiöiden arvostukseen vaikuttavia kontrollimuuttujia. Kaikki aineisto on kerätty Thomson One Banker ja Datastream tietopankeista.

TULOKSET
Tutkimuksen tulokset tukevat suurimmilta osin asetettuja hypoteeseja. Ensimmäinen hypoteesi ja siihen liittyvä testi tutkii Kiinan ja Hong Kongin osakemarkkinoiden suhteellista arvostustasoa. Tutkimustulokset tukevat hypoteesia ja antavat viitteitä siitä, että yhtiöt Kiinan osakemarkkinoilla ovat korkeammalle arvostettuja kuin yhtiöt Hong Kongin markkinoilla (jos otetaan huomioon yhtiöt, jotka ovat puhtaasti Hong Kongista). Kaksoislistautuneet osakkeet (H-osakkeet) tarjoavat mahdollisuuden tutkia arvostustasoja saman yhtiön eri osakesarjojen välillä. Toinen hypoteesi olettaa, että kaksoislistautuneiden yhtiöiden Kiinassa listattu osakesarja on korkeammalle arvostettu kuin Hong Kongissa listattu osakesarja. Tulokset tukevat hypoteesia ja niiden varjossa saman yhtiön samat kassavirta sekä äänioikeudet omaavat osakesarjat ovat arvostettu eriarvoisiksi. Kolmas hypoteesi olettaa, että kaksoislistautuminen kasvattaa yhtiön arvoa (cross-listing premium). Testitulokset tukevat hypoteesia vain osittain. Tulokset ovat hypoteesin mukaisia, kun testi kattaa kaikki yhtiöt, mutta tulokset muuttuvat merkityksettömiksi jos tutkimus kattaa vain suuret yhtiöt. Viimeinen hypoteesi olettaa, että kaksoislistautuneet osakkeet eivät saavuta Hong Kongin suhteellista arvostustasoa. Tutkimustulokset tukevat myös neljännen hypoteesin olettamaa.

KEYWORDS
kaksoislistautuminen, Tobin's Q, Kiinan osakemarkkinat, H-osakkeet

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1. INTRODUCTION

1.1 Background and motivation

During 1980's and 1990's the fragmentation of the capital markets motivated managers to consider whether offering shares to foreign investors by cross-listing would enhance the stock value. Cross-listing means having simultaneous listing on two stock exchanges. Especially in US and London capital markets have attracted large amount of cross-listings (and overseas listings in general). Despite the fact that global equity markets are highly integrated and easily accessible for investor, cross-listing and trading cross-listed stocks still remains important.

However, there have also been doubts whether cross-listing still matters and creates value. In 2002 the adoption of Sarbanes-Oxley act made listing to US more costly although there could be additional benefits from better shareholder protection. In addition, since the inception of Euro in 2002 it has been easier to invest Europe-wide which may have diminished some valuation implications of cross-listings. Also in the academic discussion the topic has raised a lot of interest. For instance in the study related to the value of international cross-listings by Gagnon and Karolyi (2010) the researchers conclude: *"Cross-listings continue to be vibrant influencing price discovery, trading, and capital-raising for many companies around the world and thus still represent an important force for the integration of global financial markets."*

When cross-listing is examined by numbers Figure 1 below offers some perspective on the issue. Foreign listings are not necessary cross-listings but they act as a proxy for the amount of cross-listings rather adequately. Figure 1 shows upward trending slope for foreign listings.

Figure 1. Number of foreign listings globally
This figure describes the number of foreign listings globally. Statistics from the year 2000 and before was differently divided and thus the figure indicates the development for the last 10 years. **(World federation of exchanges, 2011)**
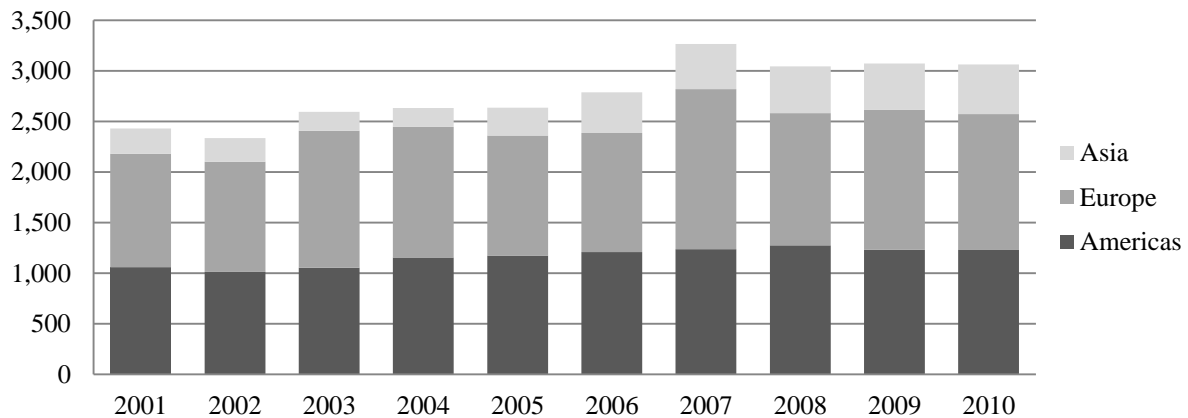
The large number of foreign listings (and thus cross-listings as well) indicates that there are benefits related to it. What is the purpose behind cross-listings? This study gathers a comprehensive list of the arguments. The list of arguments includes, for instance, improved access to larger and deeper pools of capital (see e.g. Doidge et al., 2004), enhanced trading volumes and liquidity (see e.g. Chouinard and D'Souza, 2004), and even better corporate transparency and governance rules to protect the shareholders (see e.g. Reese and Weisbach, 2002). Also arguments from the marketing and competitive perspective are presented (see e.g. Pagano et al., 2002). Academic literature indicates that the potential benefits from cross-listing are associated with the level of economic and financial development and with the regulatory framework of host country (see e.g. Hope et al., 2007). Nevertheless, a lot of the evidence concerning the subject is from US (non-US countries cross-listing to US market). Gagnon and Karolyi (2010) see this as a problem and raise the overcoming of a US-centered perspective on the cross-listing as key challenges regarding the research on international cross-listings.

China and Hong Kong offer an interesting framework for studying cross-listing. A great number of Chinese companies have decided to make their initial public offering (IPO) in Hong Kong. That generates a large enough sample to expand the previous paths of academic literature to cover China. China is an interesting market also because it is well restricted from the eyes of foreign investors as well as from the eyes of local Chinese investors. These restrictions create two-folded problem; it is more difficult for international investor to access the growing equity market in China and it is almost impossible for Chinese investor to invest outside the foreign market. In addition, there are large problems with corporate governance and protection of minority shareholders. These two

issues, market segmentation and corporate governance perspectives, are fundamental reasons for cross-listings. Hong Kong, on the other hand, is ranked first in annual economic freedom index in 2012 conducted by The Heritage Foundation and the Wall Street Journal (2012). The economic freedom index describes Hong Kong as world's most competitive financial and business center. As Chinese two stock exchanges (Shanghai Stock Exchange and Shenzhen Stock Exchange) were opened in 1990's, the history of the Hong Kong Stock Exchange dates back already to 19th century and it was named 'Hong Kong Stock Exchange in 1914. Also the large differences between the Chinese and the Hong Kong stock markets offer good grounds to study cross-listing.

There is some academic discussion on segmented markets and the failure of the law of one price in those markets. There is evidence that price differences exist between companies' shares that are traded in different market segments. One example is the two share classes, one for domestic investors and another for international investors. According to the literature the price premium is largely found on the favor of foreign shares over domestic shares (see e.g. Domowitz et al., 1997). In China there are quite similar settings because the existing B-shares are available for foreign investors as well as the H-shares in Hong Kong. However, in this case the shares offered to investors from Mainland China are trading at premium. The restrictions to invest outside the home market together with the vast number of Chinese investors have created this phenomenon.

International cross-listing has inspired a great deal of academic research over the years and even more in the previous years. Most of the studies focus on either abnormal return around the announcement day and cross-listing date (see e.g. Foerster and Karolyi, 1999 and Bris et al., 2007) or the overall valuation effect of cross-listing (see e.g. Doidge et al., 2004 and Hope et al., 2007). Valuation is usually studied by comparing cross-listed shares with non-cross-listed peers from the home market. Tobin's Q is the conventional way of proxing the valuation in the cross-listing literature (see e.g. Fresard and Salva, 2011 and Doidge et al., 2004). Most of the studies focus on US markets and thus extensive evidence is not available from other markets. Therefore it is justified to argue only that there seems to be considerable valuation effects when cross-listing to US. This valuation effect is designated to 'cross-listing premium'. Some studies state that valuation effect is temporary; some state that it is greater for companies from countries with low shareholder protection. There is at least one study (see Shen et al., 2008) covering the China and Hong Kong framework. That paper indicates as well that cross-listing is value-enhancing. The most significant papers from the field are covered in more detailed in section 3.

This study is inspired by a recent study by Fresard and Salva (2011). They have taken a unique approach to the issue and studied whether companies cross-listing to US have reached the level of US peers. Fresard and Salva (2011) argue that cross-listing does not perfectly integrate company to the target market and there is relatively high (approximately 15%) discount between cross-listed share in the target market and the target market peers. They denote this price difference by 'cross-listing discount'. In other words, they found out that 'cross-listing premium' and 'cross-listing discount' exist simultaneously because cross-listing increases the value compared to the home market but still it does not reach the level of the target market. Nevertheless, these results cannot be generalized outside the US.

1.2 Objectives

This paper aims to study cross-listing in China and Hong Kong framework. The objective is to answer the main research question '*what are the existing valuation differences between the Chinese and the Hong Kong stock markets and what is the role of cross-listing in the relative valuation?*' First, valuation difference between the Chinese and the Hong Kong markets are studied in overall to find out whether it is true that the Chinese stocks are more valuable than Hong Kong's. Second, the valuation effect between China and Hong Kong is investigated further by studying whether the Chinese companies' stocks traded in Hong Kong (H-shares) are valued higher than the cross-listed share class of the same company traded in the Chinese market. Thirdly, the 'cross-listing premium' is studied by comparing the valuation between the Chinese stocks trading in Shanghai/Shenzhen, which have cross-listings and the non-cross-listed peers from the same markets. Fourth, inspired by Fresard and Salva (2011), the 'cross-listing discount' is studied by comparing the valuation of Chinese companies trading at Hong Kong and the Hong Kong peers. The Objectives of this study are presented in more detailed in section 4. Following previous literature this paper employs Tobin's Q and it act as a proxy for valuation. The actual study is conducted by using OLS regression where Tobin's Q is the dependent variable and dummy variable is specified to capture the valuation differences in different cases. This study also includes a range of other control variables to explain valuation and to make the dummy variable more robust.

1.3 Main findings and the contributions to the academic literature

The study by Shen et al. (2008) is the only paper found examining the valuation perspective of cross-listing in the China and Hong Kong framework. The study focuses on the time period of

1994-2003. Because China is one of the fastest developing countries in the world and there have also been dramatic changes in the stock exchange level, studies related to China get outdated faster than in Europe or US context. Therefore it is relevant to say that new evidence with more recent data really contributes in this case. This study contributes to the earlier literature in two different ways. Conducting a comprehensive and current study on valuation effects of cross-listing in China and Hong Kong and it tests the approach of Fresard and Salva (2011) in the Hong Kong markets and the Chinese markets. In addition, this study provides an overview on the current situation of Chinese stock market.

The scope of this study is limited to cover only the Hong Kong and China framework. There are also many Chinese companies listed in the US stock exchanges and they have also bred interesting attention in the current news but they are left outside of the study. Similarly, this study does not investigate the explanations for the inspected valuation differences and only theories and possible explanations are presented but their influence is not further tested. These issues offer interesting grounds for further studies

The main findings of this study suggest that cross-listing premium exist if all the companies (financial companies and companies that have total assets under 30 CNY million are excluded) in China are taken into consideration. However, the cross-listing premium disappears when only larger companies are examined. In addition, there is a cross-listing discount in Hong Kong. This study also provides evidence on the overall valuation differences between China and Hong Kong. Valuation difference in the favor of the Chinese A-shares is found when the Chinese stocks are compared with pure the Hong Kong stocks but not when compared against all the Hong Kong companies (there is at least 400 Chinese companies, in addition to H-shares, listed in Hong Kong). In addition, cross-listed A-shares are found to have significant valuation premium against the same shares (the cross-listed shares) listed and traded on the Hong Kong Stock Exchange (H-shares).

The results give slightly contradictory evidence about cross-listing premium in China. The results suggest that there is a significant valuation effect in favor of the cross-listed shares but the robustness checks (see appendices 2 and 3) do not support that result. At least partly, the robustness checks reveal that this deviation results from the small companies in the sample. In addition, Table 8 shows that there can be a deviation also within the study period. There is a significant cross-listing premium in 2007-2010 but not in 2001-2006. Last hypothesis is set to expect that there is a cross-

listing discount in Hong Kong. Findings of the study support the hypothesis and results are robust based on the three robustness checks conducted. Findings of the study explained in more detailed in sections 6 and 8 where results and conclusions of the study are presented.

1.4 Definitions of the key concepts

In this study the following concepts are explained to make their interpretation clear in the context of this paper.

Cross-listing refers to listing on two or more stock exchanges. In this case it does not make difference whether the first listing is not made to the company's home market. Second offering may or may not include capital-raising. In the context of this paper the two stock listings have to be in different countries (in overall the term can refer to a situation where company is listed in two stock exchanges in the same country). Cross-listing is usually a strategic choice to secondarily list company's shares on a new overseas market (Gagnon and Karolyi, 2010). Cross-listing can be easily mistaken for 'foreign listing'. Foreign listing refers to being listed on some stock exchange other than the home exchange. Cross-listing is also sometimes used as a synonym for dual-listing but dual-listing refers to the case of merged companies maintaining separate listings.

H-shares are shares of the Chinese companies, which are traded in the Hong Kong Stock Exchange. That does not automatically mean that all of them are cross-listed shares because some of the companies have listing only in Hong Kong (foreign listing).

Red Chip Shares are stocks of the Chinese companies incorporated outside China but listed on the Hong Kong Stock Exchange. Red Chip companies also has their main business in Mainland China.

A-Shares are shares traded on Shanghai or Shenzhen stock exchange and accessible only by local Chinese investors and Qualified Foreign Institutional Investors (QFII).

QFII is an abbreviation of Qualified Foreign Institutional Investors. QFIIs are institutions which have applied and granted a permission to own A-shares within agreed quota

B-shares are shares traded in Shanghai and Shenzhen but accessible also for foreign investors. Currently there exists 108 B-shares in total

1.5 Structure of the study

Rest of this paper is organized as follows. Next, section 2 describes the Chinese stock market and thus gives valuable information for the reader to better understand the reasons behind the results. Section 3 introduces the previous literature and theories related to cross-listing and its valuation implications. In section 4 the scope of the research is clarified with research question and hypotheses of the results. Section 5 presents the data and data gathering process as well as the methodology behind the study. Section 6 is dedicated to the results where they are explained and discussed. Section 7 briefly introduces the conducted robustness checks. Section 8 concludes the study by summarizing the main points as well as suggesting further research issues which have been raised in the process of this study.

2. BACKGROUND INFORMATION ABOUT THE CHINESE STOCK MARKETS

The Chinese stock market is still relatively young - Shanghai Stock Exchange was opened in December 1990. In addition to its short history, the stock market is relatively undeveloped and there are many restrictions originating from the central planned communist economy and unconceivable growth in China. To understand the grounds and reasons for this study it is important to know a little bit about the history of the Chinese stock markets as well as something about the current situation. In the next section, history and the current restrictions of the market will be clarified briefly. Also corporate governance from China's point of view will be discussed. Although the background section is descriptive the issues are tied to the academic literature related to the subject.

2.1 The history of the Chinese stock markets

Both Chinese stock exchanges have comparable short history. Shanghai Stock Exchange (SHSE) was opened in December 1990 and a year later Shenzhen Stock Exchange (SZSE) was opened. China is still quite closed economy although it is moving towards more open economy. In the early days of Chinese stock markets the listed companies could offer only shares that were available for the local Chinese investors - A-shares. Growing magnitude of China and international interest towards it as well as the need for more equity sources set the path for introduction of B-shares. B-shares is an another stock class that was introduced to international investors and later on made available to local Chinese as well. B-shares listed in SHSE are denominated in US dollars and the ones listed in SZSE are denominated in Hong Kong dollars. (Chen et al., 2008).

In the early 1992, Deng Xiaoping (the Chinese leader at that time) held the Grand Tour of South China where he gave several ground breaking speeches. Among the speeches Mr. Xiaoping suggested that stock markets were not necessarily a capitalist institution. These words set a path for listings of state owned entities (SOEs) and higher importance of the stock exchange. (Tomasic and Fu, 2005). After that also international investors expressed their interest towards Chinese stocks in great extent (Sun et al., 2008). That together with Chinese interest in reforming the efficiency of the SOEs could have been the keys for government allowing or even favoring overseas listings of the Chinese companies. Although B-shares offered a way for foreign investors to enter the market, already in July 13th 1993 the first company, Qing-Dao Beer Corporation, cross-listed to the Hong Kong Stock Exchange (HKSE). This was the beginning of H-shares. H-shares belong to the

companies incorporated in China but listed in HKSE. Quickly B-shares started to lose their significance.

To survive in the international competition there has been a *SOE reform* to increase the efficiency of SOEs since 1979. Few months after the listing of Qing-Dao Beer Corporation to the Hong Kong Stock Exchange, the Chinese government made regulation for overseas listings: *"A Special Regulation on Raising Capital and Listing Overseas by a Joint-Stock Company"*. Originally the planned target to list SOEs was New York Stock Exchange. Nevertheless, currently Hong Kong is the primary target for SOE listings although there are some Chinese companies listed in New York as well as in Singapore (N-Shares in New York and S-shares in Singapore). In most of the stock issuance from China to Hong Kong the government maintains their position as direct or indirect primary shareholder. (Sun et al., 2008).

2.2 Restrictions in the Chinese stock markets

In the Chinese stock markets there are many restrictions which distort the market. The main restriction is the prohibition of Chinese investors to invest outside China (outside A- and B-shares) and foreigners to invest in A-shares. These restrictions create two-folded problem since it influences both Chinese domestic investors as well as the international investors. A problem from the foreign investors' point of view is that they lack the access to the highly growing market in its full extent. Only a fraction of the firms can be invested in through B- or H-shares. When considering the issue from Chinese investors' perspective, their whole equity investment universe is limited to A-shares. This limited supply of investment possibilities has driven up the prices of A-shares. One could argue that the problem is much more severe from the Chinese point of view. (Huo, 2011).

However, outside investors have not been completely blocked from the Chinese market. Foreign investors that have the status of *Qualified Foreign Institutional Investors* (QFII) are allowed to invest in A-shares. The Chinese government established the QFII framework in December 2002 to attract long-term investors. Which investors can achieve the status of QFII is strictly regulated and the process to acquire the status is highly bureaucratic. The process to apply for the status is currently open for funds, insurance companies, securities firms, commercial banks and some other institutional investors groups. Briefly described, institutions applying the status have to, first, demonstrate credibility, capability and commitment and, second, apply for investment quota.

Typical quota is between US$100-200 million and it has to be invested in A-share within six months of approval, or the application is rescinded. The Chinese authorities are also controlling the amount of QFII by hastening or delaying the application process. The process can last from nine months up to two years. (MCF Global Investment Management, 2010). Currently the total quota for all QFIIs is still limited to US$30 billion in total (Wan, 2009). Large international institutional investors have acquired the QFII status and in August 2011 there were 115 QFII licenses approved. The list of QFIIs includes for example UBS, Nomura, Goldman Sachs, Government of Singapore Investment Corp, Yale University and Royal Bank of Canada. (China Stock Venture, 2011).

In The Chinese stock market short selling had been completely restricted until 2010. In 2010 China Securities Regulatory Commission (CSRC) started a trial period for margin trading, short selling and introduced an index future. The trial period have still different kinds of restrictions and the date for continues allowance of short selling and margin trading is unknown. (Wall Street Pit, 2010).

Trading index futures will make it easier for larger investors to take a stand without the fear of large market impact and it will also allow easier short selling. However, for now restrictions in trading index future have kept larger institutional investors off the market. There are position limits and bureaucratic problems before institutions can begin trading. The small number of institutions in the equity index market is seen in the Figure 2 below. However, in mid-2011 China has issued guidelines to allow QFIIs to start trading equity index futures. It is possible that it will boost the market and make it more efficient. (Huo, 2011).

Figure 2. Composition of market participants–comparison between China and US/Europe (2010)
This figure describes how trading in China is divided by institutional and retail trading. **(Huo, 2011)**
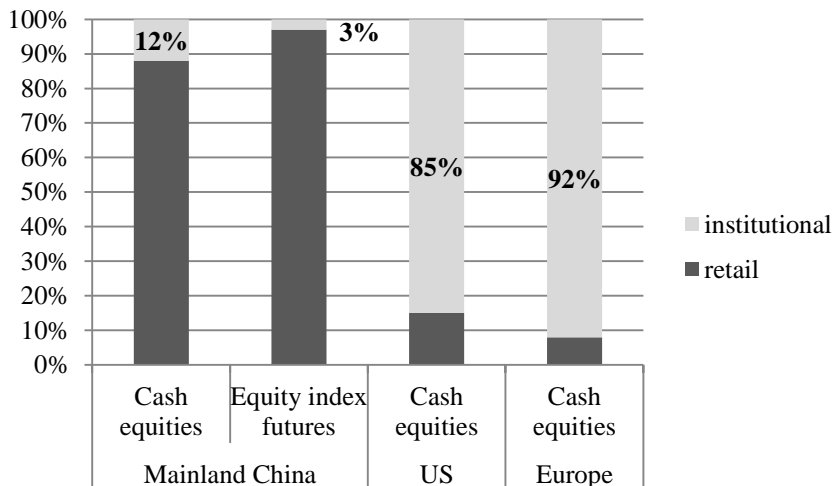
Figure 2 gives a clear overview of the Chinese stock market (Mainland China excluding Hong Kong). The stock market is largely dominated by retail investors compared to developed markets in US and Europe. The high relative amount of retail investors has made the stock market highly speculative and thus volatile. Although international institutional investors under QFII status are allowed to invest in A-shares their investments are regulated and restricted by quotas. Their share in the Chinese securities markets is less than 1% from the total market capitalization (MCF Global Investment Management, 2010).

The Chinese stock market is dominated by SOEs or companies emerged from former SOEs. Although SOEs decide to list on stock exchange, the government tends to maintain the position as the largest shareholder. That effectively diminishes the free float. The Chinese stocks have been divided into three classes of shares by law; shares owned by state (state shares), shares owned by legal entities (legal shares) and ordinary shares owned by private and institutional investors (ordinary shares). All the classes hold same cash flows and voting rights but legal and state shares are not completely tradable in stock exchanges. Only ordinary shares have traditionally been tradable. On average only one third of the shares are ordinary, which represent the free float. This has increased the illiquidity and thus volatility. (Firth et al., 2006).

Large portion of stocks being non-tradable and, moreover, the fact that government is the largest shareholder of the non-tradable shares have created problems. Non-tradable shares have not incentivized development of the companies and still large shareholders and managers have been able to discriminate minor shareholders by diverting cash flows from the company. Large amount of non-tradable shares have also locked the management positions. In 2005, China Securities Regulatory Commission (CSRC) launched a new reform program to convert non-tradable shares to tradable after the failure of previous reform program. It took over a year to get all the companies in the program because of the mere size of the legal and state shares outstanding. It will still take considerable time to complete the program and the process is ongoing in 2011 because non-tradable sharess are released to trading in parts. The government is afraid of the market reaction on sudden supply of shares. (Chen et al., 2011a).

Chinese stock market is in a strong boom phase and there are more companies wanting to list their shares than CSRC considers optimal. In the beginning of 2000 there was still IPO quota in China to regulate how many companies could go public in a year. The policy was changed in 2001 and more responsibility was given to the investment banks facilitating the issues. However, the final amount

of companies listed in specific year is regulated by CSRC. That has also paved a way for increasing the amount on listings to the Hong Kong market as well as the acquisitions of the listed companies. These both present a way to avoid the IPO quota. (Chen et al., 2011b).

Table 1. Statistics from the Hong Kong and the Chinese stock exchanges (2010 end figures)
This table describes the key figures of Shanghai, Shenzhen and the Hong Kong stock exchanges. B-shares are excluded from the Shanghai's and Shenzhen's figures (there are 54 B-shares in both exchanges currently). All the figures are in millions of US dollars and they describe the situation at the end of 2010. Data is gathered from the statistics of World federation of Exchanges (2011) and Ernst&Young's report of global IPO trends (2011).

	Shanghai	**Shenzhen**	**Hong Kong**
Number of companies	894	1,169	1,413
Market capitalization (millions of USD)	2,716,470.2	1,311,370.1	2,711,316.2
Value of share trading (millions of USD)	4,486,484.4	3,563,792.0	1,496,215.2
Capital raised in 2010 (millions of USD)	27,879.0	44,295.0	57,383.0
IPOs in 2010	24	339	94

Figure 3. Development in Hong Kong, Shanghai and Shenzhen stock exchanges
This figure describes the development of Hong Kong, Shanghai and Shenzhen stock exchanges. Left axis is the amount of companies listed and right axis denotes the market capitalization in millions of US dollars. All the values, except 2011, are derived from year-end figures. 2011 values are only covering the beginning of the year until September. (World Federation of Exchanges, 2011)
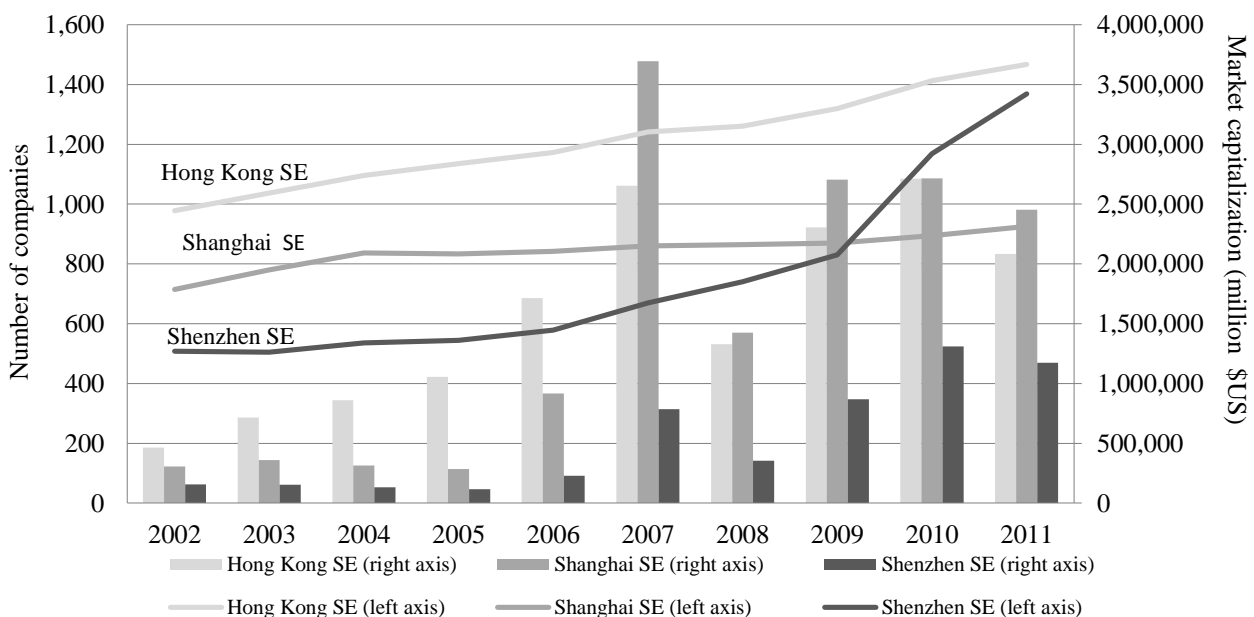
However, the number of listed companies does not reflect the size of the companies and thus the importance of the stock market for the economy (Pistor and Xu, 2005). Figure 3 and Table 1 describe the Chinese and Hong Kong Stock stock exchanges. When different figures of HKSE, SHSE and SZSE are examined separately the figures can give an inconsistent view. In the end of 2006 HKSE was larger than SHSE and SZSE combined in terms of market cap. However, during

2007 SHSE and SZSE market cap grew rapidly and although a recent financial crisis can clearly be seen in the values, HKSE could not maintain its position. In terms of companies listed, Shenzhen has grown rapidly over the past few years but the IPOs have been mainly smaller companies and thus the market cap in total has remained lower than in SHSE or in HKSE. Value of the share trading offers some perspective of the liquidity of the stock exchanges but, according to Allen et al. (2005), high figures (at least in Shenzhen) may also indicate highly speculative market and not highly developed one. In 2010 Hong Kong was the exchange that raised most capital in the world. Shenzhen was the second best and Shanghai was at the fourth place. Greater China (China, Hong Kong and Taiwan) dominated the global statistics of IPOs (36.5% of global total) and total capital raised (46.3% of global total) in 2010. (Ernst&Young, 2011).

The listed restrictions in the Chinese markets bring forth an interesting issue: stocks in China are far more expensive than in Hong Kong. This phenomenon is widely recognized in the academic literature as well (see e.g. Lee et al., 2007, Sun et al., 2008 and Peng et al., 2007). The pricing differences are present most clearly when comparing the Chinese stocks that are listed on Hong Kong with same voting and cash flow rights. Seah et al. (2005) highlight two main issues behind the gap between the A- and H-share valuation; limited investment opportunities for local retail and institutional investors and limited supply of tradable A-shares. This reasoning refers to the fact that the Chinese stock market is highly segmented. The capital market segmentation theory is discussed in more detailed in section 3.1.2.

Hang Seng Bank has comprised an index to track the difference between A- and H-shares valuation; Hang Seng AH Premium index (see Figure 4 below). The index calculates the premium for each pair of stocks and then takes a weighted average based on market capitalization of all the premiums. When the index value is above 100, A-shares are trading at a premium (and vice versa).

Figure 4. Hang Seng China AH Premium Index from inception to September 2011
This figure shows the development of Hang Seng AH Premium Index. The index describes the stock valuation difference between the Chinese companies which have cross-listing in Hong Kong and the same companies listed in Shanghai/Shenzhen stock exchange. The index includes the largest and most liquid 48 companies that have A-shares and H-shares available. In other words, there are 48 H-shares and 48 A-shares of which 42 are listed in Shanghai and 6 in Shenzhen. (Hang Seng Indexes Company Limited, 2011)
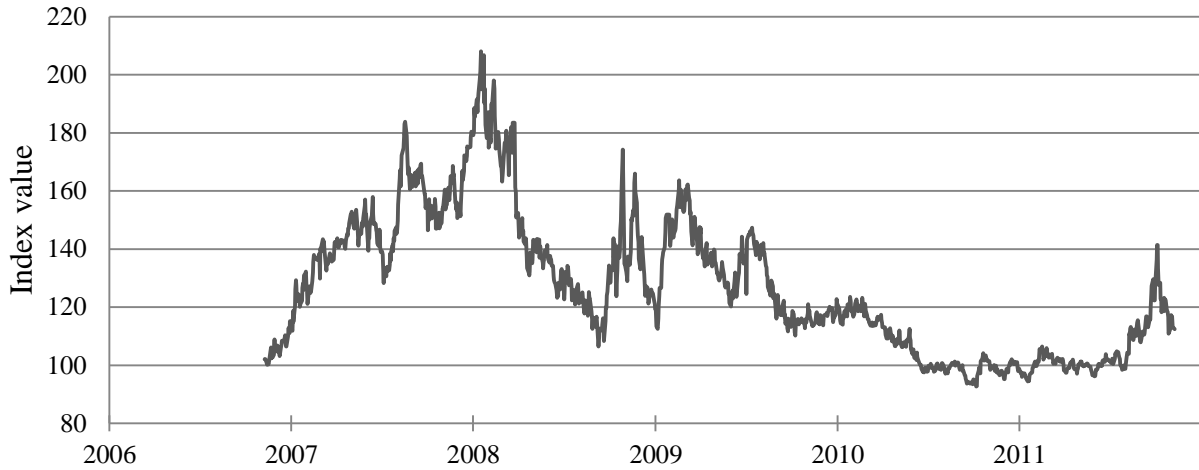
There is an alternative explanation for the valuation difference denoted by Hang Seng AH Premium Index. Lee (2009) studies the valuation difference from the liquidity perspective utilizing intraday data. Researcher states that A-shares offer better liquidity than the counterparts from Hong Kong (H-shares) in terms of bid-ask spread and market depth. However, Lee (2009) also notes that H-shares are highly liquid yet not as liquid as A-shares.

Despite the fact that Hong Kong is a part of China as a Special Administrative Region, it is much more open and driven by different mindset than Mainland China. The country ranking of economic freedom 2012 conducted by The Heritage Foundation and the Wall Street Journal describes the differences between China and Hong Kong. In the index, Hong Kong is placed at number one and described as follows:

> *"Hong Kong has demonstrated a high degree of resilience during the ongoing global turmoil and remains one of the world's most competitive financial and business centers. The high-quality legal framework, which provides effective protection of property rights and strong support for the rule of law, continues to be the cornerstone of strength for the dynamic city economy. There is little tolerance for corruption. Regulatory efficiency and openness to global commerce strongly support entrepreneurial dynamism, while overall macroeconomic stability minimizes uncertainty."*

China, on the other hand, is ranked at 138th from (from 179) and described as follows:

> *"Economic freedom in China rests on fragile foundations. The judicial system is vulnerable to political influence and Communist Party directives, and corruption is perceived as widespread. The party's small leadership group holds ultimate authority, and direct control is exercised over many aspects of economic activity. The pace of genuinely liberalizing economic reform has slowed or stopped. The government has tried to counter the slowdown in global demand with expansionary fiscal and monetary interventions. The embrace of market principles that could enhance efficiency and long-term competitiveness has become sporadic and is unevenly distributed throughout the country. The absence of political will to undertake more fundamental restructuring of the domestic economy has led to overreliance on public investment and exports to promote growth. The state-controlled financial sector continues to undercut efficiency and productivity through extensive use of subsidies and credit controls."*

Ranking is done by scoring (scale 0-100, 100 being the best) ten different aspects (China's and Hong Kong's scores in parentheses respectively); *business freedom* (46.4 – 98.9), *trade freedom* (71.6 – 90.0), *fiscal freedom* (70.4 – 93.1), *government spending* (84.1 – 91.1), *monetary freedom* (74.2 – 85.8), *investment freedom* (25.0 – 90.0), *financial freedom* (30.0 – 90.0), *property rights* (20.0 – 90.0), *freedom from corruption* (35.0 – 84.0) *and labor freedom* (55.4 – 86.5). As one can notice China lacks institutions in investing, ownership and avoiding corruption. Also Chinese total score have decreased from the last year (last year was 135th), which does not imply progression towards free markets. (The Heritage Foundation and The Wall Street Journal, 2012).

When Chinese firms list on the Hong Kong Stock Exchange they have to start obeying more stringent requirements than they would in Shanghai or Shenzhen. Also the active international investors in Hong Kong's market require larger degree of transparency and companies are under continues monitoring of more demanding analyst community. The legal system in Hong Kong is based on the English common law that is highly driven by market factors and is therefore in the favor of international investors. Nevertheless, the Chinese companies prefer listing to HKSE. Whether this is because of the more stringent listing requirements or despite them, is questionable in terms of international cross-listing literature. In the literature review section the theories and reasoning behind cross-listing is discussed in the light of academic literature.

2.3 Corporate governance in China

Corporate governance was an "unknown" word in China a decade ago and currently there have been clear steps to increase its relevance. The awareness emerged after "China's Enron case", Ying Guang Xia accounting fraud revealed in 2002. Significant changes were made in 2004 (came effective in 2006) to Securities Law of the People's Republic of China and to Company Law of People's Republic of China. In addition, the year 2005 was named as the Year of Corporate Governance. (Tsui, 2010).

"The core of corporate governance is to protect the interests of investors and to prevent investors' capital being pillaged by managers" (Jian et al., 2011). OECD (2005) defines corporate governance as follows: *"Procedures and processes according to which an organization is directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among the different participants in the organization – such as the board, managers, shareholders and other stakeholders – and lays down the rules and procedures for decision-making."*

There is a two-tiered control system in China regarding the monitoring of a company: there is the board of directors (BOD) and the board of supervisors (BOS). BOD is responsible for the shareholders and decides important company issues (same way as in the Western corporate system). BOS, on the other hand, monitors company's directors and they have the power to demand corrections to actions that may have injured or will injure the company. In addition, Chinese corporations have to hire independent directors. There is a set of laws and articles covering the specifications about independent directors and their duties and independency as such. The tasks of independent directors are similar to the other members' of the board of directors but, moreover, they are required to protect the interest of minority shareholders without the influence of major shareholders. (Tsui, 2010). Clarke (2006) argues that there were hopes that independent directors would have taken the monitoring role, which BOS failed to take.

Although a lot has been done on the legal side towards better corporate governance, there are still deeply rooted problems in China's corporate scene and the problems originate from the history of the country. The majority of the Chinese stock market consists of SOEs, and they used to have CEOs appointed and supervised by the state and there were no boards of directors. Still due to these historical ties many CEOs are politically connected and majority of the listed firms are directly or

indirectly controlled by the state. Fan et al. (2007) report that over 25% of the CEOs are currently or have been government officers. Although many of the SOEs are already listed, they are bound by large ownership of the state. Before 1998 an individual investor could not hold more than 0.5% of total shares outstanding from the listed firms. China's past as a socialist society and the government's dual position of being the owner of the companies and the one controlling and judging has made the enforcement of the laws very ineffective. Although the laws may seem adequate, they are redundant if the enforcement is lacking. (Yang et al., 2011). Chen (2003) presents interesting examples how the inefficiencies in law enforcement is shown explicitly; in the beginning of 2000 Chinese court system refused the hearing of securities law suits against publicly listed companies.

According to Tsui (2010) the Chinese framework for corporate governance satisfy the minimum goals when the system is compared with the OECD's six principles of corporate governance. The problem lies more in the practical factors that stem mainly from the China's history, as discussed above. As the state is the main owner of most of the companies the juridical system is reluctant to enforce laws and impose punishment in the fear of negative company performance and thus potential loss of state assets. Allen et al. (2005) also state that China does not have an independent juridical system. Enforcement inside the companies is also lacking, as BOS has no true power to take actions against managers. In addition, there is no mentioning about the consequences that BOS could implement on directors if there is some misbehavior or when directors refuse to cooperate. Management usually appoints BOS with the mandate from shareholders and, in addition, independent directors as an institute is not that effective in China. Their duty is more or less decorative as the positions can be filled with inexperienced candidates. There is a law that allows shareholders with more than 1% of the shares to nominate independent directors. Nonetheless, if a company does not have a cumulative voting system (voters are allowed to concentrate their votes on a single candidate) it is most likely that large shareholders can dominate the nomination voting. (Tsui, 2010). Although independency is problematic in China, the problem of CEOs having a position in the board of directors is not that significant. At the end of 2009, in 88.9% of the listed companies in China CEOs did not hold any position in the board of directors (Yang et al., 2011).

The factors discussed above consisted of the internal governance issues. Takeover market, bank finance and legal infrastructure act as external governance vehicles and have been found efficient at least in Western countries. In China the takeover market may not act that efficiently as an external corporate governance vehicle. This is mainly due to the share structure of listed companies and the

fact that in the past companies could not acquire another company without the approval of the state. Liu and Sun (2005) found out that 81.6% of the companies were ultimately owned by the state (9% directly and 72.6 indirectly through pyramid stock holdings) at the end of 2001. Non-tradable shares reform has decreased the state ownership and Yang et al. (2011) report that slightly more than 50% of the companies were ultimately controlled by the state at the end of 2009. Although the situation has improved, it is difficult to consider that the takeover market could act as a governance vehicle as it is in the Western countries. Cai et al. (2007) provide evidence that share reform has provided significant positive abnormal return for stockholders.

Bank finance still dominates the credit market within Chinese corporations and the four big state-owned banks dominate the bank market (Yang et al., 2011). There is only a small amount of literature regarding the relationship between bank financing and corporate governance in China. Tian and Estrin (2007) suggest that banks, especially government owned banks, would not provide good corporate governance because the state-owned banks are willing to sacrifice the financial interest over social and political interests. Allen et al. (2005) describe the banking system in China as relatively undeveloped and they are worried about the amount of nonperforming loans granted to SOEs.

There are some studies about the effectiveness of corporate governance in China and its implications to corporate performance. Governance mechanisms that have found to be effective in developed countries have had questionable influence in China. Allen et al. (2005) studied Chinese law-finance-growth nexus. They separate three corporate sectors of the Chinese economy: (1) state sector, (2) listed sector and (3) private sector (companies where ownership is divided between private sector and local government or is entirely owned by the private sector). Authors conclude that private sector companies have been growing much faster than the other sectors. In addition, according to them the imbalance between the sectors can be explained with alternative financing channels and corporate governance mechanisms, which are based on reputation and relationships and thus support the growth of the private sector. Chen et al. (2009) studied how the ownership is related to corporate performance. They divide companies by ownership into four categories: (1) central government, (2) state asset management, (3) local government and (4) private (private ownership does not imply of disperse ownership). According to their study, the median of the largest shareholder's holding was 42% and the second largest shareholder's holding was just 5% (at the end of 2004). Chen et al. (2009) criticize earlier studies that they have failed to organize the state ownership into different categories since different owners have different objectives and

incentives. Companies owned and controlled by central government were found to be the best performing and the private ownership was found to indicate worst performance. The paper argues that private ownership decreases the agency problems as ownership and management are quite well aligned. However, because private ownership does not imply dispersed ownership, larger shareholders can expropriate wealth from the company and thus harm the holders of minority interest. It is said that the risk is higher in private companies because they are not monitored by the state. One possible weakness of the study is left without concern; state can mitigate the problems of the large state owned companies and thus make the business more protected for them.

Executive compensation is also studied in the Chinese framework. Conyon and He (2011) mention that the level of executive pay is lower in state-controlled firms. The paper also finds positive connection between independent directors and pay-for-performance as well as independent directors (in non-state companies) and being able to replace the CEO for poor performance. Chi and Zhang (2009) findings suggest that executive compensation is more sensitive to sales growth in cross-listed firms than pure mainland firms. However, Hong Kong firms' executive compensation is still more sensitive to the stock returns than cross-listed firms'.

Chen et al. (2008) and Jian et al. (2011) have examined the cross-listing and the influence of better corporate governance in corporate performance. Both studies conclude that there is a connection between cross-listing, corporate governance and corporate performance. However, when the results are scrutinized more carefully, corporate governance factors are not that significant in the regressions. Both of the studies use simple proxies for corporate governance such as stock holding concentration and board characteristics. Bai et al. (2004) and Li and Niu (2009) have studied corporate governance and its relation to valuation in China. Both of the studies suggest that there is a corporate governance premium that must be paid for company with better corporate governance.

3. LITERATURE REVIEW

This part will summarize the academic literature in the field of cross-listing. Because cross-listing is covered in the literature quite extensively, the focus is on the value implications of cross-listing and the possible theories explaining those implications. First in section 3.1, theoretical and empirical base for cross-listings are described in detailed. The discussion is divided into four sections. First subject is the quite controversial legal bonding theory. Second, a summary of the theories explaining the increase in shareholder base is developed. Third section goes through liquidity and information asymmetries related theories, and fourth section gathers other theories and reasons based on empirical evidence.

After discussing the theories, the second section (3.2) is devoted to the stock market implications of cross-listing based on academic literature. First, the literature related to abnormal returns around cross-listing is briefly summarized. Thereafter the valuation differences between cross-listed companies and different peer groups are discussed. These two sections (3.1 and 3.2) are highly interrelated as the second section can be seen as evidence to the theories and reasoning behind cross-listing.

3.1 Theoretical and empirical reasoning behind valuation implication of cross-listing

In this theoretical discussion of cross-listing the grounds of an efficient market are discussed first. If markets were perfectly efficient the cross-listings would be redundant; investors would be indifferent about where to invest and companies would be indifferent where to list their stocks because there would not be any investment barriers or home bias. In addition, all investor would have all the information and markets would be perfectly liquid etc. In reality there are all kinds of deviations from the perfect markets and it also allows some valuation implications regarding the cross-listings. There are number of theories which effectively explain the valuation implications and they are discussed next. The theory section will mainly follow the comprehensive paper by Dodd (2011) and its description of theoretical reasoning for value implications of cross-listing. Many of the academic papers related to the topic (see e.g. Sarkissian and Schill, 2009[1], Bris et al., 2007 and Doidge et al., 2004) list similar kind of theories to support the cross-listing reasoning, but Dodd (2011) provides more theories and more extensive background information regarding the theories.

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[1] Sarkissian and Schill (2009) cover foreign listings and do not require subsequent or earlier listing in other exchange (cross-listing)

Dodd (2011) lists the following theories*: the capital market segmentation theory, the information asymmetries theory, the legal bonding theory, the liquidity theory, the signaling theory, the investor recognition theory, the proximity preference theory, the market timing theory* and *the business strategy theory* (see Table 2 for summary of the theories).

In order to make this paper a more comprehensive study, also valuation differences between the Chinese and the Hong Kong markets are studied in overall context. Some of the theories presented by Dodd (2011) can also explain the overall price differences between markets. Chakravarty et al. (1998), La Porta et al. (2002), Lee et al. (2007) and Domowitz et al. (1997) argue that the capital markets segmentation theory, the information asymmetries theory, the legal bonding theory and the liquidity theory can explain the equity price differences although the cash flow and voting rights of the assets would be similar.

3.1.1   Legal bonding and signaling theory

Coffee (1998) and Stulz (1999) began the discussion about the possible market value implications related to cross-listing to a legal environment which provides better protection for minority shareholders – **the *legal bonding theory***. If the target exchange has more stringent disclosure requirements than the home market, the "bonding" can effectively limit the use of private benefits by controlling shareholders. La Porta et al. (2002) found out that countries with poor investor protection systems have low financing activity. In the framework of this study the legal bonding theory covers legal protection, requirements of accounting standards, monitoring from financial intermediaries and securities laws and securities market regulations covering the disclosure requirements for example. In addition, this bonding hypothesis includes also reputational intermediaries such as underwriters, analysts, auditors and debt rating agencies, which effectively increase transparency. Jian et al. (2011) suggest that if corporate governance is improved the interests of the investors will be guaranteed and Modigliani & Miller traditional corporate value will be increased. Consequently the stock price and returns will also be increased. In section 3.2, most of the evidence support bonding theory. Nevertheless, also controversial opinions exist within academics. Closely related to bonding theory, *the signaling theory* suggests that cross-listing is a way for managers to convey information about firm's future prospects and quality (Dodd, 2011).

Hail and Leuz (2003) study whether country's legal institutions and securities regulation is systematically related to the international differences in the cost of equity capital. Their study

concludes that better legal institutions and securities regulation transform into lower cost of capital. They highlight the effect of institutions which mandates the disclosure of information and thus enables investors privately enforce their contracts. However, Hail and Leuz (2003) also found out that as markets gradually become more integrated the risks become more globally priced and the effect of one country's legal institutions and securities regulations magnitude becomes smaller.

Doidge et al. (2004) support the benefits of bonding hypothesis. They notice that companies listing from emerging markets usually have highly concentrated ownership which can lead to expropriation of minority shareholders. Cross-listing (US evidence) increases the disclosure and thus makes it more difficult for major shareholder to expropriate cash flows. In addition, authors suggest that increased monitoring should decrease the cost of debt. Also the empirical evidence of studies by Reese and Weisbach (2002), Doidge et al. (2004) and Benosa and Weisbach (2004) suggest that there is a clear relation between cross-listing and achieving better minority shareholder protection. Reese and Weisbach (2002) offer more grounds on studying the bonding hypothesis by taking into account the level of shareholder protection in both the target and the host countries. Companies from countries with good shareholder protection tend to make subsequent equity issues in the cross-listing destination. Companies from countries with poor shareholder protection tend to only "loan" the status by cross-listing and then conducting the subsequent equity issues in home country.

There is also literature against the bonding hypothesis. Licht (2003) merely argues that *the avoiding hypothesis* would be more appropriate. The author raises agency theory suggesting that managers actively seek for their own benefit. Thus, if managers choose to seek more stringent disclosure requirements by cross-listing they effectively diminish their private benefits. Also Doidge et al. (2009) found out in their study that when major shareholders have high private benefits it will diminish the willingness to cross-list. As further evidence for the argument, Licht (2003) lists aggregated reasons for cross-listings to US*: "(1) business reasons (facilitating an acquisition, business expansion, publicity for products, prestige, visibility); (2) financial reasons (better price, liquidity, size of transaction, status); (3) industry specific reasons (listing of competitors, opinions of analysts); and (4) expansion of US shareholder base."* In addition to the fact that more stringent legal framework is not in the list, disclosure requirements were found as the major obstacle in practically all of the studies (Licht, 2003). In addition, Licht (2003) suggests that avoiding hypothesis should lead to stock exchanges adopting less stringent disclosure requirements. Coffee (2002) discusses the stock market competition as an impact of cross-listing. He suggests that companies prefer more stringent corporate governance and it is likely that there will be competition

which stock exchange can offer the best framework for good corporate governance – racing towards the top. Avoiding hypothesis could lead to similar kind of behavior but in that case there would be a race for the bottom.

Siegel (2005) questions the bonding hypothesis as well but for different reasons. Based on his evidence, US authorities are reluctant to force laws on cross-listed foreign companies (Evidence from Mexican companies). That is why he separates legal bonding from reputational bonding and suggests that the latter explains better the success of cross-listings.

When looking at the bonding hypothesis from the perspective of Chinese firms, one could easily argue that cross-listing to Hong Kong could lead to better corporate governance standards. The Chinese government has emphasized the strategic role of overseas listings in the process of establishing *"a modern corporate system"* and bringing the Chinese firms up to the international norms (Sun et al., 2008). This statement suggests that the bonding hypothesis could be one of the primary motives for listing of H-shares. Doige et al. (2009) suggest that companies with highly concentrated ownership (high private benefits) are less likely to do cross-listing to US. This refers to high standard exchanges and thus could also apply to HKSE. Thus evidence would certainly fit the Chinese companies as well but since cross-listing decisions come from central government it leaves less leeway for bureaucrats to exploit private benefits.

In the sample used by Sun et al. (2008) most of the H-share companies had their IPO in Hong Kong and after that were listed to the Chinese home market. That could indicate many things such as an urgent need for higher amount of capital which cannot be raised from the Chinese market. It could also indicate preference to attract international investors or that company wanted to increase the level of corporate governance and possible gain some reputational benefit from being listed on an exchange meeting the international standards. The corporate governance argument would also fit into the evidence suggested by Reese and Weisbach (2002) since IPO in Hong Kong tend to follow a listing to the Chinese home market. Reese and Weisbach (2002) suggest that companies from countries with poor shareholder protection make the subsequent equity offering in home market after cross-listing. Chen et al. (2008) and Jian et al. (2011) have studied the relation between cross-listing and corporate governance in China. Both of the studies have concluded that cross-listing improves the corporate governance of a company. In addition, both studies argue that better corporate governance leads to better operational performance (however, results are not highly significant).

3.1.2   The capital market segmentation theory and related theories

Assuming that there are at least some obstacles in investing internationally. In that case cross-listing could improve the available of stocks for investors that previously had high barriers to invest. When a market is perfectly segmented investors are completely restricted from that market. Barriers to invest may also emerge from taxes, transaction costs, foreign exchange controls, information availability etc. **The c***apital market segmentation theory* suggests that when the investor base increases due to cross-listing, risks are shared more widely which eventually lead to lower risk and lower cost of capital (Foerster and Karolyi, 1999). Stapleton and Subrahmanyam (1977) presented already in 1977 that cross-listing could be a way to effectively reduce market segmentation. Sarkissian and Schill (2009) suggest that according to the theory (ceteris paribus) we should see the highest gains in terms of decrease in cost of capital when firms decide to list on exchanges where asset returns are least correlated with the home market. Although investing has become less restricted after the Internet, still the concept of home equity bias would suggest that investor tend to favor companies that are familiar and easily accessible (home exchange) (King and Segal, 2003).

The investor recognition theory is highly related to the result of capital market segmentation theory; as shareholder base increase, risks are shared which decrease cost of capital and thus leads to higher share price. The only difference is that the investor recognition theory suggests that firm can acquire large shareholder base by marketing, public relations and cross-listing to another stock exchange which increases the visibility of the firm. Merton (1987) introduced a model of capital market equilibrium with incomplete information. The model was not tied to efficient market theory where firm specific risk could be eliminated via diversification. Merton's model assumed that investors are not aware of all the existing stocks and thus diversification is not complete. This is why investor recognition theory suggest that if investor base is widened the risk can be diversified more efficiently.

Related to the capital market segmentation theory and the investor recognition theory, Sarkissian and Schill (2004) provide evidence about "home bias" in cross-listings and present *the* **p***roximity preference theory.* The theory suggests that investors and corporate decision makers are biased towards similarity in terms of geography, economy, culture and industry. Sarkissian and Schill (2004) use cross-border exports and geographical distance to show that the wealth effects of cross-

listing are the highest between two similar companies[2]. Interestingly, the investor recognition theory and the proximity preference theory suggest contrary. Cross-listing to a market that lowers the investing barriers the most would presumably be the one that is not near the home market and is also in other ways different.

3.1.3 The improved liquidity and the information asymmetry theories

Cross-listing can lower the cost of capital through additional liquidity and by making the price discovery better due to the easier access to the information. Amihud and Mendelson (1986) state that greater liquidity should turn into lower cost of capital since shareholders value liquidity (***the liquidity theory***). Better liquidity means that transactions can be executed easier and with less impact on the share price. One of the measures of liquidity is bid-ask spread. Chouinard and D'Souza (2004) (empirical evidence from Canada) show that following a cross-listing, bid-ask spread narrowed also in the home market. The study also suggests that liquidity in the home market can decrease if cross-listing directs informative traders away (also noted by Licht, 2003). Lee (2009) explains the price difference between A-shares and H-shares by liquidity factors derived from intraday stock price data and thus verifies the liquidity theory.

In imperfect capital markets, information asymmetry can influence the asset prices. According to ***the information asymmetry theory*** market segmentation based on the access to information can be decreased by cross-listing. Increasing media coverage and increasing the amount of analyst follow-up allow investors to have more and better information and thus it will lead to more efficient price discovery. Lower cost (on informational perspective) to follow-up the company could also lead to larger investor base and higher demand for the stock (Chouinard and D'Souza, 2004).

3.1.4 Other theories and empirical explanations to cross-listing

Both Sarkissian and Schill (2009) and Gozzi et al. (2008) suggest that valuation gains achieved by cross-listing are temporary. This evidence could suggest that corporate managers time the market. ***The market timing theory*** suggests that cross-listings are conducted when there is a strong stock market performance in the home market and, similarly, during a hot period in the target market.

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[2] Sarkissian and Schill (2004) cover foreign listings and do not require subsequent or earlier listing in other exchange (cross-listing).

The business strategy theory concentrates more on competition perspective of the cross-listing and the theory suggests that reasons for cross-listing are more related to corporates' strategic choices. Pagano et al. (2002) report that companies tend to list their shares on the same exchanges where their industry peers are listed. For example, US stock markets have attracted a lot of high-tech and export-oriented companies in the past.

Tolmunen and Torstila (2005) argue that cross-listing could be seen as a vehicle for facilitating international acquisitions because target shareholders are likely to prefer payment in domestic equity. The study focuses on European firms cross-listed to US. The results show that cross-listed companies are significantly more active in acquiring US companies than their non-cross-listed peers. In addition, cross-listed peers use equity payment in larger extent.

Cross-listing, especially for emerging market companies listing to more developed stock exchanges, offers the benefit of more liquid market where to raise equity. For growth companies the possibility to tap into more efficient capital markets, can have their growth opportunities valued at their potential (Doidge et al., 2004). Jian et al. (2011) states that the most important reason for the Chinese companies to cross-list is the financing needs and describes the financial needs as a bottleneck for the development of Chinese firms domestically. The Chinese companies cross-listing on Hong Kong are large in terms of total assets and the IPOs are far larger in terms of proceeds. The study of Guo et al. (2010) concentrates on Chinese non-cross-listed and cross-listed firms between 1993-2008 (between SZSE/SHSE and HKSE). During that period average IPO proceeds for cross-listed company (in HKSE) was 6.15 CNY billion compared to the non-cross-listed (in SZSE or SHSE) average of 0.38 CNY billion. Sun et al. (2008) address the question why Chinese firms list overseas. In China, the stock prices are much higher than in HKSE and that will eventually lead to the fact that the cost of capital is higher in Hong Kong but still the Chinese companies are cross-listing to HKSE.

Sun et al. (2008) offers two possible explanations for cross-listings to HKSE – *governance hypothesis* and *"market order" hypothesis.* The governance hypothesis are similar to the bonding discussed in previous part. The "market order" hypothesis refers to the possibility that Government of China considers the IPOs of SEOs to be too large for the Chinese local stock exchanges. When the market depth is relatively low, then additional supply of stocks through large SEO IPOs could depress the market as a whole. This would suggest that the rush to HKSE would decline after SHSE

and SZSE have developed more. The IPO quota system which has been in place in SHSE and SZSE supports the "market order" argument.

Table 2. Summary of the theories presented by Dodd (2011)
Theories that could explain stock market valuation differences are presented in section 3.1. The list of theories strongly leans of Dodd (2011) but presents several supporting academic papers. The below table presents all the mentioned theories, brief explanation and raises some papers which deals with the theory. This table acts as a summary for the presented theories.

Theory	Explation	Previous academic literature
The legal bonding theory	By cross-listing company can effectively bond to the target market's stricter legal environment	Dodd (2011); La Porta et al. (2002); Coffee (1998); Stulz (1999); Doidge et al. (2004); Licht (2003)
The signaling theory	Managers convey infomation about the firm's future prospects and quality	Dodd (2011)
the capital market segmentation theory	Cross-listing can lead to wider investor base and thus risks are shared more wildly and it will eventually lead to lower risk and lower cost of capital	Dodd (2011); Stapleton and Subrahmanyam (1977); Foerster and Karolyi (1999)
The information asymmetry theory	Information asymmetry influences the price discovery and cross-listing can mitigate the asymmetries	Dodd (2011); Chouinard and D'Souza, 2004
The liquidity theory	Liquidity is appreacited by investors because transaction can be executed easier and with less impact on the share price. Thus better liquidity means lower risk on that perspective	Dodd (2011); Amihud and Mendelson (1986); Chouinard and D'Souza (2004); Lee (2009)
The investor recognition theory	When share is more wildly recognized it could lead to wider investor base and thus risks are shared more wildly and it will eventually lead to lower risk and lower cost of capital	Dodd (2011); Merton (1987)
The proximity preference theory	Investors and corporate decision makers are biased towards similarity in terms of geography, economy, culture and industry.	Dodd (2011); Sarkissian and Schill (2004)
The market timing theory	The market timing theory would suggest that corporate managers conduct listings during the hot periods in stock markets	Dodd (2011); Sarkissian and Schill (2009); Gozzi et al. (2008)
The business strategy theory	Cross-listing could be part of the company's globalization strategy offering e.g. visibility and possible easier comparison with peers. In addition it could be related to the need for raise equity	Dodd (2011); Pagano et al. (2002); Jian et al. (2011)

3.2 Valuation implication of cross-listing

There are several papers studying the stock price implications of cross-listing. First, the studies focused on the abnormal return around cross-listing. Later on researchers took cross-listed companies under scrutiny to test whether the abnormal return declines over time or whether it is persistent. Quite many studies have also focused on the relative valuation between cross-listed and non-cross-listed peers to demonstrate different benefits of cross-listing. Fresard and Salva (2011) took a different point of view by exploring the relative valuation between cross-listed company and

the peers in the target country. This was done to examine whether companies reach the valuation level of the target market. Below sections will briefly go through the main findings of the studies related to the value implication of cross-listing. Most of the studies have tried to somehow demonstrate the benefits of cross-listing through valuation and thus the next and the previous parts are highly interconnected.

3.2.1 Abnormal return around cross-listing announcement and actual listing

Foerster and Karolyi (1999) study cross-listings to US during 1976-1992 and conclude that there is significant abnormal return of 19% in the year before listing and additional 1.2% during the listing week. However, they also notice that there is a significant decline of 14% during the year following the listing. They explain these results by leaning on the market segmentation and indirect investment barriers in investing as well as by obtaining a larger shareholder base and greater liquidity. According to the theories related to the value implications of cross-listing, it is possible that those factors lead to a lower risk premium and therefore higher price.

Roosenboom and Van Dijk (2009) compare the stock price reaction of cross-listing in different exchanges to study whether the target market matters. The study focuses on the following exchanges*: NYSE, Nasdaq, Amsterdam Stock Exchange, Brussels Stock Exchange, Paris Stock Exchange* (the stock exchanges of Amsterdam, Brussels, and Paris merged to *Euronext* in 2000)*, London Stock Exchange, Frankfurt Stock Exchange* and *Tokyo Stock Exchange*. The study is comprehensive including 526 cross-listings from 44 different countries during 1982-2002. After controlling country-specific and firm-specific factors the results suggest that the target market does matter. The highest announcement effect is for US exchanges, 1.3% on average, 1.1% for London stock exchange and 0.6% for continental Europe's stock exchanges. The abnormal return around cross-listing announcement in Tokyo was insignificant based on the study by Roosenboom and Van Dijk (2009). Four theoretical explanations were tested to explain the abnormal return: *the market segmentation, increased market liquidity, improved information disclosure,* and *better investor protection (''bonding'')*. In the study the market segmentation and investor protection theories were found significant in explaining the abnormal return.

More recent studies have focused on the abnormal return after years of cross-listing. Sarkissian and Schill (2009) and Gozzi et al. (2008) both suggest that valuation gains derived from cross-listing are temporary. Studies conclude that immediate positive effect is short lived and vanishes in medium

term. Cross-listing tend to lead to an increase in valuation before and during the year of cross-listing but after that the valuation declines. However, Cetorelli and Peristiani (2010) argue differently. They have taken into account the origin of cross-listing company and the cross-listing destination. The focus is on the prestige level of the exchanges. A combination of the information of IPO volumes and the network effect of cross-listings between exchanges acts as a proxy for the prestige level of stock exchange. Researchers conclude that companies cross-listing on more prestige stock exchange compared to their home market will enjoy significant valuation gains over a five year period. The opposite occurs when a company lists on a less prestige stock exchange. Also supportive for the results, companies benefit in terms of future valuation if the prestige level of the target market rises.

The comprehensive study by Dodd (2011) shows results supporting the fact that cross-listing is, on average, value increasing corporate decision. In particular, cumulative abnormal return (CAR) in 21-day period around cross-listing announcement is, on average, 1.8%. When results are analyzed between target markets, cross-listing to US market clearly yields the highest CAR of 3.3% followed by UK with 2.7%. The CAR of cross-listing announcement in Europe is insignificant based on the results. These results hold, even when controlling the introduction of Euro. In overall, these results are in line with the hypotheses conducted by Dodd (2011). Because US market is superior based on economic development, market size, liquidity and analyst coverage, it would bring the highest valuation gains, based on the hypothesis. However, departing from the expectations, Dodd (2011) finds that UK has higher level of disclosure and investor protection than US. This evidence is based on the combination of accounting index, anti-director rights index and rule-of-law index. The European area is, on average, worse in all of these areas of scrutiny. These results could support the legal bonding theory and the liquidity theory. But when cross-listings to UK and US markets are studied more carefully the legal bonding theory loses its significance. Dodd (2011) shows that cross-listings to London's *Alternative Investment Market* (AIM) (list made especially for small growth companies where the listing requirements are less stringent) produce 8.4% CAR around announcement and 10.3% around actual listing. CAR of cross-listings to London's main markets are insignificant. These results are counter intuitive when considering the legal bonding theory and also against hypothesis of Dodd (2011). The higher CAR in AIM is explained by the size of the companies. Company size is negatively correlated with CAR around cross-listings which denote that small companies experience higher CAR. In the sample the average company value of cross-listings to AIM was £17 million while it was £844 million in the main market.

Dodd (2011) concludes that valuation implications of cross-listing vary greatly between companies and also change significantly over time. Large changes in capital market environment, such as introduction of Euro and Sarbanes-Oxley (SOX) have had an impact on the abnormal returns of cross-listing. Adding to arguments against legal bonding, the introduction of (SOX) act in 2002 negatively affects the gains arising from cross-listing in the US sample. This result, although it yields improvements to shareholder protection, could be explained by higher indirect and direct cost of cross-listing. Large companies cross-listing from weaker shareholder host countries still experience positive returns after SOX, which could support the cost explanation.

Dodd (2011) tries to explain the abnormal return effect by the theories stated (discussed earlier in this paper). There are some evidence found to support the market segmentation theory, the legal bonding theory (only in US before the introduction of SOX), the investor recognition theory, the proximity preference theory and the business strategy theory. Nevertheless, only some theories apply to some markets and, all in all, the models with the controlling variables (regarding the theories) have quite low R-squared value (ranging from 0.12-0.21). Also results are highly dependent on which factors act as a proxy for different theories.

3.2.2   *Relative value between cross-listed and non-cross-listed companies*

Most of the studies deal with cross-listings to US but there are also some papers from the Chinese/Hong Kong markets. Tobin's Q is the dominant method in the literature to indicate the valuation of the company (see e.g. Kristian-Hope et al., 2007, Shen et al., 2010 and Cetorelli and Peristiani, 2010). There are slight differences in the way how Tobin's Q can be calculated. This study follows the one used by Fresard and Salva (2011) where in the nominator there are total assets minus value of equity plus market value of equity and in the denominator the total assets. Next, the results of the papers studying the relative valuation are being discussed.

Doidge et al. (2004) report on average 16.5% higher Tobin's Q for cross-listed companies compared to non-cross-listed in a study conducted in US. In US there are different levels of stock listings (starting from the least restricted): *Rule 144a, OTC listing, American Depositary Receipt (ADR)* and *conventional stock listing*. Rule 144a is a least restricted option to allow shares to be traded in US. Rule 114a is only applied for large amounts of stocks traded between qualified institutions. When securities sales are conducted under rule 144a institutions can avoid restrictions

that are set to protect small investors. Nasdaq has electronic trading platform for 144A securities called PORTAL. Evidence of the study shows that cross-listing premium is higher for more "prestige" levels of stock listings (lowest for the Rule 144a and highest for conventional stock listing) because the different levels of listing have different levels of regulation. Many of the studies concentrating on relative value between cross-listed and non-cross-listed companies connect the valuation premium to bonding hypothesis. Doidge et al. (2004) interpret their evidence as supportive to bonding hypothesis. In some of the studies the premium is called *the bonding premium* (see e.g. Fresard and Salva, 2011).

The study by Hope et al. (2007) continues the work of Doidge et al. (2004) by studying the different levels of US listings in relation to cross-listings. There have been arguments that companies from the lower investor protection countries would be more likely to cross-list to take advantage of the increased regulation. Hope et al. (2007) suggest that this is not completely true because companies from lower investor protection countries prefer to list on OTC market or under the Rule 144a. What is really meaningful in the light of earlier research and bonding hypothesis is that companies in the OTC market and under the Rule 144a do not need to comply with US GAAP (Generally Accepted Accounting Principles) and thus their regulation on behalf of US authorities is less strict. These findings have also valuation implication as Tobin's Q is higher for companies listing to organized exchanges. Costs of listing could be one possible reason why companies from lower investor protection regime decide not to list on conventional exchanges. One part of the costs can be the decline of larger shareholders' private benefits and yet another reason can be the financial burden to comply with increased regulation. These costs are relatively higher for companies listing from low investor protection regime and thus it is possible that costs out-weight the benefits of actual listing. These results argue against the bonding hypothesis when it comes to companies that would gain most of the increased shareholder protection. Cumming et al. (2011) give other possible explanations for the result why companies from better shareholder protection regime gain better valuation. First, cross-listing is also done to signal quality and thus the signal of quality is more credible from better shareholder protection countries. In addition, strong governance regimes are more similar to US and thus home equity bias is not that efficient on those companies. Despite cross-listing, companies from low governance regime are still exposed to sovereign risks.

Chen et al. (2008) and Jian et al. (2011) study the corporate governance and cross-listings in SHSE/SZSE and HKSE framework. Both of the papers conclude that cross-listed firms have better

corporate governance and, in addition, they both suggest that better corporate governance will lead to better operational performance. Shen et al. (2008) tie these results to valuation by comparing Tobin's Q of cross-listed companies' A-shares and same the companies' H-shares. As a result they conclude that H-shares enjoy premium. These results could imply that better shareholder protection is valued with a premium.

3.2.3   Relative value between cross-listed company and host country peers

There is quite an extensive research made on cross-listing and the valuation implications of the cross-listing compared to companies from the same home market. Nevertheless, there seems to be only two papers studying whether companies reach the relative valuation of the target market. King and Segal (2003) study relative valuation of US companies compared to Canadian companies cross-listed to US. Based on the evidence, cross-listings proved to increase valuation but still cross-listed firm could not reach the relative valuation of US companies. In that study corporate governance was argued to be the reason for cross-listing premium between cross-listed Canadian companies and their home market peers. Home equity bias was argued to be the reasons for the cross-listing discount between cross-listed Canadian companies and US peers.

Fresard and Salva (2011) use Tobin's Q to measure the relative valuation and compare Tobin's Q of cross-listed companies to the sample of original US companies. This study allows the analyzing of how well cross-listed companies integrate to the US markets and studying which companies actually benefit from US listing. If there were no notable valuation difference, it would suggest a perfect integration. With extensive sample (by study period and host countries) Fresard and Salva (2011) show that there is around 14% cross-listing discount. In other words, this indicates that valuation increases due to cross-listing but still the share class in cross-listing target market remains on average 14% short compared to the US companies. Earlier literature has noted that valuation implication differs significantly between different levels of cross-listings (Rule 144a, OTC, ADR and conventional listing). However, in this study only the cross-listings to major US exchanges (AMEX, NASDAQ and NYSE) were qualified to the sample.

When the results of the study by Fresard and Salva (2011) are examined in a country-level, even higher discount is found to apply for companies from countries with lower shareholder protection. Nevertheless, even though the country of origin would have more developed stock market, there still is an existing discount compared to the US peers. Although the stock markets have been rapidly

integrating globally, the discount is persistent also in a year-by-year analysis. During the study period of 1989-2006 there were only two years that suggested cross-listing premium. However, the results from those years are not statistically significant. Following earlier literature, Fresard and Salva (2011) connect these results to bonding hypothesis but take a step further with the reasoning. By controlling with governance attributes (the used government index is based on 41 attributes from board, audit, anti-takeover, compensation and ownership) the researchers can conclude that approximately half of the discount is related to the lower governance quality. This would suggest that US have significantly better corporate governance and the bonding by cross-listing is incomplete. This suggestion is supported by the result that companies from countries with low shareholder protection experience higher discount.

According to Fresard and Salva (2011), cross-listing discount is also explained by different variables which act as proxies for familiarity. By familiarity Fresard and Salva (2011) mean familiarity to US investors, similar kind of cultural roots, colonial ties and similar kind of economy. Familiarity is shown in country-level analysis as India, Ireland, New Zealand and UK exhibit cross-listing premium over US peers (India, Ireland, New Zealand have very few observations). Companies can increase their familiarity in the eyes of investors by marketing and it is stated in the paper that cross-listing discount decrease significantly when company uses large amounts of money to marketing. Home equity bias is largely linked with familiarity used in this study. This is one of the possible explanation which Fresard and Salva (2011) state to explain the cross-listing discount. Overall the study indicates that cross-listing is not the absolute way to escape the weakness of their home-country.

4. HYPOTHESES AND RESEARCH QUESTIONS

This section presents the research question and the main hypotheses of this study (see Figure 5 for graphical description of the hypotheses). This paper deals with the relative valuation differences between the Hong Kong and the Chinese stock markets and studies the influence of cross-listing in those valuation differences. From the previous literature, study follows mainly the paper by Fresard and Salva (2011). As the main research subject this paper addresses the following question:

Research question: *What are the existing valuation differences between the Chinese and the Hong Kong stock markets and what is the role of cross-listing in the relative valuation?*

The Hong Kong H-share market and the Chinese A-share market and their relationship has been studied in several papers from different aspects. Guo et al. (2010) and Sun et al. (2008) studied the phenomenon itself: why the Chinese companies cross-list their shares to Hong Kong. To explain the issue Sun et al. (2008) offer bonding and "market order" arguments. Same stocks have also been studied from corporate governance and corporate performance perspectives to find out the reasoning behind cross-listing (see Chen et al., 2008 and Jian et al., 2011). Also valuation implications between the Chinese and the Hong Kong markets have been studied from different perspectives. For instance, Peng et al. (2007) and Lee (2009) study the stock market valuation differences attempting to explain them. Shen et al. (2008) follows the international cross-listing literature and study the relative valuation difference between the two markets with Tobin's Q. Shen et al. (2008) also tie the results to corporate governance by declaring that since the evidence suggest that cross-listed companies are more valuable it is evidence of the legal bonding theory. In the international cross-listing literature numerous papers have studied valuation implications with Tobin's Q. Recently, Fresard and Salva (2011) studied cross-listing from a new perspective. They calculate the valuation difference between cross-listed company and target market peers in the US. Also this paper employs Tobin's Q as a valuation measurement.

To address the research question, this paper combines previous studies regarding the relative valuation between the Chinese and the Hong Kong markets. To form a comprehensive representation of the valuation differences, the approaches of Shen et al. (2008) and Fresard and Salva (2011) are followed and, in addition, the overall valuation differences between the markets are studied. Below the hypotheses of this study are conducted to represent the four focus areas of

this study. The methods employed are explained in more detailed in section 5 and the results are presented in section 6.

If a country has specially designated shares for foreign investors they tend to trade at a premium compared to the shares offered to domestic investors (Domowitz et al., 1997 and Chakravarty et al., 1998). These kinds of price differences are explained by the capital market segmentation theory, the information asymmetry theory and the liquidity theory. It is considered that investment restrictions lead to a lower liquidity and less demand due to the fact that the pool of investors is closed and smaller than the "foreign investors" as a whole. Domowitz et al. (1997) studied Mexican markets and state the following: *"These results provide additional support for previous findings that investment restrictions can have significant economic impacts on security prices".* Intuitively this kind of scenario could apply in China as well. However, in reality the situation is completely opposite and the shares for domestic investors are relatively more expensive in China. This could be explained by the fact that since the mass of investors in China is relatively large and as they are able to invest only in their domestic markets, that will drive the prices relatively higher. The foreign investors (in the Chinese perspective) have wider investment possibilities available and therefore their capitals do not pile up. Based on the capital market segmentation theory and on the previous empirical evidence, the following hypothesis is presented.

Hypothesis 1: The Chinese stock markets (both SHSE and SZSE) are relatively more expensive than the Hong Kong stock market.

First, the relative valuation of the Chinese market will be studied by comparing the stock valuations in HKSE and in SHSE/SZSE. From the HKSE the H-shares will be excluded. This is done to obtain a pure valuation difference. To check whether SHSE or SZSE have different valuation, they will be studied separately as well.

The Chinese stock market tends to be more valuable than the Hong Kong market for the reasons presented earlier. When the Chinese companies cross-list to Hong Kong (H-shares), the cash flow and voting rights remain same. Nevertheless, the Hang Seng AH Premium Index (presented earlier in figure 4) has shown that those companies' A-shares trade at a premium compared to the same companies' H-shares. This premium could be explained by theories such as the liquidity theory, the

capital market segmentation theory and the information asymmetry theory. Table 1 presented that the Chinese market is more liquid than the Hong Kong market. This could imply that also A-shares which have cross-listing in Hong Kong are more liquid in China. Because the Chinese market is closed, foreign investors preferring to invest into China need to do it through Hong Kong, for example. Information asymmetry could play a role here because difficulties can arise due to the language differences, different accounting standards and the lack of reliable information regarding the firms and the economy (Chakravarty et al., 1998). The capital market segmentation theory could be argued from the same grounds as presented above concerning the hypothesis 1. Based on the mentioned theories and evidences, above hypothesis is presented.

Hypothesis 2: H-shares of the Chinese companies traded in HKSE are relatively worth less than the same companies share class trading in SHSE/SZSE.

The Chinese companies which have cross-listed on the Hong Kong Stock Exchange might have already earlier made a listing on Shanghai or Shenzhen stock exchange or they could have done it after the cross-listing. The Chinese companies' stocks listed on Hong Kong are share class called H-shares. The interesting phenomenon is that the same company can have two share classes (H-shares and A-shares) which are, otherwise similar but they are listed on different exchanges and they trade at relatively different value. The relative valuation of H-shares in Hong Kong and same companies' A-shares traded in SHSE/SZSE will be studied. This study will reflect the price difference denoted in the Hang Seng AH Premium Index. However, diverging from the AH premium index, all the cross-listed H-shares are included in the sample (except companies operating in financial industries). Mainly based on the capital market segmentation theory, the liquidity theory, the information asymmetry theory as well as the previous empirical evidence, above hypothesis is presented.

Hypothesis 3: The A-shares of the Chinese companies which have cross-listed to Hong Kong have relatively higher valuation than non-cross-listed A-share peers.

To study the valuation implications of cross-listing further, the valuation differences between cross-listed and non-cross-listed shares will be studied. The previous academic literature about cross-listings has suggested that there exist 'cross-listing premium'. Companies which conduct a cross-listing achieve an increase in valuation. This issue is studied in the Chinese and the Hong Kong

framework by comparing the valuation of non-cross-listed Chinese A-shares and the A-shares which have cross-listing through H-shares. Above hypothesis is expected to hold in between cross-listed and non-cross-listed A-shares.

In section 3.1 the theories that could explain and justify the valuation differences between the stocks are presented. The reasons that could intuitively explain the valuation differences are, for instance, widening shareholder base and better corporate governance. As mentioned earlier, the Chinese government has shown interest in increasing corporate governance. That would support the legal bonding theory. The Chinese government has also incentives to improve the efficiency of SOEs by making them more international. That could support the business strategy theory. Making stocks available for international investors can widen the shareholder base, which would be expected by the capital market segmentation theory as well as the investor recognition theory. Also the signaling theory could explain the valuation differences. Following the previous literature (Shen et al., 2008 and Fresard and Salva, 2011) and the theories presented it can be expected that cross-listing is value-adding. Thus the A-shares of the companies which have cross-listed would have relatively higher valuation than non-cross-listed A-shares.

Fresard and Salva (2011) discovered that US-originated companies are more highly valued than the cross-listed foreign companies – 'cross-listing discount'. Authors attempt to explain this difference by studying the determinants of cross-listing "discount". They state that approximately half of the discount can be attributed to corporate governance. In addition, the host country corporate governance standards are analyzed and the results suggest that companies from the poor shareholder protection countries actually experience larger cross-listing discount. This indicates that the corporate governance is significantly better in the US and the bonding is not complete in cross-listing. Authors denote also that familiarity has an important role (supported by extensive literature about home bias). Firms that are more familiar to US investors have valuation closer to US-originated companies. One could assume that also language has an impact and actually there is evidence that cross-listed UK companies have higher valuation than US-originated companies. Fresard and Salva (2011) also show that cross-listing discount widens after years which could indicate the market timing theory.

Hypothesis 4: H-shares of the cross-listed companies have relatively lower valuation than other Hong Kong peers.

Following Fresard and Salva (2011) the valuation difference between cross-listed H-shares and non-cross-listed Hong Kong peers will be studied. As the previous hypothesis 3 focused on cross-listed and non-cross-listed Chinese stocks, the hypothesis 4 concentrates solely on the Hong Kong Stock Exchange. The focus is own H-shares, shares of Chinese companies listed on Hong Kong, and other shares of the Hong Kong Stock Exchange. Although it is expected that Chinese stocks trade at a premium compared to Hong, hypothesis 4 expects that the H-shares trade at a discount compared to Hong Kong peers. This argument is mainly established on *the legal bonding theory* and on the results by Fresard and Salva (2011).

Figure 5. Graphical presentation of the hypotheses

The figure summarizes the samples used when each hypothesis is tested. The hypotheses are listed below the figure. 'HK' refers to the Hong Kong Stock Exchange and 'China' to both Shanghai and Shenzhen stock exchanges. Arrows point at the certain sample set employed. Dashed line denotes the exchange where the company is listed. For example, the second hypothesis (denoted as H2) studies the companies listed in both exchanges and the sample consists of A- and H-shares of those companies. The sample of the third hypothesis consists of regular A-shares and A-shares which also have H-shares traded in Hong Kong (cross-listing).
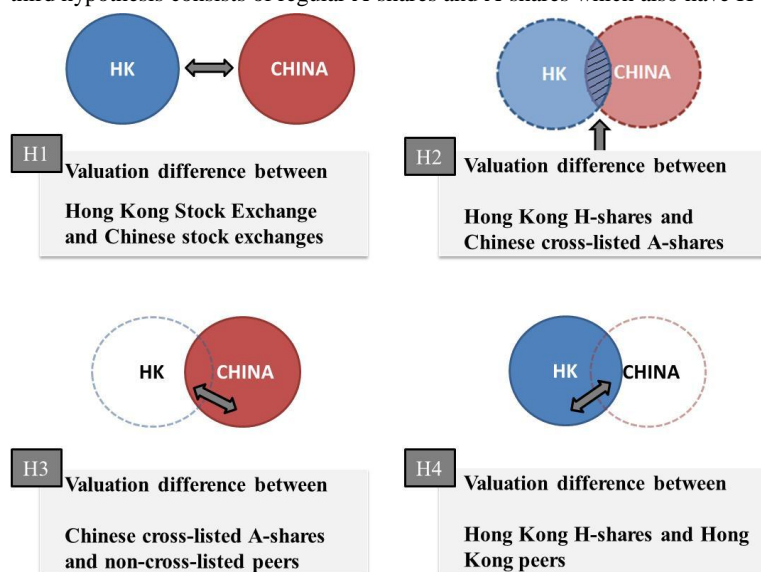
Hypothesis 1 The Chinese stock markets (both SHSE and SZSE) are relatively more expensive than the Hong Kong stock market

Hypothesis 2: H-shares of the Chinese companies traded in HKSE are relatively worth less than the same companies share class trading in SHSE/SZSE

Hypothesis 3: The A-shares of the Chinese companies which have cross-listed to Hong Kong have relatively higher valuation than non-cross-listed A-share peers

Hypothesis 4: H-shares of the cross-listed companies have relatively lower valuation than other Hong Kong peers

5. DATA AND METHODOLOGY

This section presents the key issues related to the data and the data gathering process as well as the methodology employed. All the data is retrieved from Thomson One Banker (later on Thomson) and Datastream databases.

5.1 Data and data gathering process

Due to the fact that this study includes only two markets (three stock exchanges) it was possible to initially start with all the listed companies from HKSE, SHSE and SZSE. Companies were identified through Thomson database using company tickers. The original sample size was 1479 companies from HKSE, 970 companies from SHSE (including 54 B-shares) and 1 419 companies (including 54 B-shares) from SZSE.

For the study purposes it was essential to identify the Chinese companies from HKSE list. First, a list of H-shares was retrieved from the web pages of Hong Kong Stock Exchange (2011) and 164 companies were identified (H-shares). Those companies are by definition Chinese companies and also one of the primary focus groups. From the H-shares, 70 were identified to have a listing also on Shanghai or Shenzhen. These are the companies which are cross-listed. From these 70 companies 13 are from Shenzhen and 57 from Shanghai Stock Exchange. In addition to H-shares, there are other Chinese companies listed on the HKSE. In this study there are two different 'country' specification functions utilized from Thomson. From the first 'country' functions majority of the results fell into four countries; Hong Kong, China, Bermuda and Cayman Islands (over 1000 from Bermuda and Cayman Islands). Report by Greguras et al. (2008) states that it is quite common to avoid regulation by incorporating company to Bermuda and Cayman Islands. The problem here was how to recognize the real country behind Bermuda and Cayman Islands. Second 'country' function stated that many of the Bermudan and Cayman Islands companies were actually from China. By combining the two 'country' functions, there were in total 400 Chinese companies (other than H-shares) identified out of the 1479 HKSE listed companies. However, there may be even more Chinese companies within the 1479 HKSE listed companies. Web site NewsGD (2010) states that there were 547 Chinese companies in HKSE in July 2010. China Stock Digest (2011) bring up over 700 Chinese companies in HKSE and Stephen (2011) refers to Nomura and states that there are over 600 Chinese companies listed in Hong Kong. While these sources are not completely reliable

and cannot be used as such, they give some approximations of the amount of Chinese companies listed on HKSE. Since in this study only 400 Chinese companies were identified, this would indicate that there are some Chinese companies among the Hong Kong companies. This problem is mitigated by forming a subsample from the identified Hong Kong companies (excluding all the Bermuda and Cayman Island companies which could be really Hong Kong or Chinese companies). This study has nine different subsamples that are used in the regressions to answer the research question. From the Hong Kong Stock Exchange following groups are sorted out (1) *all companies*, (2) *pure Hong Kong companies*, (3) *Chinese companies*, (4) *H-shares* and (5) *cross-listed.* From Shanghai stock exchange (6) *all companies* and (7) *cross-listed companies* and from Shenzhen exchange the same as from Shanghai − (8) *all companies* and (9) *cross-listed companies.* The descriptive statistics of the groups are presented in Appendix 4.

In the previous studies (see e.g. Fresard and Salva, 2011 and Shen et al., 2008) financial firms are excluded from the sample due to the different balance sheet structure. In order to identify financial firms, Standard Industrial Classification (SIC) system is employed. Major SIC code (two digits) is retrieved for each company. Based on the SIC groups provided by Thomson, the following groups are excluded: *Depository Institutions (SIC 60), Security and Commodity Brokers, Non-depository Credit Institutions (SIC 61), Dealers, Exchanges, and Services (SIC 62), Insurance Carriers (SIC 63), Insurance Agents, Brokers, and Service (SIC 64), Real Estate (SIC 65), Holding and Other Investment Offices (SIC 67).* In total 243 financial firms in the Hong Kong Stock Exchange (63 pure HKSE companies, 35 Chinese companies, 16 H-shares, 12 cross-listed) were excluded. From Shanghai Stock Exchange 119 financial firms were excluded (from which 12 were cross-listed). From Shenzhen Stock Exchange 89 financial firms were excluded (none of them were cross-listed). The amounts of companies in different SIC classes (classified into subsamples) are presented in Table 3. Fresard and Salva (2011) excluded also all the companies with total assets below 100 million. That was not possible with this sample because the sample size is smaller and also the companies are smaller. However, because values of total assets are used to calculate other control variables, companies with exceptionally low total assets value were excluded. Thus, all the observations where company has total assets less than 30 CNY million were excluded.

Table 3. SIC classes
Table presents the used SIC classification and the amount of companies (in the sample) in each class.

SIC Primary code	SIC Primary	Hong Kong	H-shares	Chinese companies	Red Chip shares	Cross-listed	Shanghai	Cross-listed	B-shares	Shenzen	Cross-listed	B-shares
A (0-999)	Agriculture, Forestry and Fishing	9		4	1		11			26		1
B (1000-1499)	Mining	56	9	18	6	6	34	6	1	26		
C (1500-1999)	Construction	75	6	22	10	3	28	3		24		
D (2000-3999)	Manufacturing	601	82	223	28	30	542	19	32	995	11	36
E (4000-4999)	Transportation, Communications, Electric, Gas, And Sanitary Services	113	29	34	20	16	117	16	9	71		6
F (5000-5200)	Wholesale Trade	70	5	8	8	2	34	2	1	23	1	2
G (5300-5999)	Retail Trade	92	4	24	1		44		1	40		2
H (6000-6999)	Finance, Insurance and Real Estate	243	16	35	17	12	119	12	5	89		6
I (7000-8999)	Services	185	12	25	9		39			108		1
J (9000-9999)	Public Administration	12	1	4	2	1	2		5	13		
N/A	Unknown	23		3						4		
	TOTAL	1479	164	400	102	70	970	58	54	1419	12	54

Following previous literature, (see e.g. Fresard and Salva, 2011, Doidge et al., 2004, La Porta et al., 2002 and Shen et al., 2008) Tobin's Q is used as a proxy for the valuation. In this study (following Fresard and Salva, 2011) Tobin's Q is defined as *book value of total assets* minus *book value of equity* plus *market value of equity* in nominator and book value of total *assets* in denominator (formula for Tobin's Q is presented below). The study period is 10 years, from 2001 to 2010. Following previous papers also this study employs annual observations of Tobin's Q. Since the stock exchanges under review are still growing rapidly, there have been many new IPOs during the study period. If this study would focus only on companies listed since 2001 the sample size would diminish dramatically. Therefore newly listed companies are included in the sample and that leads to uneven amount of annual observations.

$$Tobin's\ Q = \frac{book\ value\ of\ total\ assets - book\ value\ of\ equity + market\ value\ of\ equity}{book\ value\ of\ total\ assets} \quad (1)$$

In order to achieve annual Tobin's Q for the companies, the following data was needed: *book value of total assets*, *book value of equity* and *market value of equity*. *Total assets* and *book value of equity* were found from the Thomson database. *The market value of equity* was more complicated since it was not in the databases and it needed to be calculated. The Thomson database provided the amount of shares outstanding and the share prices. Decision was made to utilize each year's end share price and the total common shares outstanding at the year-end. The below table 4 summarizes the data processing in terms of annual observations.

Table 4. Data processing in terms of annual observations

This table describes the part of the data processing where the retrieved data is screened out based on certain factors. In this study the observation for Tobin's Q is necessary and thus all the annual observations could be deleted which does not have value for Tobin's Q. The amount of deleted in this stage consists of annual observations which did not have the data but as well as the annual observations for the companies which were not listed in the particular year. In the next phase all the annual observations which had total assets less than 30 CNY million were deleted. In this stage the number of deleted observations is relatively small because most of the companies with very low total assets amount were already deleted in the previous phase (due to lack of data). In last phase, all the financial companies were deleted. The last row denotes the final amount of Tobin's Q annual observations which are used in tests presented in results section. Notice that the final row does not indicate the number of annual observations for all the used variables (only for Tobin's Q) and thus the observation amount in the tests are lower.

Data retrieval process	Number of annual observations					
	hong Kong		Shanghai		Shenzhen	
Beginning (maximum amount of observations, number of companies multiplied by the study period)	14790		9700		14190	
Excluding companies which do not value for Tobin's Q	10342	-4448	8311	-1389	6896	-7294
Excluding companies which have total assets less than 30 million CNY	10340	-2	8304	-7	6836	-60
Excluding financials and companies which do not have SIC class	8375	-1965	7301	-1003	6065	-771
Final amount of annual observations	8375		7301		6065	

In this paper Tobin's Q act as a proxy for valuation and the significance of stock exchange or cross-listing is captured by the dummy variable (specified in each study). The exchange where the company is listed or the cross-listing is not the only and actually not even the primary variable affecting the valuation. In order to achieve more reliable results in valuation, other variables are needed as controlling variables. In previous studies (such as Fresard and Salva, 2011, Doidge et al., 2009 and Shen et al., 2008) the following control variables have been used (a factor for which the variable act as a proxy for is presented in parenthesis): *natural logarithm of sales* (size), *sales growth* and *capital expenditure ratio* (growth), *debt ratio and volatility of returns* (risk), *return on assets* (profitability), *industry median Tobin's Q* (median industry valuation) and, in addition, *cash ratio* (cash balance). These variables are retrieved from Thomson and Datastream. Fresard and Salva (2011) used also *dividend ratio* as one of the control variables (cash dividends over total assets) but the amount of cash dividends were only found for a fraction of the companies and thus the variable was excluded. Table 5 below presents the control variables used in this study and states the source for each variable.

Table 5. Definitions of the used variables and their sources

This table summarizes all the variables used in this study. Table specifies how the variables are calculated in this study and from where the data is retrieved. Only sales growth and profitability are collected as such and all the other variables needed to be calculated. Thomson One Banker (Worldscope and Reuters) and Datastream were the key sources for the data. Also expected effects for each control variable are presented.

	Proxy Variable	Definition	Expected effect	Source
Valuation	*Tobin Q*	[(Book value of assets - shareholder's equity + market capitalization)/book value of assets]	Dependent variable	Worldscope, Reuters
Listing	*Dummy*	Specified to give positive value if results support hypothesis	+	
Growth	Sales growth	Sales growth between years	+	Datastream
Size	*LN Sales*	Natural logarithm of annual sales	-	Worldscope
Industry valuation level	*Industry Average Tobin's Q - Primary*	Calculated from the SIC Primary codes	+	Worldscope
Growth	*Capex*	Capital expenditures / total assets	-	Reuters
Cash balance	*Cash*	Cash / Total assets	+	Worldscope
Leverage	*Debt*	Debt / Total assets	-	Reuters
Profitability	*ROA*	Profit after taxes / book value of total assets	+	Datastream
Risk	*Return Volatility*	Annual standard deviation of last year's weekly returns	-	Datastream

Table 5 summarizes the expected effect of each control variable. *Dummy* variable is expected to always have a positive sign because it is defined as such that it would match the hypotheses. This way a negative sign on the dummy variable will automatically denote the result against the hypotheses. *Sales growth, ROA* and *cash* variable have positive signs intuitively because they are highly correlated with the success of the company. In addition, the *industry* valuation intuitively has positive effect. *Return volatility* is expected to have a negative effect on the valuation because investors appreciate lower risk. The effect of *size* variable is more difficult to forecast. In the study by Fresard and Salva (2011) size has positive effect but according to Shen et al. (2010) it has a negative effect and in both of the papers the effect is significant. Because this paper concentrates on China and Hong Kong as well as the study by Shen et al. (2010), it is justified to expect size to have a negative effect on the valuation. *Leverage* is also more difficult to judge. Leverage may be positive as such but too much leverage leads to excessively high cost of financial distress and thus can have a negative effect on the valuation. Also in this case Fresard and Salva (2011) and Shen et al. (2010) have different results. With US data the effect is negative and with China/Hong Kong data the leverage has a positive effect (leverage is significant variable in both papers). The

assumption is made in the favor of Shen et al. (2010) for the previously mentioned reasons. Table 5 notes that *capex* variable act as a proxy for growth opportunities but it is still difficult to judge whether it has a positive or negative effect on the valuation. This problem occurs due to the fact that it is impossible to judge whether the capital expenditures are value enhancing or not. Results of Fresard and Salva (2011) indicate that capex variable has a positive sign (Shen et al., 2010 did not include the variable) and therefore the same prediction is made in this study as well. The focus of this study is on the effect of the dummy variable and thus the interpretation of the other variables is left outside the scope of this study.

The purpose of the control variables in the regression is to give more robust findings. Thus including more control variables enhances the model (assuming that the included variables are really explaining the dependent variable). In this study the dummy variable should capture the whole essence of valuation differences that are assumed to rise from the cross-listing or being listed on the specific market. The lack of needed control variables is almost always present, at least, in financial studies. This study follows previous academic literature (mainly Fresard and Salva, 2011) and mainly all the used control variables were available also for the Chinese and the Hong Kong companies. Only dividend to asset –ratio was not available and that had to be left outside the scope. In addition, in this China / Hong Kong context it would have been advantageous to add variables to capture the government ownership (or second biggest owner), amount of sales originating from abroad (or China) and liquidity measures, for instance. However, data for these was not available on the databases and thus these variables were left out.

Statistical studies need to have large enough sample size since too small sample size tends to drive the results insignificant. Therefore it was crucial to include all the data that could be found. Databases have rather many different functions for each variable. Most of the different variables were retrieved and the ones offering the most consistent data and the highest amount of observations were chosen. The variables were also cross-checked to find out whether there are some major differences between the sources. The variables presented above (in Table 5) were chosen from the sources stated. For consistency, all the data was retrieved in millions of CNY.

5.2 Methodology

This section introduces the methodologies employed to conduct this study. Methods are derived from the existing literature; mainly Fresard and Salva (2011) and Shen et al. (2008). Ordinary least squares (OLS) regression will be used as the main methodology. Tobin's Q will be the dependent variable in all of the regressions. The main focus will be on the *exchange or cross-listing dummy* that captures the difference in the valuation which is derived from cross-listing or being listed in a specific exchange. Specifications regarding the dummy variable are explained separately within each study but in all of the studies dummy is specified as such that when the results are in line with the hypotheses it should achieve a positive sign. It is not rational to present all the different regression equations and thus below the main regression equation is presented and all the regressions are different specifications of that equation.

$$\text{Tobin's } Q_{i,t} = \beta_1 \, dummy_{i,t} + \beta_2 Sales\ Growth_{i,t} + \beta_3 LN\ Sales_{i,t} + \beta_4 Industry\ med. Tobin's\ Q_{i,t} + \beta_5 Capex_{i,t}$$
$$+\beta_6 Cash_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 ROA_{i,t} + \beta_9 Volatility_{i,t}$$

(2)

In the equation *i* denotes certain firm and *t* denotes certain year. 'Dummy' is the cross-listing or exchange dummy. Fresard and Salva (2011) explain Tobin's Q by cross-listing dummy, sales growth, LN sales and industry median Tobin's Q in their basic regression. Other explanatory variables presented above and dividends-to-assets ratio were included mainly to show the robustness of the results with more extensive model.

To achieve more conservative results the regression model is adjusted for heteroscedasticity and within firm-clustering. The period-specific differences in the valuation are captured as well by including calendar year fixed effects. These specifications were also made in the study by Fresard and Salva (2011). In addition, the sample is winsorized partly. 90% winsorizing is applied for both tails of *sales growth* and *ROA*. In practice, this means that all the observations in the 5th percentile are replaced with the highest observation in the percentile and all the observations in the 95th percentile are replaced with the lowest observation in the percentile. *Capex, cash and debt* variables are only winsorized from the upper tail but otherwise the similar kind of procedure is applied. In the next section possible problems in the model and mitigations for them are discussed.

5.2.1 Possible problems of the model and the mitigations

The objective of OLS regression is to provide estimations of parameters in the linear model which minimizes the sum of squared distances in a linear approximation. However, to achieve the minimized sum of squared distances, the model has conditions. When error terms in the regression model have non-constant variance the model is said to suffer from heteroscedasticity. Heteroscedasticity can lead to biased standard errors. Regular OLS regression assumes homoscedasticity but that assumption is not always fulfilled in the real life. (Stock and Watson, 2007, p.118-123). The model used in this study is thus adjusted for heteroscedasticity in order to acquire more robust standard errors.

OLS regression also assumes that independent variables are not highly correlated with each other. If the correlation is strong, there is a higher risk of obtaining erratic estimates of the coefficients. If regression results are unsatisfactory because of the correlation it is said that model suffers from multicollinearity. Since the problem most often occurs in time series regressions, the correlations between explanatory variables are examined. (Dougherty, 2002, p.128-136). Table 6 below presents correlation matrix with p-values (p-values denote the significance of the correlation coefficients). The highest correlation is between volatility and LN sales and it is as low as 0.184. It seems unlikely that the model would suffer from multicollinearity.

Table 6. Correlation matrix
This table presents correlation between key control variables and the dependent variable. The correlation matrix has been compiled from all the data from HKSE, SHSE and SZSE. The number of observations used varies slightly between the variables but on an average there is over 24 000 observations for each variable. p values are included and presented in brackets to denote the significance of the correlation coefficients. Symbols ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels.

	Tobin's Q	Sales growth	LN Sales	Industry median Tobin's Q	Capex	Cash	Leverage	ROA	Volatility
Tobin's Q	1								
Sales growth	0.003	1							
	(0.67)								
LN Sales	-0.117***	-0.003	1						
	(0.00)	(0.64)							
Industry median Tobin's	0.167***	-0.006	0.027***	1					
	(0.00)	(0.37)	(0.00)						
Capex	0.023***	0.000	0.079***	0.031***	1				
	(0.00)	(0.99)	(0.00)	(0.00)					
Cash	0.069***	-0.001	0.096***	0.144***	0.056***	1			
	(0.00)	(0.84)	(0.00)	(0.00)	(0.00)				
Leverage	0.067***	0.001	0.038***	-0.010*	0.015**	0.145***	1		
	(0.00)	(0.85)	(0.00)	(0.10)	(0.02)	(0.00)			
ROA	-0.046***	0.002	0.136***	0.012*	0.058***	0.028***	-0.045***	1	
	(0.00)	(0.72)	(0.00)	(0.07)	(0.00)	(0.00)	(0.00)		
Volatility	0.030***	0.012*	0.184***	0.088***	0.092***	-0.010	0.005	-0.05***	1
	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.16)	(0.47)	(0.00)	

Another typical problem of time-series regressions is that dependent variable is correlated in time. This means that dependent variable Y_t is correlated with Y_{t+1}. This problem is called autocorrelation (or serial correlation). Autocorrelation violates the (OLS) assumption that the error terms are uncorrelated. Autocorrelation will not bias the estimates of the regression coefficients but it will tend to underestimate standard errors which will lead to excessively high t-statistics. It is intuitive that the problem of autocorrelation is most often found in the time series regressions where the variables have daily observations, for instance. The observations in this study are annual which makes the possibility of autocorrelation smaller. (Dougherty, 2002, p.337-342). Nevertheless, the Durbin-Watson test was conducted and the test supported the initial assumption that autocorrelation is not an issue in this study.

One of the assumptions behind OLS regression is that large outliers are unlikely. Outlier is an observation which value deviates highly from the rest of the data. Large amount of outliers will lead to misleading regression coefficients. Outliers can exist because of the data errors or just by chance. Outliers should be examined to find out whether they really belong to the data. There are three potential ways to deal with outliers. First, they can be assumed to be part of the data and left without further processing. Second, outliers can be excluded from the data completely (trimming).

The third option is to winsorize the data. Winsorising means that all the observations under/above certain percentiles are replaced with the highest/lowest values of the percentiles. Winsorizing can cover both tails or solely the upper or the lower tail. It is controversial whether winsorizing is justified but as an advantage over trimming winsorizing does not diminish the sample size. It is intuitive that both trimmed sample (assuming that sample size does not diminish in too large extent) and winsorized sample should provide better regression results. In this study 90% winsorizing is employed as mentioned earlier.

In this paper the study period is 2001-2010. The integration of the financial world has led to an increase in correlation of assets across countries in general. The time period 2001-2010 includes better years and worse years in terms of valuation. Normally it is assumed that all the control variables have random values throughout the years and therefore they are treated as random. In this study it is justified to assume that the effects are not entirely random around the different years. This would suggest the using of year fixed effects. To give additional justification, Hausmann test is ran and as a result the test also suggests using the fixed effects. Therefore, and also following Fresard and Salva (2011), calendar year fixed effects are included in the model. The implementation of fixed effects has an effect on regression coefficients as well as on the standard errors. (Stock and Watson, 2007, p.361-123). In the same fashion as specific year can influence the observation, there can also be some correlation within the observations of specific companies. Because this correlation between firms is natural it is allowed by using within firm clustering. This is also done by Fresard and Salva (2011).

6. RESULTS

This section presents the results of this study. The methods described earlier are employed to study the research question '*What are the existing valuation differences between the Chinese and the Hong Kong stock markets and what is the role of cross-listing in the relative valuation?'*. To study the research question and to test the hypothesis, six regressions are conducted for each of the hypothesis varying the used control variables. To allow easier comparison and interpretation of the results, all the regression tables are summarized and presented in Table 7. In the table only the regression results with the most and the least control variables are presented. After the table the results regarding each hypothesis are dealt in more detailed under separate sections. Complete regression tables are presented in appendix 5.

In the regression table below the main focus is on the coefficient and t-value of the variable *'cross-listing and exchange dummy*'. The dummy variable is expected to have positive values and thus if it has a positive value it denotes that the test supports the related hypothesis. In all the regressions Tobin's Q is the dependent variable.

Because the time period of this study is 2001-2010, it allows, at least, a minor view on the development of the valuation difference. In Table 8 the study period is divided into two groups 2001-2006 and 2007-2010 and similar kinds of tests are done to both groups. If the coefficient of the dummy variable has changed the difference could be noticed by comparing the regression results. The results of the analysis of split study period are presented in Table 8 at the end of the results section.

Table 7. Summary of the regression results

This table presents all the regression results covering each hypothesis. Regression results are presented with coefficients and t-statistics (in brackets). Tobin's Q is the dependent variable and the independent variables used are listed on the left. The main focus is on the *Cross-listing or exchange dummy* and it is specified in more detailed below. The sample and the tested hypotheses are stated above the table. The last two rows on the right describe the results of additional test made to cover the valuation differences between non-cross-listed A-shares and B-shares. Expected signs of the coefficients are listed after the variable. The number of observations and the adjusted R-squared received are presented below the regression coefficients and t-statistics. All the regressions include year fixed effects and standard errors, which are adjusted for heteroscedasticity and within firm clustering. Symbols ***, ** and * indicate the statistical significance at the levels of 1%, 5% and 10%, respectively.

Variable	expected sign	H1				H2		H3		H4		additional	
		HK stocks excluding H-shares - A-shares excluding cross-listed		Pure HK stocks - A-shares excluding cross-listed		HK cross-listed shares - A-shares which have cross-listing		Cross-listed A-shares - Non-cross-listed A-shares		HK H-shares - HK stocks excluding H-shares		B-shares - A-shares excluding B-shares and cross-listed shares	
dummy value 1:		A-shares		A-shares		A-shares		Cross-listed A-shares		HK excluding H-shares		*B-shares*	
dummy value 0:		HK stocks		HK stocks		HK cross-listed		Non-cross-listed A-shares		HK H-shares		*A-shares*	
		(1)	(6)	(1)	(6)	(1)	(6)	(1)	(6)	(1)	(6)	(1)	(6)
Cross-listing or exchange dummy	+	**0.259**	**0.196**	**0.974 *****	**0.915 *****	**0.673 *****	**0.671 *****	**0.366 ****	**0.359 ****	**0.439 *****	**0.544 *****	**-1.235 *****	**-1.287 *****
		[0.51]	**[0.33]**	**[6.34]**	**[6.07]**	**[8.97]**	**[8.61]**	**[2.37]**	**[2.06]**	**[2.82]**	**[3.22]**	**[-11.34]**	**[-10.78]**
Sales Growth	+	0.6 **	0.73 *	0.662 ***	0.276 ***	0.131	0.065	0.757 ***	0.27 ***	0.505	0.813	0.734 ***	0.255 ***
		[2.01]	[1.82]	[7.55]	[3.08]	[1.44]	[0.7]	[7.95]	[2.74]	[1.15]	[1.47]	[7.92]	[2.69]
LN (Sales)	-	-0.508 ***	-0.465 ***	-0.5 ***	-0.535 ***	-0.032	-0.03	-0.55 ***	-0.592 ***	-0.391 ***	-0.281 ***	-0.539 ***	-0.578 ***
		[-7]	[-8.18]	[-11.93]	[-10.62]	[-1.62]	[-1.38]	[-12.65]	[-11.3]	[-3.38]	[-3.18]	[-12.7]	[-11.42]
Industry Median Tobin's Q	+	0.942	1.009	0.467 ***	0.403 ***	0.147 *	0.114 *	0.608 ***	0.508 ***	0.958	1.012	0.549 ***	0.433 ***
		[1.51]	[1.39]	[7.11]	[6.31]	[1.92]	[1.67]	[8.4]	[5.94]	[1.22]	[1.16]	[9.44]	[6.83]
Capex	-		2.628		-1.064 ***		-0.113		-1.293 ***		5.685		-1.473 ***
			[1.33]		[-2.58]		[-0.34]		[-2.88]		[1.42]		[-3.23]
Cash	+		2.533 ***		1.128 ***		0.393		1.03 ***		3.059 ***		1.167 ***
			[4.96]		[3.57]		[1.24]		[3.09]		[3.58]		[3.67]
Leverage	-		-0.286		-0.418		0.127		-0.414		0.76		-0.178
			[-0.46]		[-1.52]		[0.58]		[-1.45]		[0.56]		[-0.62]
ROA	+		-3.661		7.583 ***		0.848		8.954 ***		-6.529 *		8.799 ***
			[-1.05]		[9.35]		[1.33]		[8.86]		[-1.77]		[8.86]
Volatility	-		-0.454		0.146		0.028		0.126		-0.56		0.219
			[-0.79]		[0.59]		[0.38]		[0.36]		[-0.79]		[0.69]
Year Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Observations		19121	16039	12816	10345	801	676	12331	9824	8159	7317	12910	10365
Adj. R²		0.041	0.04	0.306	0.326	0.521	0.515	0.32	0.342	0.021	0.027	0.326	0.344

6.1 Relative valuation between the Hong Kong market and the Chinese market

To study the relative valuation between the Chinese and the Hong Kong markets, several regressions are executed. The Hong Kong market is divided into subgroups in order to have different angles studied. To make the results unbiased when the Hong Kong companies are compared to the Chinese, H-shares and the Chinese cross-listed A-shares and B-shares are excluded. In all of these tests 'Cross-listing and exchange dummy' variable has the value of 1 for the Chinese stocks and the value of 0 for the Hong Kong stocks.

It is intuitive to start from the test where all the Hong Kong companies (H-shares excluded) are compared to all the Chinese companies (A-shares and B-shares excluded). Test yields results where the Chinese market is indeed more expensive but the dummy variable is not significant. Therefore the conclusion is that the valuation difference does not deviate significantly from zero. The regression results are presented in Table 7 (the two first results columns from the left under H1). The same test is conducted with two separate groups, one including observations from 2001-2006 and another 2007-2010. When these results are examined (see Table 8) it can be noticed that in 2001-2006 the dummy variable has insignificant value but in 2007-2010 there is a significant difference between the valuation of the Hong Kong markets and the Chinese markets. If the valuation effect between the Chinese and the Hong Kong market has emerged because of the segmentation then it would be more reasonable to assume that it is decreasing in time rather than increasing. On the other hand, if there is a difference due to the liquidity then the price difference could have actually increased.

The expectation is that the Chinese market is more expensive. However, if the whole valuation difference is not derived from just being listed in the Shanghai or Shenzhen Stock Exchange but rather being a Chinese company, the results shown in Table 7 (related to hypothesis 1) could still be understandable. This is due to the fact that excluded HKSE H-shares are not the only the Chinese companies in the Hong Kong market. As mentioned, the sample includes companies incorporated to Cayman Islands and Bermuda and it is difficult to judge whether these companies are from China or Hong Kong (or somewhere else). In order to avoid including companies which real country of origin could not be identified, regressions are done by using the pure Hong Kong companies. This notation *"pure"* refers to the fact that they all are Hong Kong companies that were possible to identify as Hong Kong companies. When the pure Hong Kong companies are compared to A-shares

(B-shares and cross-listed A-shares are excluded from Shanghai and Shenzhen samples) a significant valuation premium exists in the favor of the Chinese companies. Also the valuation difference between the pure Hong Kong companies and all the Chinese companies (the ones identified) listed in the Hong Kong Stock Exchange are being tested. The dummy variable is set to 1 for the pure Hong Kong companies and to 0 for all the Chinese companies listed in Hong Kong. In this regression the coefficients of the dummy variable are negative, which indicates that the Chinese firms listed in Hong Kong could be more highly valued than the pure Hong Kong companies. Nevertheless, since the coefficients are not significant it is difficult to draw reliable conclusions.

Similar tests are also conducted to both Shanghai and Shenzhen individually to find out whether another market dominates the valuation difference. Based on the results, the companies from both exchanges are more expensive than the pure Hong Kong companies and the coefficients are highly significant. When further analyzed, it seems that Shenzhen is valued slightly higher than Shanghai. This may be explained by the large amount of small companies in Shenzhen compared to the Shanghai Stock Exchange.

When the coefficients of the dummy variable in Table 8 are examined, it shows that the A-shares have been more highly valued in 2001-2006 than in 2007-2010. This result is not in line with the previous one and it is thus difficult to interpret. If the results from the regression where the Hong Kong stocks (excluding H-shares) are compared to A-shares (excluding cross-listed) were rejected the Table 8 would suggest that the valuation difference has decreased in time. As mentioned earlier, this could imply that the capital market segmentation may be a possible cause of the valuation difference.

The Hong Kong Stock Exchange has also shares called *'red chip shares'* which are companies incorporated in Hong Kong but which have most of their business in China. To test whether A-shares' valuation premium originates from the fact that companies do business in China, the 'red chip shares' are tested against the non-cross-listed A-shares. Coefficients are still positive and significant suggesting that the Chinese companies are more highly valued. However, the coefficient of cross-listing and exchange dummy drops from almost 0.9 to 0.3 in each regression. This could suggest that the 'red chip shares' have slightly higher valuation than the overall Hong Kong market.

6.1.1 Valuation differences between Hong Kong H-shares and the same companies traded in Shanghai and Shenzhen

The law of one price indicates that two similar assets should have the same price. However, due to the market restrictions in China it can be expected that the law of one price is violated. Also the Hang Seng China AH Premium Index, which tracks the valuation differences between the two share classes of cross-listed companies, Hong Kong H-shares and cross-listed A-shares, indicates that there could be a valuation premium in the favor of A-shares. This valuation difference is tested with regressions where the sample includes all the companies having cross-listed from China to Hong Kong. Basically the sample includes the same companies from different markets. In these regressions the Chinese A-shares have the 'cross-listing or exchange dummy' with a value of 1 and the Hong Kong H-shares have dummy with a value of 0.

Comparison between the cross-listed Hong Kong H-shares and the cross-listed A-shares (comparison concerns the same companies listed in different stock exchanges) yields positive and significant valuation premium in the favor of A-shares. The regression results are presented in Table 7 (the fifth and the sixth results columns from the left below H2). For complete regression results see Appendix 4.

All the Chinese companies with H-shares do not necessary have cross-listing because they do not have to be listed in the Mainland China. The above presented test is done for all the H-shares versus cross-listed A-shares. Also in this case there is a valuation premium in the favor of A-shares. When Hong Kong's cross-listed H-shares are compared with all the A-shares (excluding all the cross-listed companies and the B-shares), there does not exist significant valuation difference. That supports the argument that the A-shares with cross-listing are valued at a premium. In addition, Table 8 shows that the effect of the dummy variable has not changed significantly when comparing the regression results from 2001-2006 and 2007-2010.

6.2 Cross-listing premium

Several earlier studies have reported that companies with cross-listing have higher valuation than companies that do not have cross-listing (see e.g. Doidge et al., 2004). This phenomenon has been named as *cross-listing premium* in several papers (also known as bonding premium). Shen et al. (2008) report cross-listing premium also in the framework of China and Hong Kong. In this paper the cross-listing premium is studied by comparing all the A-shares with cross-listing to all the non-

cross-listed A-shares. As hypothesis 3 states, it is expected that companies that have cross-listing have valuation premium and thus cross-listed A-shares have dummy value of 1 and non-cross-listed have dummy value of 0.

Regressions in which the cross-listed A-shares are compared to the non-cross-listed A-shares suggest that there is a valuation premium in favor of the cross-listed shares. The regression coefficient for dummy variable does not significantly change although the model is controlled by additional variables such as capex, cash, leverage, ROA and volatility. The Table 7 above presents the results of the conducted regression (seventh and eighth results columns from the left below H3). The regression results in Table 8 suggest that the valuation premium of cross-listed shares have increased when comparing the time periods of 2001-2006 and 2007-2010.

In addition to the cross-listing premium, Shen et al. (2008) study also the valuation of B-shares. They discovered that also the B-shares have a valuation premium over A-shares (excluding cross-listed A-shares). When this test is re-done, the results are entirely opposite (see Table 7, last two columns from the right) as B-shares have quite high valuation discount (significant coefficient) over the A-shares. Because B-shares are accessible for foreign investor as well as for the local Chinese investors, it could indicate a valuation premium. Nevertheless, the price discount can be explained by diminishing demand from foreign investors since, as earlier mentioned, the H-shares have replaced the B-shares in some extent. In addition, the liquidity theory could explain the price difference because B-shares are less liquid than the regular A-shares, which decreases the demand from the local Chinese investors.

6.3 Cross-listing discount

Following Fresard and Salva (2011) the valuation differences between cross-listed shares and target market peers are studied. As mentioned, the results suggest that the Chinese shares are more expensive than Hong Kong shares. Now it is studied whether the valuation premium is tied to the companies or to the market. If the valuation premium is tied to the companies then also the same companies cross-listed to the Hong Kong market (cross-listed H-shares) should be valued higher than the pure Hong Kong companies. If the evidence is contrary, it would suggest that valuation premium is tied to the Chinese market. According to Fresard and Salva (2011) it is expected that the Hong Kong companies would be more highly valued than the cross-listed Chinese companies. This would imply a *cross-listing discount* in Hong Kong.

To test the cross-listing discount, a regression is conducted with a sample consisting of cross-listed H-shares and all the other Hong Kong companies. Table 7 describes the results of the regression (ninth and tenth results columns from the left under H5). Again, the focus is on the cross-listing and exchange dummy variable and the cross-listed H-shares are set have a dummy value of 0 and all the other Hong Kong companies have the dummy value of 1. According to the results it seems that cross-listed companies do not reach the valuation level of the original Hong Kong companies. These results are supporting the hypothesis 4 and also in line with the results by Fresard and Salva (2011). Similar kinds of results are achieved when cross-listed companies are tested against the pure Hong Kong companies. Nevertheless, in this regression the coefficients are slightly lower but significant. This could suggest that part of the premium is driven by the other Chinese companies listed in Hong Kong. However, replacing the cross-listed H-shares with all the H-shares the results do not change.

In these regression results the models have very low adjusted R-squared values. In addition, many of the control variables are insignificant. This refers to an unsatisfactory model and would suggest adding more variables and possibly leaving out some of the existing ones. When the pure Hong Kong companies are used as a proxy for the original Hong Kong companies, the model reaches higher (approximately 0.13) adjusted R-squared value and more control variables are significant. Still, the level of R-squared is not particularly high.

Table 8. Analysis of split study period (2001-2006 & 2007-2010)

This table presents the regression results with coefficients and t-statistics (in brackets). Tobin's Q is the dependent variable and the independent variables used are listed on the left. The main focus is on the *Cross-listing or exchange dummy* and it is specified in more detailed below. The sample and the tested hypotheses are stated above the table. The last two rows on the right describe the results on additional test made to cover the valuation differences between non-cross-listed A-shares and B-shares. Expected signs of the coefficients are listed after the variable. The number of observations and the adjusted R-squared received are presented below the regression coefficients and t-statistics. All the regressions include year fixed effects and standard errors, which are adjusted for heteroscedasticity and within firm clustering. Symbols ***, ** and * indicate statistical significance at the levels of 1%, 5% and 10%, respectively.

		H1		H2		H3		H4				additional	
		HK stocks excluding H-shares - A-shares excluding cross-listed		Pure HK stocks - A-shares excluding cross-listed		HK cross-listed shares - A-shares which have cross-listing		Cross-listed A-shares - Non-cross-listed A-shares		HK H-shares - HK stocks excluding H-shares		B-shares - A-shares excluding B-shares and cross-listed shares	
dummy value 1:		A-shares		A-shares		A-shares		Cross-listed A-shares		HK excluding H-shares		B-shares	
dummy value 0:		HK stocks		HK stocks		HK cross-listed		Non-cross-listed A-shares		HK H-shares		A-shares	
		2007-2010	2001-2006	2007-2010	2001-2006	2007-2010	2001-2006	2007-2010	2001-2006	2007-2010	2001-2006	2007-2010	2001-2006
Variable	**Expected sign**	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)
Cross-listing or exchange dummy	+	**0.732 ****	**-0.022**	**0.741 *****	**1.321 *****	**0.627 *****	**0.663 *****	**0.612 ****	**0.113**	**0.615 *****	**0.454 ***	**-1.049 *****	**-1.633 *****
		[2.35]	**[-0.04]**	**[5.45]**	**[7.17]**	**[7]**	**[9.37]**	**[2.42]**	**[0.9]**	**[4.84]**	**[1.77]**	**[-12.79]**	**[-9.35]**
Sales Growth	+	1.068	0.446 **	0.192 **	0.396 **	-0.001	0.084	0.342 *	0.194 ***	1.177	0.442 *	0.195 ***	0.311 *
		[1.46]	[2.3]	[2.51]	[2.27]	[-0.01]	[0.61]	[1.74]	[2.68]	[1.17]	[1.7]	[2.87]	[1.65]
LN (Sales)	-	-0.515 ***	-0.427 ***	-0.39 ***	-0.65 ***	-0.034	-0.028	-0.696 ***	-0.428 ***	-0.229 ***	-0.356 **	-0.418 ***	-0.69 ***
		[-7.88]	[-4.85]	[-8.43]	[-8.58]	[-1.14]	[-1.46]	[-8.86]	[-8.96]	[-2.87]	[-2.1]	[-9.28]	[-9.07]
Industry Median Tobin's Q	+	0.626 ***	1.117	0.153 *	0.449 ***	0.193 ***	0.036	0.479 ***	0.357 **	0.587 *	1.102	0.119	0.481 ***
		[2.94]	[1.11]	[1.81]	[6.18]	[2.92]	[0.83]	[5.67]	[2.51]	[1.67]	[1.05]	[0.93]	[5.95]
Capex	-	5.108	0.782	-1.094 ***	-0.727	0.192	-0.317	-1.031	-1.116 ***	10.633	1.215	-1.132 ***	-1.454 **
		[1.25]	[1.07]	[-3.06]	[-1.06]	[0.41]	[-0.8]	[-1.43]	[-2.99]	[1.32]	[0.82]	[-3.06]	[-1.98]
Cash	+	3.04 ***	2.05 ***	0.313	1.842 ***	0.41	0.307	1.691 ***	0.218	3.572 ***	2.628 ***	0.297	1.893 ***
		[3.78]	[3.06]	[1.33]	[3.47]	[0.89]	[1.17]	[3]	[0.95]	[2.61]	[2.71]	[1.4]	[3.48]
Leverage	-	-0.989	0.324	0.16	-0.806 *	-0.138	0.465 ***	-0.769	0.07	0.101	1.222	0.199	-0.413
		[-0.87]	[0.77]	[0.67]	[-1.73]	[-0.42]	[2.85]	[-1.61]	[0.29]	[0.04]	[1]	[0.85]	[-0.85]
ROA	+	-3.232	-4.18	5.726 ***	8.968 ***	0.384	1.343	10.806 ***	6.268 ***	-7.354	-5.684	5.69 ***	11.052 ***
		[-0.75]	[-0.82]	[9.51]	[7.05]	[0.46]	[1.42]	[7.09]	[8.75]	[-1.51]	[-1.12]	[8.19]	[7.39]
Volatility	-	-0.117	-0.925	0.492 **	-0.283	-0.012	-0.027	-0.095	0.869 ***	0.077	-1.08	0.467 *	-0.012
		[-0.45]	[-0.98]	[2.36]	[-0.72]	[-0.12]	[-0.25]	[-0.19]	[2.88]	[0.24]	[-0.93]	[1.84]	[-0.02]
Year Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Observations		7697	8342	5417	10344	335	341	4745	5078	3533	3784	5415	4950
Adj. R²		0.064	0.029	0.293	0.317	0.509	0.5	0.321	0.32	0.04	0.024	0.326	0.329

7. ROBUSTNESS CHECKS

This section covers the robustness checks of the results. Three robustness checks have been conducted to enable better scrutiny of the results. Next all the robustness checks and their results are presented briefly. First, the same tests conducted and presented in the result section are done without winsorizing. If winsorizing had distorted the results this robustness test would reveal it. Second robustness check, following Fresard and Salva (2011), takes more conservative approach to excluding companies based on their total assets. In the basic test companies with total assets less than 30 CNY million have been excluded. For the robustness check, companies with total assets less than 500 CNY million have been excluded in order to minimize the possible influence of the small companies. In the third robustness check Tobin's Q as the dependent variable is replaced by another proxy for valuation, EV/EBITDA multiple. This test allows checking whether the significance of the cross-listing and exchange dummy remains as strong as in the basic results. However, this test will not allow the scrutiny of the coefficients as such since EV/EBITDA and Tobin's Q are not in a same scale. Regression results of the robustness checks are presented in appendices 1-3.

Non-winsorized regressions yield similar kind of results than the winsorized ones. Neither regression coefficients nor the t-statistics have any major deviation compared to the winsorized results. That would suggest that outliers of the sample were not that noteworthy to distort the results.

The second robustness check shows that small companies do influence the results. The most important result of the second robustness check is that the cross-listing and exchange dummy coefficients in the regressions related to the hypothesis 3 (cross-listing premium) turn negative. In other words, the results indicate that when smaller companies are excluded from the sample there is no cross-listing premium found in China. The dummy coefficient is not significant and thus the model implies that there is no significant difference in the valuation of cross-listed and non-cross-listed A-shares. Also the results regarding the hypothesis 1 deviate from the basic results. Basic results were insignificant regarding the valuation difference between all the Hong Kong stocks and all the A-shares. However, the results from the second (and the third) robustness check are significant regarding the tests for the hypothesis 1. The difference between the results presented in Table 7 and in Appendix 2 could originate from the influence of smaller companies. In overall, R-squared of all the regressions increase significantly and t-statistics increase considerably, at least in

some of the regressions. This suggests that the model works better theoretically by excluding more companies based on the total assets but, on the other hand, valuable information would be left out. This is also an argument why the conservative total asset exclusion is dealt as robustness check and also smaller companies were included in the main sample.

In the third robustness check, the dependent variable and simultaneously the proxy for valuation is changed to EV/EBITDA. The regression results of the third robustness check are quite similar than in the second robustness check. The test for hypothesis 1 where the Hong Kong stocks (excluding H-shares) are compared with A-shares (excluding cross-listed) is also significant while it was insignificant in the basic results. Also similar to the second robustness check, the third robustness check does not indicate significant cross-listing premium in China. In addition, the regressions' R-squared figures increase as well as the t-statistics of the regressions. To conduct the third robustness check additional data was retrieved and it had minor influences to the sample when compared to the original sample. Consequently it is difficult to judge whether this change in the results is due to the EV/EBITDA as such or whether it is resulting from the fact that the data was not available for smaller companies and thus they were excluded.

In overall, the performed robustness checks support the achieved main results and the hypotheses except results and expectation related to the hypothesis 3. In addition, the robustness checks may introduce new evidence suggesting that company valuation has significant relevance in valuation differences between the Hong Kong and the Chinese stock markets.

8. CONCLUSIONS

A recent paper by Fresard and Salva (2011) discovered a cross-listing discount in US (discount in favor of the cross-listed companies when compared to the target market peers). That particular paper inspired this study. The purpose of this study was to examine the valuation differences between the Hong Kong and the Chinese stock markets and to study the role of cross-listing in the valuation differences. The Chinese stock market is still suffering from the problems of communist country and therefore there are certain restrictions for the investors. These restrictions combined with the cross-listing activity from China to Hong Kong offer interesting grounds for the study.

This study concentrates on testing the four hypotheses related to the research question. First, the overall valuation differences between China and Hong Kong are being studied. Second, the test covers the valuation difference between the Hong Kong H-shares (the Chinese companies listed to Hong Kong) and the cross-listed Chinese A-Shares. Effectively those are the same companies listed in both exchanges. In both of these tests the valuation effect is expected to be in favor of the Chinese companies. The third hypothesis expects that the Chinese companies with cross-listing are relatively more valuable than the non-cross-listed Chinese companies. This valuation difference is called *cross-listing premium.* The final test follows Fresard and Salva (2011) to find out whether the cross-listed Chinese companies reach the relative valuation of the original Hong Kong companies. The final hypothesis expects that there is a cross-listing discount in Hong Kong and therefore the cross-listed H-shares are less valuable than the Hong Kong peers. Tobin's Q acts as a proxy for the valuation and it is the dependent variable in all the regression models employed. Table 9 presents a summary of the studied hypotheses and obtained results related to each one.

Overall, evidence is found to support all the hypotheses. In the base case results there is no significant valuation difference between all the Hong Kong companies and the Chinese A-shares. However, when Table 8 (regressions for a split sample based on time period of the study) is examined it can be noticed that there is a significant valuation effect during 2007-2010 but not during 2001-2006. This would suggest that the valuation difference has increased during the study period. It is possible that this difference makes the results insignificant in the base case results. The robustness check regarding larger exclusion of small companies (observations with total assets less than 500 CNY million are excluded) and robustness check where Tobin's Q is replaced by EV/EBITDA (see appendices 2 and 3) found significant valuation difference between all the Hong Kong companies and the Chinese A-shares (in favor of the A-shares).

Regarding the first hypothesis, when Hong Kong sample is limited to cover only pure Hong Kong companies, there is a significant valuation difference existing in favor of the Chinese shares. This could suggest that the other Chinese companies, not having H-share status, listed in the Hong Kong Stock Exchange are more highly valued than the pure Hong Kong companies.

The second hypothesis expects that the cross-listed A-shares are more valuable than the same companies' H-shares traded in Hong Kong. The second hypothesis is supported by the basic results as well as the robustness checks. When the change in the valuation difference is further examined in Table 8 it suggests that the valuation difference has decreased during the study period. Based on the literature, the overall valuation difference between markets could be explained by the capital market segmentation theory. In the academic literature it is argued that the Chinese investment restrictions can be a reason for the higher valuation compared to Hong Kong. The valuation difference between the same shares (H-shares and A-shares) traded in different markets is interesting due to the fact that there are the same voting and cash flow rights existing for both investors. This valuation difference can be driven by the Chinese stock market restrictions, as well. In addition, the liquidity theory and the information asymmetry theory can also explain the valuation difference.

Based on the basic results there are significant valuation differences between the cross-listed Chinese companies and the non-cross-listed Chinese companies. This valuation difference would suggest that there is a cross-listing premium in China. Nevertheless, the above-mentioned robustness checks provide opposite evidence and those models found no significant valuation effect for cross-listing to Hong Kong. From the total asset robustness check (see Appendix 2) it can be concluded that smaller companies contribute to the cross-listing premium. Also Table 8 adds to the analysis. The table shows that the valuation difference has been larger during the years 2007-2010 compared to 2001-2006. This evidence would indicate an increasing valuation differences between the markets. This is rather unintuitive when assuming that the legal bonding theory could explain part of the difference. When presumed that the level of corporate governance has increased in China during the study period it would be more intuitive to find out that the cross-listing premium would have decreased. Despite of the result, the cross-listing discount is a sum of different factors and still the legal bonding theory could have the effect described above.

Following Shen et al. (2008) the B-shares' valuation is compared to the valuation of non-cross-listed A-shares. Shen et al. (2008) find out that there is a valuation premium in favor of the B-shares but this study states the opposite. Regular A-shares are found to be more highly valued. This result is quite intuitive when presumed that the H-shares have mainly replaced the need for the B-shares. In addition, based on the results the cross-listing premium is not that solid because it does not exist between larger companies. It would be counter-intuitive that there would be a premium in B-shares.

Similar to the US market (see Fresard and Salva, 2011), it is argued that the cross-listed companies do not reach the valuation level of the target market peers. The base case results as well as the robustness check results support the fact that there is a cross-listing discount existing. Fresard and Salva (2011) conclude that at least part of the valuation difference is driven by the differences in the level of corporate governance. Also the significance of the home equity bias is recognized. Since the sample of Fresard and Salva (2011) included wide range of countries, they also concluded that cultural factors as well as proximity have a role in the valuation differences. However, the proximity and the cultural factors would not suggest large valuation differences between China and Hong Kong. Nevertheless, the difference in the business culture and the level of corporate governance as well as home bias could influence the established valuation difference.

When the results from the Table 8 are analyzed in unity they suggest that the valuation effects have increased when comparing 2007-2010 and 2001-2006. Only the results regarding the first test of hypothesis 1 would suggest that the valuation effect has decreased. Otherwise the second results regarding hypothesis 1 and the results related to hypothesis 3 and hypothesis 4 suggest an increase in the valuation effect. The results related to hypothesis 3 have remained at the same level. This result could be seen as unintuitive because one could easily assume that the valuation differences would be balanced over time. However, another point of view could also be taken. It is questionable whether the Chinese market has had development in corporate governance standards that significantly during the two time periods and whether there have been activities to decrease the capital market segmentation. In addition, on the contrary, the liquidity has increased in the Chinese markets and that could further increase the valuation effects. All in all, the Table 8 provides additional information about the development of the valuation differences but does not provide answers why this development has happened.

In overall the used regressions achieve fairly low R-squared, which suggests that the models are not that efficient in explaining the valuation (Tobin's Q). Since the R-squared figures increase in the second robustness check as additional companies are excluded based on the total assets, it suggests that the model may be better when considering only larger companies. When the tests are performed additional variables are included in the regressions as control variables. In each of the regression models the expected signs are presented for all the control variables (explained and presented in section 5). Volatility, leverage and capex do not always hold the expected signs but other control variables (LN sales, median industry Tobin's Q, cash ratio, sales growth and ROA) influence mainly in a way it was expected.

This study contributes to the earlier literature by providing a comprehensive and recent study on the valuation differences between Hong Kong and China. In addition, this study covers the current literature in the field of cross-listing. Examining the factors explaining the found valuation differences was left outside the scope of this study and that provides an interesting issue for future research. In addition, quite many Chinese companies are listed in US and also some in Singapore and thus the same research setting could be exploited in those markets (if there is enough data available to take the advantage of statistical tests). That would also provide interesting grounds for further studies.

Table 9. Summary of the hypotheses

This table summarizes the hypotheses and shows whether the study findings support them.

	Hypotheses	Results
H1	*The Chinese stock markets (both SHSE and SZSE) are relatively more expensive than the Hong Kong stock market.*	Basic results support the hypothesis when only pure Hong Kong companies are included. Second and third robustness chekcs support the hypothesis fully.
H2	*H-shares of the Chinese companies traded in HKSE are relatively worth less than the same companies share class trading in SHSE/SZSE.*	Basic results as well as all three robustness checks support the hypothesis.
H3	*The A-shares of the Chinese companies which have cross-listed to Hong Kong have relatively higher valuation than non-cross-listed A-share peers.*	Results are mixed and the hypothesis is difficult to accept as such. Basic results support the hypothesis but second and third robustness checks suggest opposite.
H4	*H-shares of the cross-listed companies have relatively lower valuation than other Hong Kong peers.*	Basic results as well as all three robustness checks support the hypothesis.

9. REFERENCES

Allen, Franklin., Qian, Jun. and Qian, Meijun. 2005. Law, finance, and economic growth in China. *Journal of Financial Economics* 77, 57-116.

Amihud, Yakov. and Mendelson, Haim. 1986. Asset Pricing and the Bid-Ask Spread. *Journal of Financial Economics* 17, 223-249.

Bai, Chong-En., Liu, Qiao., Lu, Joe., Song, Frank M. and Zhang, Junxi. 2004. Corporate Governance and Market Valuation in China. *Journal of Comparative Economics* 324, 599-616.

Benosa, Evangelos. and Weisbach, Michael S. 2004. Private benefits and cross-listings in the United States. *Emerging markets preview* 5, 217-240.

Bris, Arturo., Cantale, Salvatore. and Nishiotis, George P. 2007. A Breakdown of the Valuation Effects of International Cross-listing. *European Financial Management* 13, 498-530

Cai, Joseph J., Li, Yuming., Xia, Le. and Zhang, Sylvia Y. 2007. What Will Privatization Bring: The Non-tradable Share Issue Reform in China. *Working paper*.

Cetorelli, Nicola. and Peristiani, Stavros. 2010. Firm Value and Cross-Listings: The Impact of Stock Market Prestige. *Federal Reserve Bank of New York – report 474*.

Chakravarty, Sugato., Sarkar, Asani. and Wu, Lifan. 1998. Information Asymmetry, Market Segmentation and the Pricing of Cross-listed Shares: Theory and Evidence from Chinese A and B Shares. *Working paper.*

Chen, Chao., Jin, Quiglu. and Yuan, Hongqi. 2011a. Agency problems and liquidity premium: Evidence from China's stock ownership reform. *International Review of Financial Analysis* 20, 76-87.

Chen, Gongmeng., Firth, Michael. and Xu, Liping. 2009. Does the type of ownership control matter? Evidence from China's listed companies. Journal of Banking & Finance 33, 171-181.

Chen, Donghua., Guan, Yuyan., Zhao, Gang. and Wu, Feifer. 2011b. Securities regulation and implicit penalties. *China Journal of Accounting Research* 4, 57-62.

Chen, Shaw., Lin, Bing-Xuan., Wang, Yaping. and Wu, Liansheng. 2008. Cross-Listing, Corporate Governance and Operating Performance - Evidence from the Chinese Market. *Advances in Business and Management Forecasting* 5, 19-46.

Chen, Zhiwu. 2003. Capital markets and legal development: The China case. *China Economic Review 14*, 451-472.

Chi, Wei. and Zhang, Haiyan. 2009. Are Stronger Executive Incentives Associated with Cross-listing? Evidence from China. *Working paper*.

China Stock Digest. 2011. China Stocks Listed on the Hong Kong Stock Exchange. Retrieved: 13.12.2011. URL: http://www.chinastockdigest.com/articles/China-Stocks-Listed-on-the-Hong-Kong-Stock-Exchange.html

China Stock Venture. 2011. China QFII member list. Retrieved 17.11.2011. URL: http://chinastockventure.com/2011/08/qfii-member-list-august-2011/.

Chouinard, Eric. and D'Souza, Chris. 2004. The Rationale for Cross-Border Listings. *Bank of Canada Review – winter 2003-2004.*

Clarke, Donald C. 2006. The Independent Directors in Chinese Corporate Governance. *Delaware Journal of Corporate Law 31*, 125-228.

Coffee, John C. J. 1998. The Future as History: The Prospects for Global Convergence in Corporate Governance and its Implications. *Working paper*.

Coffee, John C. J. 2002. Racing Towards the Top: The Impact of Cross-Listings and Stock Market Competition on International Corporate Governance. *Working paper.*

Conyon, Martin J. and He, Lerong. 2011. Executive compensation and corporate governance in China. *Institute for Compensation Studies 6,* 1-51.

Cumming, Douglas., Humphery-Jenner, Mark L. and Wu, Eliza. 2011. Home-Country Governance and Cross-Listing in the US. *Working Paper.*

Gagnon, Louis. and Karolyi, G. Andrew. 2010. Do International Cross-Listing Still Matter? *Johnson School Research Paper Series* 32.

Dodd, Olga. 2011. Price, Liquidity, Volatility, and Volume of Cross-listed Stocks. *Doctoral Thesis – Durham University.*

Doidge, Craig., Karolyi, G. A., Lins, Karl V., Miller, Darius P. and Stulz, Rene M. 2009. Private Benefits of Control, Ownership, and the Cross-listing Decision. *Journal of Finance* 64, 425-466.

Doidge, Craig., Karolyi, G. A. and Stulz, Rene M. 2004. Why Are Foreign Firms Listed in the US Worth More. *Journal of Financial Economics 71* , 205-238.

Domowitz, Ian., Glen, Jack. and Madhavan, Ananth. 1997. Market Segmentation and Stock Prices: Evidence from an Emerging Market. *The Journal of Finance* 3, 1059-1085.

Dougherty, Christopher. 2002. Introduction to Econometrics (2nd edition). *Oxford University press, New York*

Ernst&Young. 2011. Report of global IPO trends. Retrieved 7.11.2011 URL:
www.ey.hu/Publication/vwLUAssets/Global-IPO-trends_2011/$FILE/Global%20IPO%20trends%202011.pdf

Fan, Joseph P. H., Wong, T. J. and Zhang, Tianyu. 2007. Politically connected CEOs, corporate governance, and Post-IPO performance of China's newly partially privatized firms. *Journal of Financial Economics* 84, 330–357.

Firth, Michael., Fung, Peter M. Y. and Rui, Oliver M. 2006. Corporate performance and CEO compensation in China. *Journal of Corporate Finance* 12, 693-714.

Foerster, Stephen R. and Karolyi, Andrew G. 1999. The effects of market segmentation and investor recognition on asset prices: Evidence from foreign stock listings in the U.S. *Journal of Finance* 54, 981-1014.

Fresard, Laurent. and Salva, Carolina. 2011. Is There a Cross-Listing Discount. *Working paper.*

Gozzi, Juan C., Levine, Ross. and Schmukler, Sergio L. 2008. Internationalization and the evolution of corporate valuation. *Journal of Financial Economics* 88, 607-632.

Greguras, Fred., Bassett, Bart. and Zhang, Jianwei. 2008. Doing Business in China via the Cayman Islands. *Fenwick & West report.*

Guo, Lin., Sun, Zhenzhen. and Tong, Yu. 2010. Why Do Chinese Companies Dual-List Their Stocks. *Working paper.*

Hail, Luzi. and Leuz, Christian. 2003. International differences in the cost of equity capital: do legal institutions and securities regulation matter. *Working paper.*

Hang Seng Indexes Company Limited. 2011. Real-time Indexes. Retrieved 09.11.2011. URL:
http://www.hsi.com.hk/HSI-Net/HSI-Net

Hong Kong Stock Exchange. 2011. List of H Share Companies. Retrieved 20.10.2011. URL:
http://www.hkex.com.hk/eng/stat/smstat/chidimen/cd_hmb.htm

Hope, Ole-Kristian., Kang, Tony. and Zang, Yoonseok. 2007. Bonding to the Improved Disclosure Environment in the US: Firms' Listing Choices and their Capital Market Consequences. *Journal of Contemporary Accounting & Economics* 1, 1-33.

Huo, Yun. 2011. China's equity index futures market is poised to take off. *Nomura Research Institute.*

Jian, Zhou., Tingting, Zhang. and Shengchao, Cui. 2011. Cross Listing, Corporate Governance and Operating Performance - Empirical Evidence of Hong Kong -Listed Chinese Companies. *Nankai Business Review International* 2, 275-288.

King, Michael R. and Segal, Dan. 2003. Corporate Governance, International Cross Listing and Home Bias. *Working paper.*

La Porta, Rafael., Lopez-De-Silanes, Florencia., Shleifer, Andrei. and Vishny, Robert. 2002. Investor Protection and Corporate Valuation. *Journal of Finance* 3, 1147-1170.

Lee, Bong-Soo., Rui, Oliver. and Wu, Wenfeng. 2007. Market Segmentation and Stock Prices Discount in the Chinese Stock Market: Revisiting B-share discounts in the Chinese stock market. *Working paper.*

Lee, Hing-Wah. 2009. The Price Premium of China A-Shares over Hong Kong H-Shares: A Further Visit of the Liquidity Hypothesis. *Asia-Pacific Journal of Financial Studies* 5, 654-694.

Li, Shengnan. and Niu, Jianbo. 2009. Corporate Governance and Governance Premium: Evidence from China. *Working paper.*

Licht, Amir N. 2003. Cross-Listing and Corporate Governance: Bonding or Avoiding? *Chicago Journal of International Law* 4, 141-163.

Liu, Guy S. and Sun, Pei. 2005. The Class of Shareholdings and its Impacts on Corporate Performance: a case of state shareholding composition in Chinese public corporations. *Corporate governance* 131, 46-59.

MCF Global Investment Management. , 2010. An Institutional Investor's guide to China A-shares, .

Merton, Robert C. 1987. A Simple model of Capital Market Equilibrium with Incomplete Information.
The Journal of Finance 3, 483-510

NewsGD. 2010. 547 Chinese mainland companies listed on Hong Kong bourse. Retrieved: 13.12.2011. URL: http://www.newsgd.com/news/PearlRiverDelta/content/2010-08/30/content_15339992.htm

OECD. 2005. OECD Glossary of Statistical Terms. Retrieved 18.11.2011. URL: http://stats.oecd.org/glossary/detail.asp?ID=6778

Pagano, Marco., Roell, Ailsa A. and Zechner, Josef. 2002. The Geography of Equity Listing: Why Do Companies List Abroad? *The Journal of Finance* 6, 2651-2694.

Peng, Wensheng., Miao, Hui. and Chow, Nathan. 2007. Price convergence between dual-listed A and H shares. *Hong Kong Monetary Authority - China Economic Issues* 6.

Pistor, Katharina. and Xu, Chenggang. 2005. Governing Stock Markets in Transition Economies: Lessons from China. *American Law and Economies Review* 7, 184-210.

Reese, William A. J. and Weisbach, Michael S. 2002. Protection of minority shareholder interests, cross-listings in the United States, and subsequent equity offerings. *Journal of Financial Economics* 66, 65-104.

Roosenboom, Peter. and Van Dijk, Mathijs A. 2009. The market reaction to cross-listings: Does the destination market matter? *Journal of Banking & Finance* 33, 1898-1908.

Sarkissian, Sergei. and Schill, Michael J. 2009. Are There Permanent Valuation Gains to Overseas Listing? *The Review of Financial Studies* 22, 371-412.

Sarkissian, Sergei. and Schill, Michael J. 2004. The Overseas Listing Decision: New Evidence of Proximity Preference. *Review of Financial Studies* 17, 769-809.

Seah, Peishee., Tan, Jeremy. and Hsiang, Amy. 2005. Why are the shares of People's Republic of China (PRC)-domicile companies with cross listings in China's stock exchanges priced differently. *IFM Fall Final Paper.*

Shen, Hongbo., Liao, Li. and Liao, Guanmin. 2008. Cross-Listing and Bonding Premium: Evidence form Chinese Listed Companies. *Finance & Trade Economics* 9, 40-45.

Siegel, Jordan. 2005. Can foreign firms bond themselves effectively by renting U.S. securities laws? *Journal of Financial Economics* 75, 319-359.

Stapleton, R. C. and Subrahmanyam, M. G. 1977. Market Imperfections, Capital Market Equilibrium and Corporate Finance. The Journal of Finance 322, 307-319.

Stephen, Craig. Market Watch. 2011. China's U.S.-listed stocks are junk. Retrieved: 13.12.2011. URL: http://www.marketwatch.com/story/chinas-us-listed-stocks-are-junk-2011-07-10

Stock, James H. and Watson, Mark W. 2007. Introduction to Econometrics (2nd edition). *Pearson Education Inc., Boston.*

Stulz, Rene M. 1999. Globalization, Corporate Finance and Cost of Capital. *Journal of applied corporate finance* 123, 1-24.

Sun, Qian., Wu, Yujun. and Tong, Wilson H. S. 2008. Why Would Chinese Firms List Overseas. *Working paper.*

The Heritage Foundation and The Wall Street Journal. 2012. Index of Economic Freedom World Rankings. Retrieved 10.10.2011. URL: http://www.heritage.org/Index/

Tian, Lihui. and Estrin, Saul. 2007. Debt financing, soft budget constraints, and government ownership. *Economics in Transition* 3, 461-481.

Tolmunen, Pasi. and Torstila, Sami. 2005. Cross-Listings and M&A Activity; Transatlantic Evidence. *Financial Management* Spring, 123-142.

Tomasic, Roman. and Fu, Jian. 2005. Regulation and corporate governance of China's top 100 listed companies: Whither the rule of law? *Research committee on the sociology of law (annual conference)*

Tsui, Mabel. 2010. Corporate Governance in China. *Bond University ePublications.*

Wall Street Pit. 2010. China to allow margin trading and short selling of stocks. Retrieved 20.10.2011. URL: http://wallstreetpit.com/13518-china-to-allow-margin-trading-and-short-selling-of-stocks

Wan, Hanny. 2009. Legg Mason seeks China license to trade Yuan-denominated Stocks. Bloomberg. Retrieved 8.11.2011. URL: http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aM4E27602pNU

World federation of Exchanges. 2011. WFE database - statistics. Retrieved 7.11.2011. URL: http://www.world-exchanges.org/statistics

Yang, Jingjing., Chi, Jing and Young, Martin. 2011. A Review of Corporate Governance in China. *Asian-Pacific Economic Literature, 15-28.*

Appendix 1. Robustness check: Regression results without winsorizing

This table presents the regression results before the independent variables have been winsorized. The table shows coefficients and t-statistics (in brackets). Tobin's Q is the dependent variable and the independent variables are listed on the left. The main focus is on the *Cross-listing or exchange dummy* and it is specified in more detailed below. The used sample and the tested hypotheses are stated at the top of the table. The last two rows on right describe the results of an additional test made to cover the valuation differences between non-cross-listed A-shares and B-shares. The expected signs of the coefficients are listed after the variables. The number of observations and the adjusted R-squared received are presented below the regression coefficients and t-statistics. All the regressions include year fixed effects and standard errors which are adjusted for the heteroscedasticity and within firm clustering. Symbols ***, ** and * indicate statistical significance at the levels of 1%, 5% and 10%.

Variable	expected sign	H1 HK stocks excluding H-shares - A-shares excluding cross-listed		Pure HK stocks - A-shares excluding cross-listed		H2 HK cross-listed shares - A-shares which have cross-listing		H3 Cross-listed A-shares - Non-cross-listed A-shares		H4 HK H-shares - HK stocks excluding H-shares		additional B-shares - A-shares excluding B-shares and cross-listed shares	
dummy value 1:		A-shares		A-shares		A-shares		Cross-listed A-shares		HK excluding H-shares		B-shares	
dummy value 0:		HK stocks		HK stocks		HK cross-listed		Non-cross-listed A-		HK H-shares		A-shares	
		(1)	(6)	(1)	(6)	(1)	(6)	(1)	(6)	(1)	(6)	(1)	(6)
Cross-listing or exchange dumm	+	**0.253**	**0.045**	**0.991 *** **	**0.722 *** **	**0.672 *** **	**0.662 *** **	**0.333 ** **	**0.4 ** **	**0.441 *** **	**0.526 ** **	**-1.284 *** **	**-1.341 *** **
		[0.5]	**[0.08]**	**[6.44]**	**[4.84]**	**[8.92]**	**[8.54]**	**[2.09]**	**[2.33]**	**[2.83]**	**[2.52]**	**[-11.79]**	**[-17.08]**
Sales Growth	+	0	0	0 **	0	0.079	0.04	0 **	0	0.002 *	0.002 *	0 **	0
		[1.22]	[1.2]	[2.26]	[1.46]	[1.08]	[0.47]	[1.97]	[0.74]	[1.66]	[1.73]	[2.39]	[1.19]
LN (Sales)	-	-0.495 ***	-0.49 ***	-0.486 ***	-0.515 ***	-0.03	-0.032	-0.536 ***	-0.58 ***	-0.379 ***	-0.352 ***	-0.502 ***	-0.54 ***
		[-7.24]	[-5.74]	[-10.57]	[-10.9]	[-1.56]	[-1.46]	[-11.08]	[-11.58]	[-3.43]	[-2.57]	[-12.4]	[-12.74]
Industry Median Tobin's Q	+	0.947	1.021	0.492 ***	0.444 ***	0.147 *	0.119 *	0.582 ***	0.523 ***	0.96	1.026	0.653 ***	0.594 ***
		[1.52]	[1.4]	[7.31]	[6.4]	[1.91]	[1.71]	[9.84]	[8.12]	[1.22]	[1.17]	[8.8]	[6.8]
Capex	-		4.281		-0.33		0.048		-0.243		8.181		-0.365
			[1.11]		[-1.01]		[0.15]		[-0.71]		[1.12]		[-1.14]
Cash	+		2.891 ***		2.493 ***		0.432		2.678 ***		2.692 ***		2.688 ***
			[6.22]		[6.9]		[1.58]		[6.76]		[3.5]		[7.54]
Leverage	-		1.135 ***		1.339 ***		0.141		1.312 ***		1.136 ***		1.432 ***
			[5.87]		[3.34]		[0.71]		[3.05]		[6.07]		[4.83]
ROA	+		-0.768		2.512 ***		0.558		2.764 ***		-1.318		2.56 ***
			[-0.84]		[5.32]		[0.94]		[4.83]		[-1.35]		[5.02]
Volatility	-		-0.261		-0.326		0.018		-0.127		-0.116		-0.035
			[-0.62]		[-1.4]		[0.25]		[-0.42]		[-0.21]		[-0.13]
Year Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Observations		19123	16040	12816	10345	801	676	12331	9824	8159	7317	12706	10210
Adj. R²		0.041	0.043	0.295	0.322	0.52	0.512	0.305	0.332	0.021	0.03	0.321	0.362

Appendix 2. Robustness check: More conservative total asset exclusion

This table presents the regression results where all the companies with total assets less than 500 CNY million are excluded. The table shows coefficients and t-statistics (in brackets). Tobin's Q is the dependent variable and the independent variables are listed on the left. The main focus is on the *Cross-listing or exchange dummy* and it is specified in more detailed below. The sample and the tested hypotheses are stated at the top of the table. The last two rows on right describe the results of an additional test made to cover the valuation differences between non-cross-listed A-shares and B-shares. The expected signs of the coefficients are listed after the variables. The number of observations and the adjusted R-squared received are presented below the regression coefficients and t-statistics. All the regressions include year fixed effects and standard errors which are adjusted for the heteroscedasticity and within firm clustering. Symbols ***, ** and * indicate statistical significance at the levels of 1%, 5% and 10%.

Variable	expected sign	H1 HK stocks excluding H-shares - A-shares excluding cross-listed (1)	(6)	H1 Pure HK stocks - A-shares excluding cross-listed (1)	(6)	H2 HK cross-listed shares - A-shares which have cross-listing (1)	(6)	H3 Cross-listed A-shares - Non-cross-listed A-shares (1)	(6)	H4 HK H-shares - HK stocks excluding H-shares (1)	(6)	additional B-shares - A-shares excluding B-shares and cross-listed shares (1)	(6)
dummy value 1:		A-shares		A-shares		A-shares		Cross-listed A-shares		HK excluding H-shares		B-shares	
dummy value 0:		HK stocks		HK stocks		HK cross-listed		Non-cross-listed A-shares		HK H-shares		A-shares	
Cross-listing or exchange dummy	+	0.803 ***	0.923 ***	0.75 ***	0.911 ***	0.673 ***	0.671 ***	-0.088	-0.102	0.603 ***	0.616 ***	-1.201 ***	-1.229 ***
		[15.87]	[19.77]	[6.56]	[8.9]	[8.97]	[8.61]	[-1.06]	[-1.02]	[12.02]	[11.96]	[-26.8]	[-19.91]
Sales Growth	+	0.464 ***	0.207 ***	0.536 ***	0.071	0.131	0.065	0.607 ***	0.061	0.368 ***	0.279 ***	0.591 ***	0.067
		[11.05]	[4.98]	[10.38]	[1.54]	[1.44]	[0.7]	[11.4]	[1.27]	[7.09]	[5.21]	[11.46]	[1.44]
LN (Sales)	-	-0.132 ***	-0.138 ***	-0.245 ***	-0.255 ***	-0.032	-0.03	-0.284 ***	-0.296 ***	0.061 ***	0.044 **	-0.281 ***	-0.292 ***
		[-8.51]	[-8.51]	[-13.72]	[-12.7]	[-1.62]	[-1.38]	[-16.39]	[-15.56]	[3.37]	[2.48]	[-16.68]	[-15.68]
Industry Median Tobin's Q	+	0.317 ***	0.231 ***	0.515 ***	0.359 ***	0.147 *	0.114 *	0.587 ***	0.39 ***	0.063 **	0.052 **	0.538 ***	0.328 ***
		[9.39]	[8.1]	[9.31]	[8.87]	[1.92]	[1.67]	[10.98]	[8]	[2.35]	[1.98]	[11.45]	[7.85]
Capex	-		0.479 **		-0.232		-0.113		-0.387		1.075 ***		-0.434 *
			[2.21]		[-0.97]		[-0.34]		[-1.6]		[3.61]		[-1.81]
Cash	+		1.287 ***		0.94 ***		0.393		0.884 ***		1.599 ***		0.925 ***
			[7.39]		[4.33]		[1.24]		[4.04]		[7.36]		[4.39]
Leverage	-		-0.996 ***		-0.945 ***		0.127		-0.951 ***		-0.383 **		-0.811 ***
			[-9.2]		[-7.79]		[0.58]		[-7.92]		[-2.52]		[-6.98]
ROA	+		4.667 ***		7.909 ***		0.848		8.882 ***		2.065 ***		8.466 ***
			[12.59]		[13.59]		[1.33]		[13.98]		[5.61]		[13.83]
Volatility	-		0.284 ***		0.613 ***		0.028		0.84 ***		0.081		0.901 ***
			[4.07]		[4.42]		[0.38]		[5.01]		[1.16]		[5.81]
Year Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Observations		15811	13401	11657	9543	801	676	11302	9126	5716	5293	11800	9587
Adj. R²		0.291	0.34	0.344	0.412	0.521	0.515	0.349	0.422	0.099	0.147	0.37	0.432

Appendix 3. Robustness check: Tobin's Q replaced by EV/EBITDA

This table presents the regression results where dependent variable is EV/EBITDA (in all other regressions the dependent variable is Tobin's Q). The table shows the coefficients and the t-statistics (in brackets). EV/EBITDA is the dependent variable and the independent variables used are listed on the left. The main focus is on the *Cross-listing or exchange dummy* and it is specified in more detailed below. The sample and the tested hypotheses are stated at the top of the table. The last two rows on right describe the results of an additional test made to cover the valuation differences between the non-cross-listed A-shares and the B-shares. The expected signs of the coefficients are listed after the variables. The number of the observations and the adjusted R-squared received are presented below the regression coefficients and t-statistics. All the regressions include year fixed effects and standard errors which are adjusted for the heteroscedasticity and within firm clustering. Symbols ***, ** and * indicate statistical significance at the levels of 1%, 5% and 10%.

Variable	expected sign	H1 HK stocks excluding H-shares - A-shares excluding cross-listed		Pure HK stocks - A-shares excluding cross-listed		H2 HK cross-listed shares - A-shares which have cross-listing		H3 Cross-listed A-shares - Non-cross-listed A-shares		H4 HK H-shares - HK stocks excluding H-shares		additional B-shares - A-shares excluding B-shares and cross-listed shares	
dummy value 1:		A-shares		A-shares		A-shares		Cross-listed A-shares		HK excluding H-shares		B-shares	
dummy value 0:		HK stocks		HK stocks		HK cross-listed		Non-cross-listed A-		HK H-shares		A-shares	
		(1)	(6)	(1)	(6)	(1)	(6)	(1)	(6)	(1)	(6)	(1)	(6)
Cross-listing or exchange dummy	+	19.203 ***	19.837 ***	16.468 ***	18.104 ***	8.952 ***	7.733 ***	0.948	-0.544	5.535 ***	5.181 ***	-15.703 ***	-16.427 ***
		[30.28]	[28.28]	[9.57]	[10.91]	[3.94]	[3.59]	[0.41]	[-0.22]	[11.44]	[12.14]	[-14.69]	[-13.3]
Sales Growth	+	2.539 ***	0.945 *	3.254 ***	1.362	1.302	-0.73	4.796 ***	2.773 **	1.902 ***	0.634	4.831 ***	3.078 ***
		[4.69]	[1.74]	[3.15]	[1.29]	[0.46]	[-0.32]	[4.23]	[2.31]	[4.27]	[1.39]	[4.46]	[2.67]
LN (Sales)	-	-1.084 ***	-1.751 ***	-3.833 ***	-4.284 ***	-1.688 **	-1.465 **	-4.85 ***	-5.323 ***	1.789 ***	0.885 ***	-4.645 ***	-5.098 ***
		[-4.94]	[-7.01]	[-10.27]	[-9.84]	[-2.19]	[-2.04]	[-12.55]	[-12.03]	[14.79]	[6.69]	[-12.75]	[-12.32]
Industry Median Tobin's Q	+	1.582 ***	1.393 ***	3.64 ***	2.849 ***	1.403	0.786	5.396 ***	3.666 ***	-0.211 *	-0.091	5.103 ***	3.275 ***
		[6.82]	[6.48]	[4.03]	[3.32]	[1.55]	[0.81]	[5.42]	[3.46]	[-1.68]	[-0.73]	[5.31]	[3.21]
Capex	-		-17.867 ***		-24.395 ***		18.06 **		-17.692 ***		-3.059		-19.114 ***
			[-4.72]		[-4.37]		[1.99]		[-2.93]		[-1.13]		[-3.26]
Cash	+		-4.415 *		5.363		-17.033 *		11.19 **		-6.371 ***		12.389 ***
			[-1.91]		[1.2]		[-1.79]		[2.36]		[-4.77]		[2.78]
Leverage	-		-12 ***		-17.826 ***		-7.509		-19.055 ***		2.862 **		-15.875 ***
			[-6.25]		[-6.24]		[-1.16]		[-6.33]		[2.39]		[-5.55]
ROA	+		47.205 ***		62.249 ***		6.967		55.827 ***		30.449 ***		52.665 ***
			[18.45]		[7.25]		[0.5]		[4.33]		[21.15]		[4.46]
Volatility	-		-2.259 ***		0.023		-5		7.026 **		-1.616 ***		9.76 ***
			[-3.31]		[0.01]		[-1.33]		[2.31]		[-2.91]		[3.53]
Year Fixed Effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Observations		16368	14400	10545	8878	824	659	10114	8351	7466	7075	10665	8903
Adj. R²		0.172	0.208	0.122	0.155	0.128	0.11	0.123	0.154	0.094	0.17	0.135	0.163

Appendix 4. Descriptive statistics of the different sample groups

This table describes some key statistics of the sample. Sample has been divided into subgroups to describe them separately. These figures are before winsorizing. All variables are defined in more detailed in Table 5. The table summarizing averages contains also standard errors below the mean.

# Obs.	HONG KONG					SHANGHAI		SHENZHEN	
	ALL	PURE HK COMPANIES	CHINESE COMPANIES	H-SHARES	CROSS-LISTED	ALL	CROSS-LISTED	ALL	CROSS-LISTED
Tobin's Q	8375	860	1640	1010	440	7304	306	6067	71
Sales Growth	8312	851	1742	1088	484	7572	372	6931	101
Capex	8455	859	1699	1040	432	7477	347	8676	109
Cash	8018	839	1473	922	428	7791	373	8838	114
Leverage	8455	859	1699	1040	432	7824	426	8821	108
ROA	8315	849	1745	1090	485	7579	373	6931	101
Volatility	8072	839	1697	1044	477	6415	239	4628	92

75% quartile	HONG KONG					SHANGHAI		SHENZHEN	
	ALL	PURE HK COMPANIES	CHINESE COMPANIES	H-SHARES	CROSS-LISTED	ALL	CROSS-LISTED	ALL	CROSS-LISTED
Tobin's Q	1.62	1.29	1.37	0.95	0.90	2.59	1.78	3.32	1.64
Sales Growth	33.4 %	23.6 %	38.4 %	35.6 %	36.5 %	33.2 %	33.3 %	35.1 %	49.8 %
Capex	7.2 %	5.2 %	10.2 %	10.3 %	12.1 %	9.4 %	11.0 %	10.7 %	11.2 %
Cash	23.0 %	15.9 %	26.5 %	21.5 %	15.9 %	21.8 %	16.1 %	25.6 %	19.6 %
Leverage	29.2 %	28.0 %	30.0 %	32.5 %	36.6 %	40.3 %	36.1 %	38.1 %	36.2 %
ROA	10.4 %	8.9 %	12.0 %	9.6 %	9.6 %	6.9 %	9.0 %	9.6 %	9.6 %
Volatility	72.4 %	65.3 %	61.1 %	62.7 %	63.0 %	56.4 %	53.8 %	57.1 %	53.1 %

Average	HONG KONG					SHANGHAI		SHENZHEN	
	ALL	PURE HK COMPANIES	CHINESE COMPANIES	H-SHARES	CROSS-LISTED	ALL	CROSS-LISTED	ALL	CROSS-LISTED
Tobin's Q	1.88	1.22	1.39	0.83	0.78	2.27	1.58	2.76	1.45
	0.1091	0.0374	0.1010	0.0093	0.0355	0.0262	0.0657	0.0317	0.0795
Sales Growth	166.9 %	66.3 %	209.6 %	40.9 %	25.0 %	163.3 %	21.9 %	65.9 %	31.5 %
	0.4885	0.2430	1.7066	0.0111	0.0090	1.3310	0.0044	0.2264	0.0475
Capex	5.3 %	4.3 %	7.0 %	7.1 %	7.7 %	6.8 %	8.0 %	7.5 %	7.9 %
	0.0008	0.0021	0.0016	0.0020	0.0029	0.0008	0.0019	0.0007	0.0059
Cash	17.1 %	12.2 %	20.1 %	16.2 %	11.3 %	16.3 %	12.1 %	19.8 %	17.6 %
	0.0018	0.0049	0.0042	0.0030	0.0044	0.0014	0.0026	0.0018	0.0283
Leverage	21.0 %	19.9 %	19.4 %	21.5 %	26.2 %	28.5 %	25.2 %	28.7 %	27.7 %
	0.0055	0.0096	0.0044	0.0055	0.0118	0.0026	0.0050	0.0070	0.0125
ROA	1.8 %	2.5 %	7.2 %	5.5 %	6.4 %	4.2 %	6.1 %	5.4 %	5.4 %
	0.0035	0.0087	0.0025	0.0020	0.0026	0.0013	0.0016	0.0097	0.0086
Volatility	52.8 %	50.6 %	38.3 %	42.5 %	45.1 %	45.2 %	44.2 %	46.0 %	41.8 %
	0.0042	0.0109	0.0083	0.0085	0.0205	0.0022	0.0201	0.0026	0.0149

25% quartile	HONG KONG					SHANGHAI		SHENZHEN	
	ALL	PURE HK COMPANIES	CHINESE COMPANIES	H-SHARES	CROSS-LISTED	ALL	CROSS-LISTED	ALL	CROSS-LISTED
Tobin's Q	0.76	0.70	0.69	0.60	0.74	1.29	1.15	1.39	0.96
Sales Growth	-6.6 %	-8.9 %	5.0 %	7.8 %	19.7 %	0.4 %	8.5 %	1.6 %	5.3 %
Capex	0.9 %	0.6 %	2.1 %	2.9 %	6.1 %	2.0 %	3.5 %	2.4 %	3.6 %
Cash	5.8 %	2.9 %	8.6 %	4.2 %	9.2 %	7.9 %	5.0 %	8.5 %	7.6 %
Leverage	3.1 %	4.9 %	3.9 %	12.2 %	24.5 %	14.0 %	10.3 %	10.2 %	17.8 %
ROA	-0.1 %	0.3 %	3.5 %	3.4 %	5.7 %	2.3 %	3.1 %	2.6 %	3.2 %
Volatility	29.4 %	28.9 %	0.0 %	28.7 %	44.7 %	31.7 %	31.0 %	32.8 %	30.6 %

Stdev	HONG KONG					SHANGHAI		SHENZHEN	
	ALL	PURE HK COMPANIES	CHINESE COMPANIES	H-SHARES	CROSS-LISTED	ALL	CROSS-LISTED	ALL	CROSS-LISTED
Tobin's Q	9.98	1.10	4.09	0.29	0.74	2.24	1.15	2.47	0.67
Sales Growth	4453.6 %	709.0 %	7122.8 %	36.7 %	19.7 %	11582.2 %	8.5 %	1884.5 %	47.7 %
Capex	7.0 %	6.2 %	6.6 %	6.4 %	6.1 %	6.8 %	3.5 %	7.0 %	6.1 %
Cash	16.0 %	14.1 %	16.3 %	9.0 %	9.2 %	12.1 %	5.0 %	17.2 %	30.2 %
Leverage	51.0 %	28.2 %	18.0 %	17.6 %	24.5 %	23.4 %	10.3 %	66.0 %	13.0 %
ROA	32.2 %	25.3 %	10.3 %	6.7 %	5.7 %	11.1 %	3.1 %	81.0 %	8.6 %
Volatility	37.5 %	31.7 %	34.0 %	27.6 %	44.7 %	17.3 %	31.0 %	17.4 %	14.3 %

Median	HONG KONG					SHANGHAI		SHENZHEN	
	ALL	PURE HK COMPANIES	CHINESE COMPANIES	H-SHARES	CROSS-LISTED	ALL	CROSS-LISTED	ALL	CROSS-LISTED
Tobin's Q	1.02	0.90	0.90	0.77	0.74	1.75	1.38	2.07	1.32
Sales Growth	12.1 %	5.7 %	20.7 %	18.3 %	19.7 %	15.0 %	19.0 %	16.5 %	21.5 %
Capex	3.1 %	2.1 %	5.3 %	5.4 %	6.1 %	4.8 %	6.8 %	5.5 %	5.8 %
Cash	12.4 %	7.4 %	15.6 %	13.5 %	9.2 %	13.3 %	9.5 %	15.2 %	12.7 %
Leverage	15.0 %	15.3 %	16.9 %	18.6 %	24.5 %	27.1 %	23.0 %	24.3 %	26.7 %
ROA	5.0 %	4.5 %	6.8 %	5.6 %	5.7 %	4.3 %	5.6 %	5.5 %	5.0 %
Volatility	50.5 %	43.8 %	40.7 %	44.3 %	44.7 %	42.0 %	41.6 %	43.6 %	39.3 %

Appendix 5. Regression tables

These tables are the complete regression tables which are utilized to test each of the hypotheses. Each table contains regression results with coefficients and t-statistics (in brackets). Tobin's Q is the dependent variable and the independent variables used are listed at left. The main focus is on the *Cross-listing or exchange dummy* and above each table it is specified in more detailed. In addition, the sample and the tested hypotheses are stated above each of the table. Expected signs of the coefficients are listed after the variables. The number of observations and adjusted R-squared received are presented below the tables. All the regressions include year fixed effects and standard errors which are adjusted for heteroscedasticity and within firm clustering. Symbols ***, ** and * indicate statistical significance at the levels of 1%, 5% and 10%. Each regression table is named to clearly show which hypothesis it tests.

H1 - Relative valuation between the Chinese and the Hong Kong markets

Sample: All Hong Kong shares (excluding H-shares) and A-shares (Shanghai and Shenzhen) excluding cross-listed and B-shares
  Dummy value 1 - A-shares excluding cross-listed and B-shares
  Dummy value 0 - Hong Kong shares excluding H-shares

Variable	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)
Cross-listing or exchange dummy	+	**0.259**	**0.223**	**0.199**	**0.207**	**0.267**	**0.196**
		[0.51]	**[0.44]**	**[0.39]**	**[0.37]**	**[0.53]**	**[0.33]**
Sales Growth	+	0.6 **	0.568 **	0.555 *	0.555 *	0.683 *	0.73 *
		[2.01]	[2.04]	[1.92]	[1.92]	[1.92]	[1.82]
LN (Sales)	-	-0.508 ***	-0.506 ***	-0.498 ***	-0.497 ***	-0.443 ***	-0.465 ***
		[-7]	[-6.6]	[-6.18]	[-6.03]	[-9.87]	[-8.18]
Industry Median Tobin's Q	+	0.942	0.942	0.923	0.923	0.92	1.009
		[1.51]	[1.51]	[1.43]	[1.43]	[1.43]	[1.39]
Capex	-		1.382	1.571	1.579	2.12	2.628
			[1.02]	[1.14]	[1.13]	[1.28]	[1.33]
Cash	+			1.755 ***	1.714 ***	1.957 ***	2.533 ***
				[3.13]	[3.42]	[4.64]	[4.96]
Leverage	-				-0.089	-0.391	-0.286
					[-0.15]	[-0.73]	[-0.46]
ROA	+					-3.017	-3.661
						[-1.04]	[-1.05]
Volatility	-						-0.454
							[-0.79]
Year Fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
# Observations		19121	18893	18586	18586	18559	16039
Adj. R²		0.041	0.04	0.041	0.041	0.042	0.04

H1 - Relative valuation between the Chinese and the Hong Kong markets (2)

Sample: Pure Hong Kong companies and A-shares (from both Shanghai and Shenzhen) excluding cross-listed and B-shares
  Dummy value 1 - A-shares excluding cross-listed and B-shares
  Dummy value 0 - Pure Hong Kong shares

Variable	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)
Cross-listing or exchange dummy	+	**0.974 ***	**0.977 ***	**0.944 ***	**1.072 ***	**0.956 ***	**0.915 ***
		[6.34]	**[6.42]**	**[6.18]**	**[7]**	**[6.76]**	**[6.07]**
Sales Growth	+	0.662 ***	0.657 ***	0.616 ***	0.616 ***	0.328 ***	0.276 ***
		[7.55]	[7.87]	[7.23]	[7.26]	[3.99]	[3.08]
LN (Sales)	-	-0.5 ***	-0.482 ***	-0.478 ***	-0.462 ***	-0.517 ***	-0.535 ***
		[-11.93]	[-12.75]	[-12.37]	[-11.38]	[-12.49]	[-10.62]
Industry Median Tobin's Q	+	0.467 ***	0.476 ***	0.415 ***	0.405 ***	0.392 ***	0.403 ***
		[7.11]	[7.19]	[6.59]	[6.64]	[7.07]	[6.31]
Capex	-		-0.515	-0.412	-0.299	-1.499 ***	-1.064 ***
			[-1.57]	[-1.24]	[-0.88]	[-4.07]	[-2.58]
Cash	+			1.504 ***	0.915 ***	0.366	1.128 ***
				[6.29]	[4.01]	[1.6]	[3.57]
Leverage	-				-1.085 ***	-0.542 **	-0.418
					[-4.84]	[-2.26]	[-1.52]
ROA	+					7.581 ***	7.583 ***
						[10.12]	[9.35]
Volatility	-						0.146
							[0.59]
Year Fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
# Observations		12816	12587	12565	12565	12562	10345
Adj. R²		0.306	0.306	0.314	0.32	0.352	0.326

H2 - Relative valuation between H-shares and the Cross-listed A-shares

Sample: Hong Kong H-Shares that have cross-listing and A-shares that have cross-listing
Dummy value 1 - A-shares which have cross-listing
Dummy value 0 - Cross-listed H-shares

Variable	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)
Cross-listing or exchange dummy	+	**0.673 *****	**0.682 *****	**0.679 *****	**0.679 *****	**0.695 *****	**0.671 *****
		[8.97]	**[9.01]**	**[9]**	**[8.72]**	**[8.84]**	**[8.61]**
Sales Growth	+	0.131	0.142	0.119	0.115	0.047	0.065
		[1.44]	[1.4]	[1.21]	[1.18]	[0.52]	[0.7]
LN (Sales)	-	-0.032	-0.028	-0.025	-0.023	-0.023	-0.03
		[-1.62]	[-1.34]	[-1.19]	[-1.09]	[-1.12]	[-1.38]
Industry Median Tobin's Q	+	0.147 *	0.143 *	0.139 *	0.134 *	0.125 *	0.114 *
		[1.92]	[1.9]	[1.86]	[1.83]	[1.71]	[1.67]
Capex	-		-0.201	-0.107	-0.076	-0.313	-0.113
			[-0.7]	[-0.38]	[-0.26]	[-1.02]	[-0.34]
Cash	+			0.401	0.339	0.291	0.393
				[1.45]	[1.02]	[0.91]	[1.24]
Leverage	-				-0.072	0.026	0.127
					[-0.35]	[0.12]	[0.58]
ROA	+					1.038 *	0.848
						[1.64]	[1.33]
Volatility	-						0.028
							[0.38]
Year Fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
# Observations		801	743	742	738	738	676
Adj. R²		0.521	0.516	0.518	0.516	0.522	0.515

H3 – Cross-listing Premium

Sample: A-shares (Shanghai and Shenzhen) excluding B-shares
Dummy value 1 - Cross-listed A-Shares (Shanghai and Shenzhen)
Dummy value 0 - non-cross-listed A-shares

Variable	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)
Cross-listing or exchange dummy	+	**0.366 ****	**0.326 ****	**0.379 ****	**0.329 ****	**0.36 ****	**0.359 ****
		[2.37]	**[2.22]**	**[2.56]**	**[2.15]**	**[2.31]**	**[2.06]**
Sales Growth	+	0.757 ***	0.753 ***	0.708 ***	0.71 ***	0.303 ***	0.27 ***
		[7.95]	[8.35]	[7.65]	[7.65]	[3.41]	[2.74]
LN (Sales)	-	-0.55 ***	-0.534 ***	-0.53 ***	-0.515 ***	-0.555 ***	-0.592 ***
		[-12.65]	[-13.74]	[-13.4]	[-12.32]	[-13.08]	[-11.3]
Industry Median Tobin's Q	+	0.608 ***	0.62 ***	0.548 ***	0.529 ***	0.487 ***	0.508 ***
		[8.4]	[8.72]	[7.72]	[7.55]	[7.12]	[5.94]
Capex	-		-0.517	-0.383	-0.275	-1.771 ***	-1.293 ***
			[-1.58]	[-1.15]	[-0.81]	[-4.66]	[-2.88]
Cash	+			1.457 ***	0.821 ***	0.086	1.03 ***
				[6.03]	[3.54]	[0.37]	[3.09]
Leverage	-				-1.129 ***	-0.569 **	-0.414
					[-4.99]	[-2.33]	[-1.45]
ROA	+					9.001 ***	8.954 ***
						[9.93]	[8.86]
Volatility	-						0.126
							[0.36]
Year Fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
# Observations		12331	12091	12089	12085	12083	9824
Adj. R²		0.32	0.319	0.327	0.334	0.366	0.342

H4 - Cross-listing discount

Sample: Hong Kong Stock Exchange stocks
  Dummy value 1 - Hong Kong stock excluding H-shares
  Dummy value 0 - H-shares

Variable	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)
Cross-listing or exchange dummy	+	**0.439 *****	**0.532 *****	**0.44 ****	**0.458 ****	**0.556 *****	**0.544 *****
		[2.82]	**[3.25]**	**[2.25]**	**[2.47]**	**[3.48]**	**[3.22]**
Sales Growth	+	0.505	0.455	0.47	0.461	0.718	0.813
		[1.15]	[1.12]	[1.09]	[1.06]	[1.4]	[1.47]
LN (Sales)	-	-0.391 ***	-0.411 ***	-0.405 ***	-0.417 ***	-0.253 ***	-0.281 ***
		[-3.38]	[-3.33]	[-2.95]	[-2.99]	[-3.62]	[-3.18]
Industry Median Tobin's Q	+	0.958	0.96	0.954	0.955	0.932	1.012
		[1.22]	[1.22]	[1.18]	[1.18]	[1.17]	[1.16]
Capex	-		4.402	4.867	4.706	5.871	5.685
			[1.38]	[1.44]	[1.36]	[1.57]	[1.42]
Cash	+			2.054 **	2.576 ***	3.115 ***	3.059 ***
				[2.53]	[2.96]	[3.88]	[3.58]
Leverage	-				1.544	0.662	0.76
					[1.2]	[0.55]	[0.56]
ROA	+					-5.991 **	-6.529 *
						[-1.98]	[-1.77]
Volatility	-						-0.56
							[-0.79]
Year Fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
# Observations		8159	8112	7697	7697	7672	7317
Adj. R²		0.021	0.022	0.022	0.022	0.027	0.027

Additional – Relative valuation of B-shares

Sample: A-shares (Shanghai and Shenzhen) excluding cross-listed
  Dummy value 1 - B-shares (Shanghai and Shenzhen)
  Dummy value 0 - non-cross-listed A-shares

Variable	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)
Cross-listing or exchange dummy	+	**-1.235 *****	**-1.275 *****	**-1.243 *****	**-1.255 *****	**-1.244 *****	**-1.287 *****
		[-11.34]	**[-11.24]**	**[-11.03]**	**[-10.66]**	**[-11.05]**	**[-10.78]**
Sales Growth	+	0.734 ***	0.736 ***	0.698 ***	0.696 ***	0.291 ***	0.255 ***
		[7.92]	[8.35]	[7.75]	[7.72]	[3.4]	[2.69]
LN (Sales)	-	-0.539 ***	-0.524 ***	-0.523 ***	-0.51 ***	-0.549 ***	-0.578 ***
		[-12.7]	[-13.77]	[-13.59]	[-12.53]	[-13.28]	[-11.42]
Industry Median Tobin's Q	+	0.549 ***	0.561 ***	0.486 ***	0.47 ***	0.423 ***	0.433 ***
		[9.44]	[9.72]	[8.43]	[8.2]	[7.78]	[6.83]
Capex	-		-0.632 *	-0.499	-0.406	-1.9 ***	-1.473 ***
			[-1.94]	[-1.5]	[-1.19]	[-4.89]	[-3.23]
Cash	+			1.487 ***	0.984 ***	0.278	1.167 ***
				[6.34]	[4.4]	[1.22]	[3.67]
Leverage	-				-0.887 ***	-0.342	-0.178
					[-3.86]	[-1.38]	[-0.62]
ROA	+					8.864 ***	8.799 ***
						[9.94]	[8.86]
Volatility	-						0.219
							[0.69]
Year Fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
# Observations		12910	12611	12609	12609	12607	10365
Adj. R²		0.326	0.325	0.333	0.338	0.369	0.344