Do Chinese Dual-listed Companies "Return with Glory" in Their Mainland IPOs ?

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Abstract

Dual-listing has become a popular approach for companies to seek funding and international expansion. Typically companies grow big from less developed domestic markets and march into developed markets. However, China, as an emerging market economy has witnessed a wave of Hong Kong-listed companies returning to the mainland for a second IPO. One primary assumption for companies' motivation to return is that these companies are perceived as "Return with glory". The good reputation leads to positive market reactions. This paper focuses on the effect of mainland IPOs for dual-listed Chinese companies, and to provide statistical proof to the general assumption. Using a difference-in-difference method, we derive the results that companies returned for a mainland IPO have received a less negative market response than companies only issue seasoned equity offerings in Hong Kong. Next, an event study illustrates insignificant positive abnormal returns for returned companies, but a significantly negative abnormal return for the ones only raised funds in Hong Kong. The above two parts gave us a unified conclusion: For Hong Kong-listed Chinese companies, a mainland IPO introduces positive market reaction, which motivates more companies to choose a mainland IPO over Hong Kong SEO to meet future funding needs.

Key words: Dual-listing; Market segmentation; Stock return; Event study; Cumulative abnormal return

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Contents

1. Introduction

China, as the world's second largest economy, has witnessed enormous growth in the past two decades. In 2018, Hong Kong was the NO. 1 IPO market, and Mainland China was ranked third worldwide in stock markets' capitalization. More and more researches have been dedicated to the development of China's securities markets.

Back in the 1990s, the Chinese mainland capital market is still in its initial stage. Problems remain in the inefficient market infrastructure, speculative bubbles, and government restrictions. Many enterprises with enormous financing need were attracted by various advantages of developed overseas markets at that time and have chosen to list in the foreign stock exchanges such as New York, London, Frankfurt, and others. After Brilliance Auto entered the American market in 1992, and Tsingtao Beer's successful listing on the Hong Kong Stock Exchange in 1993, a large number of high-quality Chinese companies set out to go public abroad.

Due to the unique economic environment under "One country and two systems", companies that registered in mainland China can raise funds both in H-share market, which is Hong Kong stock exchange and A-share market, which are either Shanghai or Shenzhen stock exchange. The Hong Kong capital market is an international financial centre with well-established institutions and regulations. Also, its language and culture are in line with the mainland financial environment. Therefore, Hong Kong is a hotspot for Chinese companies that seek foreign funds. Since China joined the WTO in 2001, the openness of the capital market and the deepening of reformation accelerated. The connection between Hong Kong and mainland China has further strengthened.

Companies with dual-listing in Hong Kong and Mainland China are a particular group with Chinese characteristics, which is different from the ones dual-listed on overseas markets in London, New York, Frankfurt and such. Because usually companies listed on domestic markets seek overseas listing when their performance is able to catch up to higher standards required by a foreign stock exchange. However, in this paper, we look into a particular route where companies first listed in a developed market, Hong

Kong, and returned to a less developed market, mainland China. Researchers have raised various assumptions on companies' motivation to return.

One popular conception of companies' first listed in Hong Kong and went back to the mainland is that the act is a bad signal for firm performance (Tan & Zhang, 2014). The company may have been experiencing distress or foreseen poor performance, and the decaying performance of the company made raising funds in Hong Kong difficult, so a mainland IPO may release financing constraints (Gong, 2010). Built on IPO first day returns see from the data in the CSMAR database (China Stock Market & Accounting Research Database). It is evident that companies returned to the mainland after listed in Hong Kong generally have successful mainland IPOs. Companies with decaying performance are expecting successful funding in mainland when the idea for a Hong Kong SEO seems painful.

Some scholars raise arguments in a statistical sense and conclude that Chinese companies return to the mainland is purely based on companies' future perspective (Wei, 2014). Other than assumptions on companies performance, the arguments about companies select a less advanced listing location after first listed in a sophisticated capital market also surrounds the topic of reputation may bring the price premium. The fact that listed on Hong Kong means they are companies with good reputation and are solid investment targets (Tan & Zhang, 2014). Looking at the numbers for the companies' return, we saw a wave in 2005. The reason behind the wave is the case that in 2005, China Construction Bank successfully issued H-shares in Hong Kong and China Industrial and Commercial Bank simultaneously listed in Hong Kong and the mainland.

Graph 1: The number of H-share Chinese companies from 1993-2018 (Securities & Futures Commission of Hong Kong website)
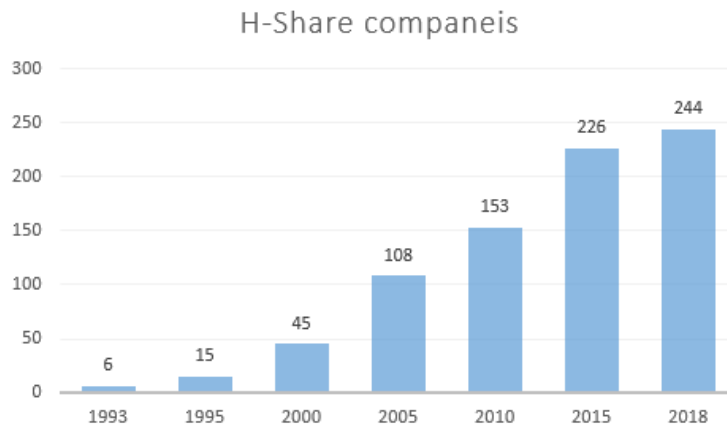
Graph 2: The number of H+A-share companies from 1993-2018 (Securities & Futures Commission of Hong Kong website)
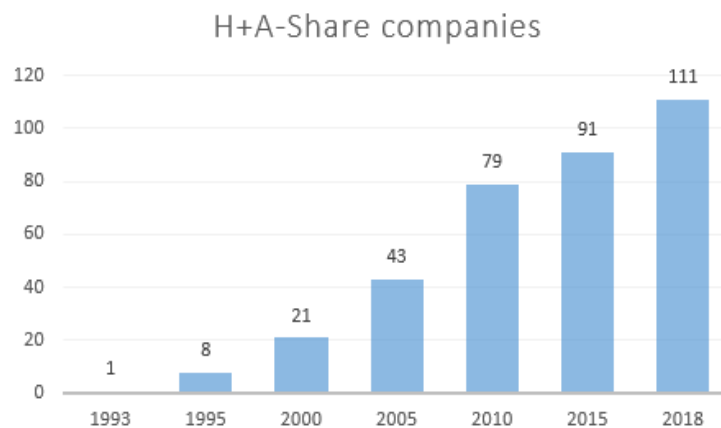
The two state-owned banks are large and renowned. Companies with similar size and history have been endowed with considerable power from governmental support and people's trust. In the next couple of years, more and more giant state-owned companies finalized a Hong Kong IPO. The wave of such companies raising funds in Hong Kong has planted the idea in the public's mind that companies who can do an IPO in Hong Kong are well-regulated, stable and profitable. After that, the eye-catching tag of "Hong Kong-listed" has become a shimmering coat for Chinese companies. To take advantage of the idea, Chinese companies have made reputation seeking the main motive for a first listing on the Hong Kong Stock Exchange (Xie, 2018).

With a positive reputation, many researchers have constructed the motives for companies' return are not only restricted to meet funding needs, but also to take advantage of the fact that they can raise excessive funds. Companies wish to utilize a better reputation to issue shares in domestic markets with inflated prices and favorable terms (Gong, 2010).

So how will reputation brings positive reactions post-funding? Can "Return with glory" be supported by statistical facts? To investigate these questions, we apply two empirical methods, the difference in difference method and event study. The purpose of the difference in difference method is to identify the difference in market reactions between companies returned and the ones have not. We decide on 42 dual-listed companies as the treatment group and 71 companies that only listed in Hong Kong as the control group. By conducting the regression analysis, we take the annual stock return as the dependent variable to represent the company performance. As for the independent variables, we take six key performance indicators and two dummy variables in financing need and listing locations. The result will look into the differences in stock return for two types of companies and demonstrate if the market reaction is positive for companies returned mainland. For the event study, we have the same sets of companies and employ the market model on Hong Kong stock performance to see if the abnormal return is significant for two groups.

By studying market reaction and short-term stock performance, we can verify whether reputation brings positive outcomes for the returned companies, further review motivations for companies' action of a mainland IPO.

The paper is composed of seven sections. Section one presents an introduction to the background, outlines the framework. Section two presents an overview of previous literature and relevant theoretical concepts related to dual-listing in Hong Kong and mainland China. Section three is the methodology part, which specifies the theoretical framework and the data collection process of two empirical methods, i.e. difference in difference method and event study. This is followed by a result section where we conduct and estimate two empirical approaches. Section five will be the analysis of the results we find. Section six applies several diagnostic tests on the difference in difference method to see the robustness of our model, also summarizing the limitations

of the paper. Section seven concludes the paper and raises the significance of our research.

2. Literature Review

2.1 Stock Markets in China

The stock market in China is the third largest worldwide in terms of market capitalization. Because listing places and target investors can be quite different, equity trading in China is much more complicated and has more classes than other international capital markets (Wu, 2008). The most ordinary share classes that Chinese companies offer are A-shares, B-shares, and H-shares.

A-shares are domestic shares offered by companies that registered and listed on mainland China, subscribed and traded in CNY, and can be traded on Shanghai and Shenzhen Stock Exchanges. B-shares are issued by mainland China-based companies and can also be bought and sold on mainland stock exchanges. However, the difference is that A-shares are quoted in CNY, and B-shares are denominated in foreign currency such as U.S. dollars on the Shanghai Stock Exchange and Hong Kong dollars on the Shenzhen Stock Exchange. B-share stocks are more broadly accessible to potential foreign investors (Fang, 2001)

Before 2001, B-shares are merely available to overseas investors. The purpose of the B-share system was to blaze a path to raise external funds for domestic enterprises who are in need of foreign capitals at that time. Around the 1990s, foreign currency reserves were significantly inadequate, so the government constituted B-share markets to intrigue foreign investment into joint stock Chinese companies and broaden channels to take advantage of these overseas investments (Wang, 2018). Since 2001, the mainland government has opened the B-share markets to qualify domestic institutional investors since foreign currency assets held by domestic citizens were increasing (Huang, 2001).

Before 2002, A-shares were only available to mainland investors. As the demand for Chinese equity in the international capital market grows, mainland government relaxed

the restrictions on foreign investment, and A-shares are obtainable to qualified foreign investors who pass through the foreign institutional investors ('QFII') system (Fang, 2001). Though mainland government continues to make efforts to open the A-share market, due to the complex regulation and process, foreign investors still face challenges in approaching A-shares. Similarly, mainland investors also have difficulty purchasing B-shares owing to problems such as currency exchange.

H-shares are issued by Chinese companies which registered in the mainland and listed on the Hong Kong Stock Exchange. H-shares are quoted in Hong Kong dollars. External investors can directly purchase H-shares. But for mainland investors, only qualified institutional investors (QDII system) are capable of investing H-shares before the restrictions were eased in 2007, where individual mainland investors can invest in H-share if the company is also listed in Shanghai Stock exchange.

2.2 Market Segmentation between HK and Mainland China

Securities Market Segmentation is defined as a dual-listed company is able to present more than one stock prices when listed in various stock markets, which violates the "One Price Principle" and reflects risk variations (Solnik, 1974). Researchers also divided market segmentation into three states, which are entirely segmented, mild segmented, and fully integrated (Errunza & Losq, 1985). Some scholars investigated three pairs of dual-listed companies stocks and discovered that there is a relation between stock prices and different capital markets (Froot & Dabora, 1999). Market segmentation can be sub-divided into hard and soft. Stock investment barriers or ownership constraints create the former, and the latter is caused by liquidity diversity, asymmetric information, cultural differences, and investor preferences, etc. (Liu, 2014).

Typically, A-shares will be traded at a premium to H-shares of the same company since A-shares are more liquid. The figure below displays examples for dual-listed companies, where SH refers to the Shanghai Stock Exchange, SZ refers to the Shenzhen Stock Exchange, and HK refers to the Hong Kong Stock Exchange. As of April 2019, there are 111 companies dual-listed and AH price premium exists with no exception. Generally, H-price is lower than A-price for the same company, which is called "H-

share price discount" (Wei, 2003). According to the Hang Seng Stock Connect China AH Premium Index, the common range for A-H price premium is 10% to 15%.

Graph 3: One-year Hang Seng Stock Connect China AH Premium Index

Looking deeper into the AH price premium, the primary factors that lead to H-share price discount are stock liquidity, industry factors, demand elasticity, and risk appetites (Meng & Zhang, 2009).

First, liquidity states the degree to which a commodity or security can be rapidly and effectively traded on the market at a reasonable price. Liquidity is the most influential factor that leads to AH price premium (Chen et al., 2001). On a comparable liquid market, securities can be bought or sold with lower transaction costs, but investors need to pay higher costs in a relatively illiquid market, so they expect a higher return in order to compensate the relatively higher costs. (Wu, 2008). A-share is more liquid because of two reasons. First, due to restrictions in volume and currency change, mainland investors will go for A-shares as their first choices, while investors in Hong Kong have more choices in varieties of companies and share classes. In this sense, A-shares are more liquid. The second remains in the investors' attitude. Mainland investors have more speculative and herding behavior. The constant trading also provides better liquidity. Thus, H-price is lower than A-price (Zhang, 2016).

Second, demand-price elasticity measures the reaction of the commodity demand for its price changes in a certain period (Xue, 2018). Higher demand elasticity often refers to that customers are more sensitive and responsive to price fluctuations (Zhang, 2016). Hong Kong stock market is more advanced and mature than mainland markets, and it

owns more investment objects that investors can invest among H-shares, B-shares, and red chips (Chinese companies incorporated outside of China but listed in Hong Kong), etc., meaning that quite a few substitutes exist for H-shares leading to higher demand elasticity (Yuan, 2008). On A-share market, most investors are only qualified to purchase A-shares and come across restrictions to invest in additional share classes (Stulz & Wasserfallen, 1995). In addition to investment class restrictions, speculations and herd effect also give A-shares higher value (Zhao & Zhang, 2004). Investment channel choices affect market demand elasticity, and demand elasticity affects acceptable price levels. As a result of lower demand elasticity in A-share market and higher demand elasticity in the H-share market, A-share investors can accept a comparatively higher price, but owing to diversified investment approaches (Wang, 2018), the H-share investors have lower acceptable price levels.

Third, risk preference difference means that different investors' groups have different risk appetites. Therefore, investors have different requirements on risk premium compensations. Risk preference difference is caused primarily by investor structure difference (Hietala & Pekka, 1989). Take Shenzhen Stock Market as an example, as of 2018, individual investors in the Shenzhen stock market account for more than 90% of total investors according to the published data on the website. In contrast, institutional investors are the primary force on the Hong Kong security market that make up 45.9% of total market capitalization, and individual investors only hold 7.6% according to Hong Kong Securities & Futures Commission. In general, investors on the mature H-share market are more logical and they usually emphasis on the long-term profitability of companies, so H-share investors are inclined to invest in robust and steady assets (Lu & Zhou, 2018). On the other end of the table, mainland investors lack financial knowledge and investment skills, which cause them to choose short-term returns from stock price fluctuations over long-term benefits and future potential (Tan & Zhang, 2014). Their investment decisions possess randomness and blindness, leading to herd behavior on stock markets (Wei, 2003). When a company is pictured as "worth investing", no matter through media or word-of-mouth effect, investors are eager to purchase. Consequently, investors in A-share market have higher risk preference to accept a higher stock price.

Market segmentation between the mainland and Hong Kong has caused differences in multiple areas, from stock performance to financial reports and investor perceptions (Xue, 2018). To narrow down the effect of market segmentation, we take the ratio form of our data. For example, instead of operating profit, we use profit margin; also using the net amount raised over company value to demonstrate the size of an IPO instead of directly taking the amount of fund raised.

2.3 Dual-listing

2.3.1 Motives for Initial IPO in Hong Kong

In 2018, Hong Kong walked 125 companies down the path of their successful IPOs. With a stunning amount of $36.5 billion, Hong Kong reclaimed the global IPO crown from New York. The market capitalization of the Hong Kong securities market was $29.9 trillion at the end of 2018 and reached $34.3 trillion in May 2019. The unique value proposition as China's international financial centre makes Hong Kong the country's vital link to connect with global capital markets and plays a pivotal role in the mainland's economic development. When Chinese companies accomplish successful IPOs in Hong Kong, not only their funding needs were met, but also the invisible perks on a company's reputation and governance set the tone for future success when they decided to return for a mainland IPO (Huang, 2016).

Before 2000, capital markets in mainland China were relatively backward and immature. Large companies were worried about incomplete policies and regulations. Moreover, companies with ambitious funding need worried that the capacity of mainland stock markets cannot catch up to their full potential (Cao, 2016). In comparison, the economy of Hong Kong was more advanced and sophisticated around the same time, especially the reunification of Hong Kong with China in 1997 created much closer ties between these two capital markets as well.

To a Chinese company, three main advantages of the Hong Kong stock market have made it rather attractive: Advanced capital market, short time to market, and policy reforms (Xie, 2018).

First, as a developed market, Hong Kong provides mainland companies with an open environment to raise substantial capital (Xie, 2018). Hong Kong is an efficient, large capacity and comprehensive financing market. It is an ideal financing place not only for large, state-owned enterprises but also for small, medium and private enterprises for its clear listing procedures. Hong Kong has listing sectors such as Growth Enterprise Market and Mainboard Market suited for companies under different sizes and risk levels (Miller, 1999). Unlike most investors in the mainland markets are domestic, the Hong Kong capital market has a robust foundation of worldwide investors, and shares are traded in terms of Hong Kong dollar, which is more convertible than Chinese yuan. Companies could enter the international refinancing platform with a more convenient approach to refinancing (Yi, 2018).

Second, the mainland stock markets apply approval-based IPO system, which refers to companies not only need to disclose company information and go through a series of stringent procedures to receive approval from securities regulator (Gong, 2010). In contrast, the Hong Kong security market adopts a registration-based IPO system. The difference between approval-based IPO system and registration-based IPO system is that under the registration-based IPO system, instead of regulators making judgments of corporate prospects and profitability, the issuer and the intermediary agency will be responsible for the truthfulness and integrity of information disclosure, indicating complete marketization (Fang, 2001).

For Chinese enterprises registered in the mainland, A-share market may seem a solid choice to go public, but the strict mainland IPO approval system alienates certain companies (Xie, 2018). In comparison with mainland markets, the Hong Kong IPO market has less governmental restrictions and more transparent standards. Taking 51 Credit Card Inc. (02051.HK) as an example, it only took less than 4 months to issue IPO in Hong Kong. But take Hua Yi Electric (600290. SH) who wish to list in the mainland as an example, it took 16 months from applying to successfully listing on Shanghai Stock Exchange. Hence, the shorter time required for an IPO to be finalized is one of the motives that companies chose Hong Kong.

Third, the mainland government continues to launch policies to encourage companies from the mainland to list in Hong Kong, as a means of catching up with the

globalization trend. Notably, there was a flood of Hong Kong IPOs in 2005. This was because the premier of China, Jiabao Wen, started to reform the State-owned Asset Management System. One of the "Five-Year Economic Goal" was to establish at least 30-50 Chinese enterprises with internationally competitive ability, which increased the number of Hong Kong-listed companies. According to the Hong Stock Exchange website, the number of H-share companies rose from 69 in 2004 to 141 in 2009.

The Hong Kong Stock Exchange recently published a new regime of listing rules to attract companies proceeding IPOs in Hong Kong. On 24th April 2018, the regime *Hong Kong Stock Exchange Listing Rules* added two new chapters that attracted huge attention: (1) Permitting weighted voting right system for listings in Hong Kong; (2) Allowing pre-profit biotech companies which do not satisfy the financial eligibility criteria before to continue an IPO proceeding in Hong Kong.

Allowing weighted voting right is catching more global attention. Weighted voting right refers to the capital structure of an enterprise having two share classes of common stock with unequal voting rights, which are also called AB share model. Specifically, a typical form of the AB share model is that outside investors holding Class A shares have one vote per share while founders holding Class B shares will carry N votes per share. This system gives management of a company more control on the board (Lu, 2018). Thus, founders or management of innovative and emerging companies have more incentives to seek public fundings in Hong Kong in order to enhance their strength and stabilize company governance even after introducing large institutional investors (Lau, 2018). Accepting pre-profit biotech companies will no doubt facilitate the listing of companies from emerging and innovative sectors (Yi, 2018).

All in all, compared with the domestic market with questioning ability in absorbing massive IPOs, the main incentive for Chinese companies went listing in Hong Kong since 1993 is that H-share market enables companies to take advantage of a more transparent financial reporting system, more regulated governance environment, and higher legal standards in the developed capital market (Huang, 2016). The strict rules that companies obeyed when listing on the more advanced Hong Kong stock exchange improve corporate governance and give companies the reputation of being a good company worth investing.

2.3.2 Dual-listing in Mainland

Under the international integration of capital markets, dual listings are becoming a popular business strategy in expanding opportunities (Pagano et al., 2002). The general route of dual-listing is to first list in a less developed market place and then goes to a developed location (Wang, 2013). For example, companies in developing countries wish to issue an IPO in advanced capital markets such as New York, London, Frankfurt, etc. Companies can improve corporate governance and boost their international reputation (Cao, 2016). However, this paper concentrates on a particular route that companies issued initial public offerings in a sophisticated market, and then offered second IPOs in a less developed exchange. We shall mainly analyze motives for Hong Kong-listed companies to return to mainland China for a second IPO.

First, the Hong Kong security market has stringent regulations in order to go public, companies listed in Hong Kong need to apply to the China Securities Regulatory Commission to carry out secondary offerings; thus, the timing can be dragging along and causing the SEO to be far more expensive than expected (Gong, 2010). Even if companies have listed in Hong Kong, they still face considerable costs to keep up the performance and attract more investors. If they go back to the mainland, due to the already regulated financial positions, companies normally need shorter time for an IPO. Also, it is relatively easier to attract investors with good reputations of "Return with Glory". (Tan, 2016).

Second, supervisions and regulations in the mainland have improved immensely in the past decade. The mainland government successively enacted a series of policies such as *Interim Provisions on the Management of the Issuing and Trading of Stocks* and *Interim Measures for the Management of Equity Investment Funds* (From Ministry of Finance Website) all have improved the efficiency of mainland security markets, standardized market operations, and increased supervision. The policy issued at the same time, such as Shanghai-Hong Kong Stock Connect also opens the doors to encourage the returning of H-shared corporations and affords a favorable law environment (Wei, 2014).

Shanghai-Hong Kong Stock Connect and Shenzhen-Hong Kong Stock Exchange both are cross-boundary investment channels that connect two mainland stock exchanges and the HKEx. Under the scheme, investors in each market can purchase appropriate shares on the other market through their own local security companies or brokers. By the second quarter of 2016, the total transaction volume of SH-HKEx and SZ-HKEx was up to 11.67 trillion CNY (Shanghai Stock Exchange website & Shenzhen Stock Exchange website).

Moreover, the program enables investors to share the benefits of economic development in each market. *Report on the Work of the Government*, which is a report that specifies plans on economic and social undertakings for the following year, stated in 2016 that the mainland government would further expand the aggregate quotas and investment ranges to satisfy investors' diversified cross-boundary investments and risk management requirements. On the other hand, the scheme also helps to promote the openness and reformation of mainland capital markets as well as learn the successful experience from the Hong Kong market for the sake of appealing to more overseas capital into A-share market (Tan, 2016).

Third, they can benefit from "Return with Glory" (Ai, 2009). The rapid growth of Chinese economy contributes to most of the industries, especially large state-owned enterprises such as Petro-China in energy industries, China Mobile in communication industries and ICBC in financial sectors, etc., generates huge funding needs, thereby they require substantial funds to expand their business and capital scale. The behavior of going back to the mainland can be seen as "Return with glory", which means that a lot of mainland investors might go for these companies due to the ingrained conception that companies listed in Hong Kong are stable, profitable and reputational (Wei, 2014). Undoubtedly, as one of the sophisticated emerging market countries, mainland China is growing into a competitive market to allow dual-listed companies in accommodating both foreign and domestic investment (Zhou & Ying, 2019).

The development of security markets is highly associated with the macro-economy. Since 1992, the average economic growth of China is up to 10.26%. Since 2006, A-share market has started to thrive. By 2007, the total financing amount in mainland security markets hit record levels and reached 868 billion CNY. The data is collected

from the official website of the National Bureau of Statistics of China. Accordingly, A-share market is no longer the initial stage back in the 90s, it has the potential to bear returning H-share companies and provide a pleasant environment to H-share companies to raise initial public offering in mainland stock exchanges (Ma, 2017).

Last, policies support quality companies to return. During 1993-1998, the government chose 38 companies to go public in Hong Kong and compelled 18 of them to realize H+A dual listings before 1999 (Tan, 2016). The government merely utilized these "Standardized Joint-stock Pilot Enterprises" to act an exemplary role for Chinese companies. China was short of experience and knowledge in the development of securities markets at that time, and the government hereby wish these companies would bring some pattern and lessons for Chinese companies to learn (Tan, 2016). It is fair to state that the motive of returning A-share market has many factors related to government interventions (Liu, 2014). Therefore, ever since the initial stage of companies' dual listing, the government has been playing an essential role. On the fourth session of Tenth National People's Congress in March 2006, many scholars stipulated and criticized that so many large companies chose to list abroad are not beneficial for cultivating the domestic capital markets. The government subsequently set policies to appeal and encourage foreign-listed companies to come back to the mainland. H-shared companies actively responded to the government's call to dual-listing in mainland China.

This section first introduced the principal share classes of Chinese stock markets to give readers an insight to better understand the capital market system in China. After that, we analyzed the A-H price premium phenomenon under market segmentation. Then we discussed the incentives of Chinese companies to first seek IPO in Hong Kong and the motivations of returning to the mainland. In the next section, we will use two empirical methods to look deeper into the most widespread assumption of companies' returning for mainland IPOs, which are the Difference-in-difference method and an event study. With results in market reaction and short-term stock performance, we will be able to judge the conception with statistical proof.

3. Methodology

3.1 Theoretical Framework

3.1.1 Difference in difference

The difference-in-difference technique is also known as the "controlled before-and-after study". It is typically used to estimate the effect of a specific intervention or treatment, for example, a passage of a law. To see the impact of a treatment, we would like to know the difference between a group in which it received the treatment and the group that has not. In general, the difference-in-difference method requires a dummy variable for the treatment. To estimate the effect of treatment, we look into how time-varying covariates affect the outcome.

Under the context of this paper, the outcome is companies' stock performance, and the treatment is their decision on where to raise further funds -- Do they stick with the Hong Kong stock market or turn to the mainland for an IPO? The treatment group is the 42 companies that have chosen a mainland IPO for funding, while the untreated are the ones who did all the further financing only in Hong Kong. To allow the treatment dummy to purely capture the dual-listing effect from the market, we take fundamental company performance indicators like profitability, liquidity, leverage and others as control variables, also running the equation under cross-sectional and period fixed effects. The aim is to interpret the coefficient for the treatment. The sign and significance of the coefficient will catch the difference in market reaction between returned companies and companies only seek funds in Hong Kong.

By studying a treatment effect, we normally would reach certain conclusions on the causality between the treatment and results. However, here, we cannot derive a definite conclusion but only take reference from the results. Because the decision to raise more funds, regardless through IPOs or SEOs, is management decision. Management decisions are not exogenous and cannot be interpreted with certainty.

3.1.2 Event Study

Event study is a statistical method that measures the impact of an economic event on the market or the firm value. Economic events include listing announcements, M&A, fiscal or monetary policy changes, etc. Event study assumes the market is rational and security prices will respond immediately after a commercial activity taking place. Here, the event is companies listing on the mainland or raising funds in Hong Kong. This paper applies an event study on two groups, first group is 42 dual-listed companies, and second group is 71 solely-HK listed companies. Here, we take the perspective of existing Hong Kong stock holders, short-term stock performance refers to companies' stock returns in the Hong Kong market. The objective is to measure how these two events affect abnormal returns.

According to the closing price released on the Hong Kong Stock Exchange website, we calculate the market return based on the HSCEI index and the daily log stock return for total 113 companies.

Event date refers to the date that the market or firm receives the signal that the event is taking place, also when the market has an immediate reaction to companies' actions. This paper uses announcement dates of the IPOs and SEOs as event days, denote as t=0.

The event window is set to 5 days before and after the announcement, due to the stock price normally reacts promptly on big decisions. If the event window is too long, it might be influenced by other unnecessary factors. The estimation window is 125 days before the event window. Taking trading days instead of calendar days, we change the dates for the event window to be (-5, +5) and the estimation window to be (-130, -6).

Next, we use the market model to estimate the expected return and the abnormal return. With the market return, Hang Seng China Enterprises Index (HSCEI) as the explanatory variable, individual stock returns as the dependent variable, we run the regression using Ordinary Least Squares:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad\qquad (Eq.1)$$

R_{it} : Daily return of the i:th company at time t

R_{mt} : Daily return of market index at time t

α_i , β_i : Parameters in estimating expected return

We regress stock prices between (-130,-6) to derive estimated α_i and β_i. With estimated parameters, we feed the regression with market return in the event window. The results are the expected return. If the event did not happen, expected returns are considered as normal returns. The Abnormal returns (AR_{it}) are actual securities returns subtracting expected returns.

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}) \qquad\qquad (Eq.\ 2)$$

The cumulative abnormal return (CAR) of company i in the event window is:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it} \qquad\qquad (Eq.\ 3)$$

And the cumulative average abnormal return for N companies is:

$$CAAR(t_1, t_2) = \frac{1}{N} \sum_{i=1}^{N} CAR_i(t_1, t_2) \qquad\qquad (Eq.4)$$

We take the CAR to investigate how listing information will influence stock returns, thus reflecting investors' reaction.

Last, we test the significance level of CAR on a 95% confidence level. First, the significance of CAR of the companies returned to the mainland will tell us how the subsequent stock return reacts to dual-listing decisions. Second, the significance of companies only did SEOs in Hong Kong shows how subsequent stock return changes with a seasoned equity offering. Third, we take the difference between the CAR of the above two samples and see if they are significantly different to enhance the effect of the events.

3.2 Data Collection

In order to derive the required data of Chinese companies, we look into two databases, which are Wind and CSMAR. CSMAR and Wind are financial terminals used by 90% of financial institutions. Because both of them do not contain the data of the H-share market in Hong Kong before 2003, so data for all companies in this paper will commence from 2003. Since China's accounting standards did not require disclosure of cash flow statements before 1998, so companies listed before 1998 will be excluded. For data on companies' performance, we adopted an eight-year annual data, from 2010-12-31 to 2018-12-31.

In this paper, the currency for all data is uniformly converted into CNY. The US dollar and Hong Kong dollar exchange rates are all drawn from the Bank of China's official website.

As of April 2019, there are 111 companies dual-listed both on the Hong Kong stock exchange and mainland Shanghai/Shenzhen stock exchange (Shanghai Stock Exchange website & Shenzhen Stock Exchange website). The purpose is to look into the popular route of listing in Hong Kong and returning to the Mainland, whether the decision to return is motivated by "Return with glory". The decision on the location for further financing is a choice for companies already listed in Hong Kong in this context. Therefore, this paper excludes 21 companies went public on the mainland first before going to Hong Kong and 18 companies listed in Hong Kong and mainland simultaneously (announcing at the same time). Also, considering financial institutions, including security companies, state-owned banks, and insurance companies have very different funding patterns, regulatory patterns, and profit models from other entities, we hereby exclude 12 financial institutions. The paper eventually takes 42 companies that first listed on Hong Kong and then returned to the mainland as the first data set, along with two dates for the announcement of an IPO in Hong Kong and the mainland.

After removing companies listed in Hong Kong before 1998, due to the change in if IPO requires cash flow disclosure mentioned before, there are in total 244 companies that are from the mainland and listed on the Hong Kong Stock Exchange. Among the 244 companies, 111 companies are dual-listed on the mainland and Hong Kong, which

leaves us 133 companies. All financial institutions are dual-listed, so when we excluding 111 firms that dual-listed, we automatically excluded the financial institutions. Among the 133, 31 companies have had their first IPO between 1997 and 2003 and 31 companies have records in SEOs at all. Therefore we are left with 71 companies only listed in Hong Kong in the second data set as the control group.

All 113 companies, 42 companies dual-listed companies and 71 solely Hong Kong-listed companies, all have successful SEOs in Hong Kong and has recorded complete daily stock price from 2003/01/01 to 2019/05/17. Here, we collect companies' daily stock closing price starting from 2003. Next, we use the index return to represent market conditions. The index we have taken is the Hong Kong Hang Seng China Enterprises Index (HSCEI).

4. Results

4.1 Performance Variables

To measure how the stock market reacts upon companies' financing behaviors, we wish to use annual stock returns published in the database. However, for mainland stock markets, the published figures in CSMAR automatically contain dividend reinvestment, which is not the case for stocks only listed in Hong Kong. We instead obtained the closing price for each year and calculated the yearly log return.

In terms of choosing independent variables to reflect companies' performance, we refer to previous research and select six variables to reflect six dimensions that will take effect on stock performance. The six dimensions are the company's size, cash flow, liquidity level, risk management, profitability, and growth potential (Tan, 2014). Data of mainland companies is derived from Wind database, and data of Hong Kong-listed companies is from CSMAR database. Due to the lack of regulation in China's securities markets, Tobin's Q is not a satisfactory substitute for corporate growth opportunities. This paper replaces Tobin's Q with the revenue growth rate. Therefore, we chose log(asset), operating free cash flow/revenue, current ratio, financial leverage, operating

profit margin, and revenue growth as performance variables for 42 dual-listed companies and 71 Hong Kong-listed companies from 2010-12-31 to 2018-12-31.

Table 1: Variables in the regression

Stock Return	Performance	Annual Stock Return
Log(Asset)	Size	Log(Asset)
Current Ratio	Liquidity	Current Asset / Current Liability
Profit Margin	Profitability	Operating Profit / Revenue
Revenue Growth	Potential	Change of Revenue / Previous Period Revenue
Leverage	Risk	Debt / Equity
CF /Revenue	Cash Flow	Operating Cash Flow / Revenue
Financing	Financing need	Financing=1 when sizable SEO/IPO; Financing=0 otherwise
Dual	Date for IPO	Treatment=1 from the day of dual-listing; Treatment=0 otherwise

Table 2: Descriptive statistics of variables

	Mean	Median	Standard Deviation	Variance	Min	Max	Count
Return	0,032	0,031	0,319	0,102	-1,239	1,554	772
Log(Asset)	9,787	9,628	0,934	0,872	6,959	11,911	772
Current Ratio	2,203	1,662	1,524	2,322	0,582	7,732	772
Profit Margin	0,246	0,088	2,958	8,748	-0,549	0,677	772
Revenue Growth	0,150	-0,051	1,104	1,218	-0,497	3,080	772
Leverage	1,987	1,609	1,463	2,140	0,115	8,760	772
Operating Cash Flow / Revenue	0,118	0,112	1,283	1,645	-0,343	2,784	772

For mainland IPOs, we first collect the data for companies' A-share IPO announcement dates and the amount raised on the day of the IPO, then find the market value of the company before listings.

For SEOs on the Hong Kong stock exchange, we exclude various forms of an SEO and only retain the data for issuing new shares as a valid SEO, so to make it more comparable to an IPO. We then consider the time for a company to do SEOs and only choose the very first SEO. For example, Tong Ren Tang (01666.HK) has recorded three SEOs in Hong Kong, occurring in 2010-06-21, 2011-03-17, and 2013-09-06. For the 2011 SEO, it is a right issue offering to the existing shareholders, when the rest are new shares issued. Here, we only consider the new shares issued. We will then face two SEOs (2010-06-21 and 2013-09-06). The opportunity is given to the management in 2010, whether to raise more funds through an SEO in Hong Kong or return to the mainland for an IPO. Therefore, we take account of 2010-06-21 as the date for SEO, with the purpose that it is more comparable to an IPO in the above context.

4.2 Dummy Variables

In the difference in difference method, we wish to see the difference in stock performance between dual-listed companies and solely Hong Kong-listed companies. To begin with, we construct the dummy variable "Financing" to capture the market reaction when an SEO or IPO happens, and then we build the dummy variable "Dual" to capture the treatment effect.

The dummy "Dual" is used to distinguish the returned companies from the companies that never returned. When companies choose a mainland IPO as the funding approach, the dummy "Dual" takes the value 1 from the year the dual-listed companies returned. Companies never returned always have "Dual=0"; companies that dual-listed have "Dual=0" in the years before their mainland IPOs and "Dual=1" from the year of their mainland IPOs.

The tricky part is to see how the market reacts to the act of an SEO or IPO. To find the effect on the market, we control for performance indicators, which were produced in

the previous part. However, in this particular route for dual-listing, companies' motives to raise fund also matter. Assuming every single Chinese company listed on the Hong Kong Stock Exchange needs to raise extra funds at a specific time. And to be able to reach the expected amount, the management was given the possibility to go for an SEO in Hong Kong or to go for an IPO to the Shanghai or Shenzhen Stock Exchange. According to previous researches, if the company has already experienced distress or foreseeing poor performance for various reasons, then it is hard to attract more funds on the existing stock market (Ma, 2017). However, going back to the mainland with the reputation of "Return with glory", it is relatively easier to raise the expected amount. Here, we also introduce a new control variable "Financing" as a control variable for financing need.

To quantify the financing need, we construct a threshold. The threshold will kick out small-sized financing and only remain sizeable SEOs and IPOs. When an SEO is sizable enough to be compared with an IPO, we consider the financing need is met. Dummy variable of "Financing" will be switched on from the year with a sizeable SEO. The same thing with IPO, if an IPO is deemed as sizeable enough to meet financing needs, the "Financing" will be switched on. If not, then the dummy will be zero.

For the 42 dual-listed companies, several companies have already done a sizable SEO before returning. Theoretically, these companies had the opportunity to choose but passed on the chance of going back for an IPO, and decided to do it in later years, or maybe never return. For these companies, the need for a sizable fund has presented before the IPO. Therefore, the "Financing" dummy is switched on from the first time it has a sizable SEO in Hong Kong while the "Dual" dummy is switched on when it actually returns.

Looking at graph 4 shown below, Shanghai Fosun Pharmaceutical Group Co Ltd (600196.SH), which belongs to Firm 1 in the above graph that did the mainland IPO first, and Hong Kong SEO later. It went IPO in Hong Kong in 2010. Its first sizeable SEO in Hong Kong occurred in 2015, but the financing need is already satisfied when it went for a mainland IPO in 2012. Therefore, the dummy of "Financing" is switched from 0 to 1 since 2012. As for Zhejiang Shibao Co Ltd (002703.SZ), which belongs to Firm 2, did its Hong Kong SEO first in 2008, then its mainland IPO later in 2012. Its

first sizeable SEO or IPO occurred in 2008, so the dummy for "Financing" switched on from 2008. The treatment is received when it returned, which means, the dummy "Dual" will turn to 1 from 2012 onward.

The 71 companies only listed in Hong Kong represents the third type of firms in the graph. When the amount raised in an SEO is equivalent to a mainland IPO, they should be able to choose between an SEO and a dual-listing. From the year the choice is presented, the dummy "Financing" is switched on, and "Financing" takes the value of 1. The dummy of "Dual" remains 0.

Graph 4: Dummy variables for three types of companies
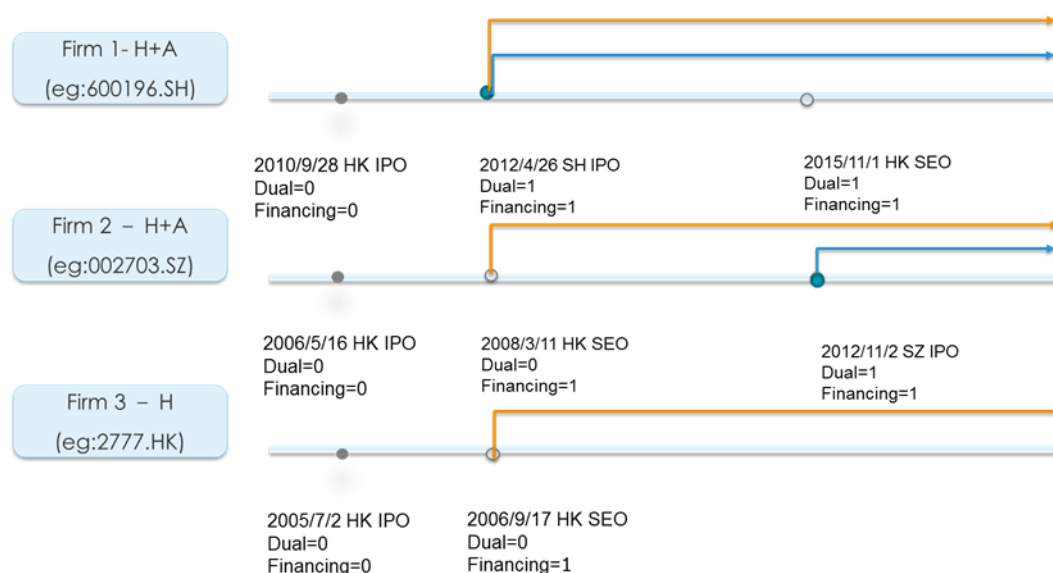
Now, we construct the threshold. To come to a fair threshold, we need to look into the laws and regulations of the Hong Kong stock exchange and Shanghai stock exchange.

In mainland China, the securities law has set the lower limit level on the number of shares issued by A-share IPOs: if the total share capital is less than 400 million shares, the newly issued shares should be at least 25% of the total share capital; if more than 400 million shares, the newly issued shares must be at least 10% of the total. In reality, companies always issue new shares based on the minimum number. The supply of funds is invariant in a short period, while the minimum issuance can minimize the dilution of equity. However, since the shares issued in the mainland always have price premiums, the number of new shares issued isn't representative in measuring the size

of the financing. Consequently, we use the ratio of the net amount raised on the IPO day over the market value before the IPO announcement date as a measurement for the size of the IPO. Taking the median for 42 companies, we have 9.63% as the threshold.

Now to compare the size of an SEO to the threshold 9.63%, we can filter out the smaller SEOs. However, instead of comparing with the ratio of the amount raised in an SEO over companies' values, like how we define a sizeable IPO, we use the ratio of the number of newly issued shares over companies' pre-issue shares number as the size for an SEO instead. It is a better measurement for SEO due to the difference in regulation before two stock markets.

Requirements, in order to issue a Hong Kong SEO contain some general terms. For instance: The weighted average return on equity of the most recent three fiscal years is not less than 10% on average; The number of funds raised by additional issuance of new shares shall not exceed the audited net asset value; The listed company and its directors have not been publicly criticized by the China Securities Regulatory Commission etc. The part worth mentioning is: If the number of new shares exceeds 20% of the total shares of the company, the additional issuance proposal must be approved at the general meeting by more than half of the shareholders.

With an upper limit set to keep procedures easy, many companies quantify the fund size not with the amount, but with the number of new shares issued. For a fair representation, we also take the ratio of new shares issued in an SEO/companies' pre-issue shares number to compare with the threshold of 9.63%. When the size of an IPO or size of an SEO exceeds 9.63%, the dummy "Financing" turns one from that year.

4.3 Regression

In order to obtain the market reaction of companies' decisions of whether they chose to a dual listing, we regress the six performance indicators and two dummies on the annual stock return and focus on the coefficient of the dummy "Dual". The regression is the following:

$$Performance_{(it)} = \alpha_i + \mu_t + \beta_1 \, Financing_{(it)} + \beta_2 \, Dual_{(it)} + \beta_3 \, log(Asset)_{(it)} +$$
$$\beta_4 \, Current \, Ratio_{(it)} + \beta_5 \, Profit \, Margin_{(it)} + \beta_6 \, Leverage_{(it)} +$$
$$\beta_7 \, Revenue \, Growth_{(it)} + \beta_8 \, Operating \, cash \, flow/Revenue_{(it)} + \varepsilon_{(it)}$$

(Eq.5)

α_i: *Cross-sectional fixed effect, adding one intercept per company*

μ_t: *Period fixed effect, adding one intercept per date*

β_1: *Performance effect post offering (IPO or SEO)*

β_2: *The difference in post-offering performance between mainland IPOs and Hong Kong SEOs*

β_3: *Coefficient for company size*

β_4: *Coefficient for liquidity*

β_5: *Coefficient for profitability*

β_6: *Coefficient for leverage*

β_7: *Coefficient for growth*

β_8: *Coefficient for cash flow*

5. Analysis

5.1 Difference in difference

After regress control variables and treatment variables on the stock return, we obtain the following results:

Table 3: Regression results - difference in difference

	Coefficient	Robust Std.error	T-statistics	P-value
C	3,4531	1,7811	1,9388	0,0549
Log(asset)	0,1982	0,0592	3,3479	0,0009
Current ratio	0,5548	0,2736	2,0278	0,0433
Profit margin	0,2127	0,0578	3,6751	0,0003
Revenue growth	0,1104	0,0572	1,9279	0,0544
Leverage	-0,0663	0,0361	-1,8366	0,0667
Operating CF/Revenue	0,3214	0,1102	2,9171	0,0037
Financing	-0,3774	0,1704	-2,2148	0,0272
Dual	0,0711	0,0289	2,4594	0,0139

Because we have detected a heteroscedasticity problem, we run the regression under robust standard error.

First, we look into the coefficients of performance variables. For this specific dataset, companies' log(asset), profit margin, current ratio, and cash flow indicators are all significant on a 5% significance level. Revenue growth, leverage, and the fixed effect intercept term are all significant on the 10% level.

Next, looking at the signs, log(asset), profit margin, operating, revenue growth, and current ratio all have a positive effect on stock returns, whereas leverage shows negative coefficients. The results can be interpreted intuitively. Companies' growth potential, profitability, liquidity, and cash flow all have a positive impact on the stock price when they grow, while too much leverage may be a warning sign.

Next, we look into the coefficients for dummy variables. The dummy "Financing" is significantly negative, indicating that issuing new shares to refinance through either an SEO or an IPO will negatively affect the stock returns. The idea is in line with the general conception that issuing new shares decreases the stock price, and the companies will experience poor performance post-offering for a certain period (Lin, 2010). The coefficient represents the first "Difference": the act of raising more funds through issuing new equity will affect the stock return by -0.3774.

Our focus here is the sign and significance of the coefficient for "Dual". The coefficient is significantly positive. The coefficient of 0.0711 means companies with dual-listing decisions has 0.0711 of difference in stock reaction compared with companies only SEO in Hong Kong. So when companies want to raise funds, they should expect a -0.3774 change in stock performance. However, if they decide to go to the mainland for the refinancing, they may expect a (-0.3774+0.0711) change in stock performance. This is the "difference in difference".

From the statistical results, we see that going back to the mainland can ease the negative market reactions for companies in need of financing. "Return with glory" takes the effect of a buffer and take some pressure off companies when they were to expect a

downhill stock performance after raising equity. The conclusion also serves as a motive for companies to return to the mainland for IPOs.

5.2 Event Study

We estimated the market model with data from the estimation window, then feed the market returns from the event window and obtained the expected return and abnormal return. Here, we calculated the cumulative abnormal return of each company in the window. Looking at the signs for the abnormal return from graph 4, we see that for companies who announced raising funds in the mainland, the abnormal return is positive on the announcement day and also the day after. But when companies announce a funding need in Hong Kong, the abnormal return is negative.

Graph 4: Cumulative abnormal return comparison
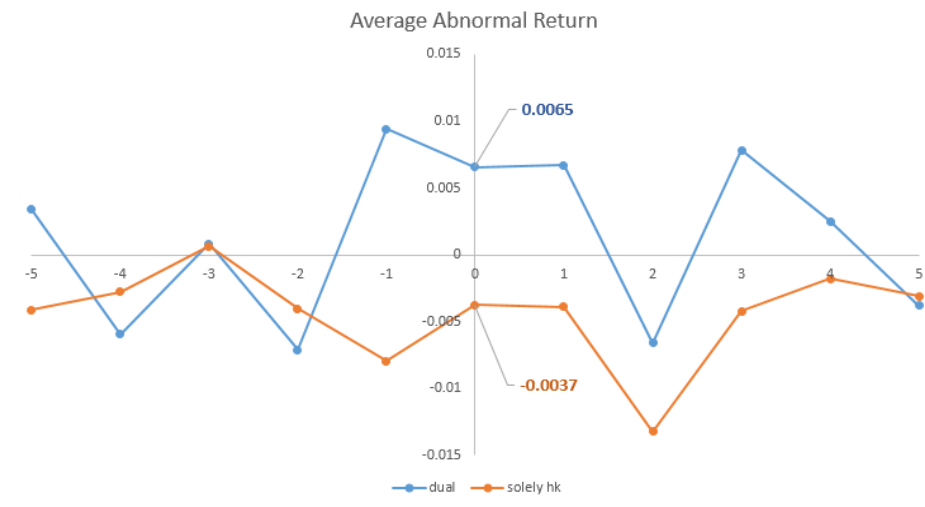
In order to clearly examine whether the event of Hong Kong SEO or Mainland IPO has a significant effect on the H-share excess return rate, we then use a simple t-test to test the null hypothesis of H0: CAR=0. The P-value from this test illustrates if the cumulative abnormal return across all companies is significantly different from zero. Results are shown below in table 5:

Table 5: CAR Significance tests

Variables	Mean	Std.Dev	T-test	P-value
CAR_Dual-listed	0,0013	0,0062	0,6710	0,5174
CAR_Solely HK	-0,0044	0,0036	-4,0617	0,0023

For companies that dual-listed, the p-value is 0.5174, so the effect of a mainland IPO on the companies' Hong Kong stock return is insignificant. For companies that only listed in Hong Kong, the p-value is 0.0023, so the effect of the event on the abnormal return is significant. Cumulative abnormal return is positive for dual-listed companies and negative for companies only did SEOs in Hong Kong.

We cannot reach the conclusion that a mainland IPO will have a significant impact on a positive abnormal return. However, it is clear that the issuance of new shares on the Hong Kong market has produced significantly negative abnormal returns.

Last, we test the difference between the two sets of cumulative abnormal returns. We construct the difference as dual-listed companies' abnormal return minus solely Hong Kong SEO companies' abnormal returns. The null hypothesis is that the difference is zero. Results are shown in table 6:

Table 6: Significance test between differences on cumulative abnormal returns

Denote: mean(diff) = mean (dual - solely HK)	
Test H0: mean(diff) = 0	
(1) Ha: mean(diff)<0	P-value = 0,9901
(2) Ha: mean(diff)!=0	P-value = 0,0197
(3) Ha: mean(diff)>0	P-value = 0,0099

We see that the difference is significantly positive. Therefore, it is significantly better to choose a mainland IPO over a Hong Kong SEO to meet funding needs. The significant difference further strengthened the results that returning for a mainland IPO will generate better short-term stock performance than seeking funds in Hong Kong. Therefore, investors holding the companies' shares react negatively to the idea that

companies are doing SEOs, but react relatively less negative when the company is going for a mainland IPO. The results from the event study take the perspective of existing shareholders, and the results show that for Hong Kong investors, companies do "Return with glory".

6. Model Robustness

To test the robustness of our Difference in Difference model, we run several diagnostic tests on heteroscedasticity, non-normality, and multicollinearity.

We run a White test to detect the heteroscedasticity, which means the variance of residuals is not constant, leading to incorrect inference. We can see that the p-value is 0.0000, saying that we reject the null hypothesis that the residuals are homoscedasticity (see Appendix table 8). We applied the White "robust" SE option built in Eviews to remedy the problem.

To detect the non-normality, which means the error term in the regression is not normally distributed. Theoretically, a perfect normal distribution ought to show a skewness of zero and kurtosis of three. We performed a Jarque-Bera (J-B) test on the residuals. From the test done, we found that the skewness is 0.577206 and kurtosis is 8.0461672 (see Appendix graph 5), indicating our model is right-skewed and leptokurtic. Thus, we reject the null hypothesis of normal distribution. In this paper, we choose to apply the transforming variables method to correct the problem. After attempting several transformations, using logarithmic profit margins can eliminate the non-normality problem.

Multicollinearity occurs when the explanatory variables are highly correlated with each other. Multicollinearity might cause the coefficient estimates to be susceptible to fluctuation with tiny changes in the specification, causing artificially high R-square, strange coefficient estimates, high standard errors, or unreliable inference. To test multicollinearity, we set up a correlation matrix between the independent variable. The rule of thumb of neat multicollinearity is corr $(x_i, x_j) \geq 0.8$. Our model does not have multicollinearity seen from the correlation matrix result (see Appendix table 9).

The method may be subject to certain biases. For example, selection biases of the threshold in defining what a sizable and comparable SEO/IPO is, lack of data for companies listed before 2003 and other restrictions from data availability, currency exchange, and new accounting policies may all cause some distortion to the data.

7. Conclusion

Dual-listing has been a popular approach for companies seeking fundings and international expansion. Generally, companies grow big from less developed domestic markets and march into developed markets. However, China, as the world's second largest economy with a fast-growing emerging market, has witnessed a wave of companies returning to the mainland for a second IPO. For companies already returned, the reputation makes fundings more accessible.

This thesis takes a closer look at the unique dual-listing route. We conducted a difference in difference method and an event study on companies dual-listed and the ones solely listed in Hong Kong. For the first method, we see that the market reacts negatively when companies issue equity financing. But the negative impact can be alleviated if they raise the equity through a mainland IPO. For the second method, the abnormal return is insignificantly positive for announcing a mainland IPO, significantly negative for announcing a Hong Kong SEO, and the two differences are significantly different from zero. Therefore, from the investor's shoe, companies making an initial public offering on mainland stock exchanges is a better funding approach than issuing seasoned equity offering in Hong Kong.

All the above concludes that returning to the mainland for dual-listing has a positive market reaction and positive short-term stock performance, in comparison to those issued seasoned equity offerings in Hong Kong. Companies "Return with glory" is an embedded idea for mainland investors, and we are able to prove the idea with statistics that companies have benefited from a dual-listing in the A-share market.
With the fast development of mainland stock markets, along with policy support in opening up mainland stock markets, we foresee more and more companies will follow the route of an initial IPO in Hong Kong and return to the mainland for a second listing.

In the meantime, we believe that the Chinese market will grow stronger when embracing the return of high-quality enterprises.

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Appendix

Table 4: Based on the selection criteria in the methodology, we have 71 companies only listed in Hong Kong. 7 companies with dual-listing in Shenzhen Stock Market (SZ), and 37 companies with dual-listing in Shanghai Stock Market (SH). In total, 113 companies' data were collected for this empirical research.

00161	中航國際控股	HK	01858	春立醫療	HK	601186	中国铁建	SH
00300	昆明機床	HK	01958	北京汽車	HK	601238	广汽集团	SH
00438	彩虹新能源	HK	02006	錦江酒店	HK	601298	青岛港	SH
00489	東風集團股份	HK	02120	康寧醫院	HK	601326	秦港股份	SH
00552	中國通信服務	HK	02218	安德利果汁	HK	601330	绿色动力环保	SH
00579	京能清潔能源	HK	02289	創美藥業	HK	601390	中国中铁	SH
00694	首都機場股份	HK	02345	上海集優	HK	601598	中国外运	SH
00696	民航信息網絡	HK	02355	寶業集團	HK	601600	中国铝业	SH
00747	沈陽發展股份	HK	02357	中航科工	HK	601618	中国中冶	SH
00814	北京京客隆	HK	02386	中石化煉化工程	HK	601633	长城汽车	SH
00816	華電福新	HK	02488	元徵科技	HK	601717	郑煤机	SH
00840	天業節水	HK	02698	魏橋紡織	HK	601727	上海电气	SH
00916	龍源電力	HK	02722	重慶機電	HK	601766	中国中车	SH
00956	新天綠色能源	HK	02777	富力地產	HK	601800	中国交通建设	SH
00958	華能新能源	HK	02868	首創置業	HK	601808	中海油田服务	SH
00980	聯華超市	HK	03323	中國建材	HK	601811	新华文轩	SH
01066	威高股份	HK	03330	靈寶黃金	HK	601828	红星美凯龙	SH
01099	國藥控股	HK	03332	中生聯合	HK	601857	中国石油股份	SH
01133	哈爾濱電氣	HK	03378	廈門港務	HK	601865	福莱特玻璃	SH
01272	大唐環境	HK	03396	聯想控股	HK	601866	中远海发	SH
01289	盛力達科技	HK	03399	粵運交通	HK	601869	长飞光纤光缆	SH
01296	國電科環	HK	03636	保利文化	HK	601880	大连港	SH
01353	諾奇	HK	03689	康華醫療	HK	601898	中煤能源	SH
01459	鉅匠建設	HK	03833	新疆新鑫礦業	HK	601899	紫金矿业	SH
01527	天潔環境	HK	03898	中車時代電氣	HK	601919	中远海控	SH
01533	莊園牧場	HK	03948	伊泰煤炭	HK	601992	金隅集团	SH
01558	東陽光藥	HK	03969	中國通號	HK	603157	拉夏贝尔	SH
01588	暢捷通	HK	03983	中海石油化學	HK	603259	药明康德	SH
01596	翼辰實業	HK	03996	中國能源建設	HK	603993	洛阳钼业	SH
01599	城建設計	HK	06188	迪信通	HK	000338	潍柴动力	SZ
01666	同仁堂科技	HK	06189	愛得威建設集團	HK	002460	赣锋锂业	SZ
01786	鐵建裝備	HK	06826	昊海生物科技	HK	002490	山东墨龙	SZ
01798	大唐新能源	HK	06839	雲南水務	HK	002594	比亚迪股份	SZ
01799	新特能源	HK	600027	华电国际电力	SH	002672	东江环保	SZ
01816	中廣核電力	HK	600196	复星医药	SH	002703	浙江世宝	SZ
01818	招金礦業	HK	600547	山东黄金	SH	002910	庄园牧场	SZ
01819	富貴鳥	HK	601068	中铝国际	SH	601111	中国国航	SH

| 01829 | 中國機械工程 | HK | 601088 | 中国神华 | SH | - | - | - |

Table 5: Constructing variables for difference in difference approach. Taking three companies as examples.

Stock Code	Time	Stock Return	Operating CF/Sales	Current Ratio	Leverage	Log (Asset)	Sales Growth	Financing	Dual
00161	2010/12/31	-0.523	1.09	1.11	2.49	10.76	0.37	1	0
00161	2011/12/31	0.363	1.00	0.92	2.47	10.60	0.12	1	0
00161	2012/12/31	0.057	0.30	0.85	2.35	10.67	0.50	1	0
00161	2013/12/31	-0.119	0.60	1.25	1.66	10.24	0.01	1	0
00161	2014/12/31	0.097	0.08	0.94	2.70	10.81	0.07	1	0
00161	2015/12/31	0.172	0.32	1.20	1.55	10.27	0.00	1	0
00161	2016/12/31	0.056	0.05	1.05	2.14	10.13	-0.08	1	0
00161	2017/12/31	0.172	0.12	1.20	1.55	10.27	0.00	1	0
00161	2018/12/31	0.056	0.03	0.48	2.11	10.06	-0.08	1	0
00300	2011/12/31	0.041	0.38	1.62	0.76	9.07	0.13	0	0
00300	2012/12/31	0.094	1.24	1.32	1.03	9.09	-0.02	0	0
00300	2013/12/31	0.127	2.78	1.13	1.94	9.30	-0.11	0	0
00300	2014/12/31	-0.104	2.11	1.41	0.87	9.45	-0.40	1	0
00300	2015/12/31	-0.430	-0.03	1.85	0.58	9.28	0.16	1	0
00300	2016/12/31	0.334	0.18	1.37	1.40	9.35	-0.16	1	1
00300	2017/12/31	-0.007	0.29	1.28	1.76	9.41	0.02	1	1
00300	2018/12/31	-0.152	0.10	1.45	1.20	9.45	0.22	1	1
00338	2010/12/31	0.135	-0.16	1.45	2.90	9.41	0.06	0	0
00338	2013/12/31	0.148	-0.48	1.64	1.49	9.45	0.21	0	0
00338	2014/12/31	0.007	-0.60	1.34	1.55	9.94	0.07	0	0
00338	2015/12/31	-0.008	-0.34	1.30	2.34	9.56	0.47	0	0
00338	2016/12/31	0.070	-0.85	1.49	1.15	10.12	0.20	1	1
00338	2017/12/31	0.078	0.14	1.22	1.54	10.09	0.14	1	1
00338	2018/12/31	-0.099	0.17	1.64	1.39	10.10	0.29	1	1

Table 6: Event date is the date of announcing mainland IPO for dual-listed companies. Event date is the date of announcing seasoned equity offering for only Hong Kong-listed companies. Event date is denote as t=0. The estimation window is (-130,-6). Market return and stock return only takes into account of trading days.

Date	Code	Return	Market	Event Date	dif	event_ window	estimation_ window
4/10/2012	03838	-0.0406	0.0028	8/8/2012	-130	0	1
4/11/2012	03838	0.0238	-0.0105	8/8/2012	-129	0	1
4/12/2012	03838	-0.0139	-0.0045	8/8/2012	-128	0	1
4/13/2012	03838	-0.0282	0.0131	8/8/2012	-127	0	1
4/16/2012	03838	-0.0277	-0.0053	8/8/2012	-126	0	1
…	…	…	…	…	…	…	…
7/25/2012	03838	-0.0017	-0.0014	8/8/2012	-10	0	1

7/26/2012	03838	-0.0066	0.0101	8/8/2012	-9	0	1
7/27/2012	03838	0.0017	0.0011	8/8/2012	-8	0	1
7/30/2012	03838	0.0067	0.0118	8/8/2012	-7	0	1
7/31/2012	03838	-0.0050	-0.0060	8/8/2012	-6	0	1
…	…	…	…	…	…	…	…
5/18/2017	06116	0.0100	-0.0033	9/25/2017	-130	0	1
5/19/2017	06116	-0.0079	0.0015	9/25/2017	-129	0	1
5/22/2017	06116	-0.0020	0.0064	9/25/2017	-128	0	1
5/23/2017	06116	0.0020	0.0021	9/25/2017	-127	0	1
5/24/2017	06116	0.0000	0.0021	9/25/2017	-126	0	1
9/11/2017	06116	0.0127	0.0109	9/25/2017	-10	0	1
9/12/2017	06116	-0.0198	0.0050	9/25/2017	-9	0	1
9/13/2017	06116	0.0011	0.0033	9/25/2017	-8	0	1
9/14/2017	06116	0.0627	-0.0042	9/25/2017	-7	0	1
9/15/2017	06116	0.0280	0.0006	9/25/2017	-6	0	1

Table 7: Expected return is estimated with parameters from estimation window. Abnormal return is the difference from actual return to expected return.

Date	Code	Return	Market	Event date	dif	event_ window	est_ win	expected return	abnormal return
8/1/2012	03838	-0.0017	-0.0025	8/8/2012	-5	1	0	0.00177	-0.00011
8/2/2012	03838	-0.0167	-0.0100	8/8/2012	-4	1	0	0.00166	0.01503
8/3/2012	03838	-0.0306	-0.0069	8/8/2012	-3	1	0	0.00017	0.03039
8/6/2012	03838	-0.0095	-0.0011	8/8/2012	-2	1	0	0.00383	-0.01336
8/7/2012	03838	0.0206	0.0045	8/8/2012	-1	1	0	0.00258	0.01806
8/8/2012	03838	0.0296	0.0196	8/8/2012	0	1	0	0.00882	0.02083
8/9/2012	03838	0.0118	0.0096	8/8/2012	1	1	0	0.00358	0.00820
8/10/2012	03838	-0.0375	0.0027	8/8/2012	2	1	0	0.00180	-0.03931
8/13/2012	03838	-0.0013	0.0034	8/8/2012	3	1	0	0.00364	-0.00498
8/14/2012	03838	-0.0027	0.0192	8/8/2012	4	1	0	-0.00047	-0.00222
8/15/2012	03838	-0.0202	0.0005	8/8/2012	5	1	0	0.00017	-0.02041
…	…	…	…	…	…	…	…	…	…
9/18/2017	06116	-0.0113	-0.0288	9/25/2017	-5	1	0	0.00131	0.01004
9/19/2017	06116	0.0230	-0.0014	9/25/2017	-4	1	0	0.00086	0.02210
9/20/2017	06116	0.0827	0.0104	9/25/2017	-3	1	0	0.00159	0.08116
9/21/2017	06116	0.0000	0.0075	9/25/2017	-2	1	0	-0.00022	0.00022
9/22/2017	06116	-0.0056	0.0058	9/25/2017	-1	1	0	0.00095	0.00467
9/25/2017	06116	-0.0056	0.0082	9/25/2017	0	1	0	0.00116	0.00449
9/26/2017	06116	0.0159	0.0033	9/25/2017	1	1	0	0.00136	0.01455
9/27/2017	06116	0.0034	0.0043	9/25/2017	2	1	0	0.00205	0.00130
9/28/2017	06116	-0.0045	0.0112	9/25/2017	3	1	0	0.00146	0.00300
9/29/2017	06116	-0.0285	-0.0026	9/25/2017	4	1	0	0.00311	0.02539
9/30/2017	06116	0.0000	0.0220	9/25/2017	5	1	0	0.00205	-0.00205

Table 8: Heteroscedasticity test result

Heteroskedasticity Test: White

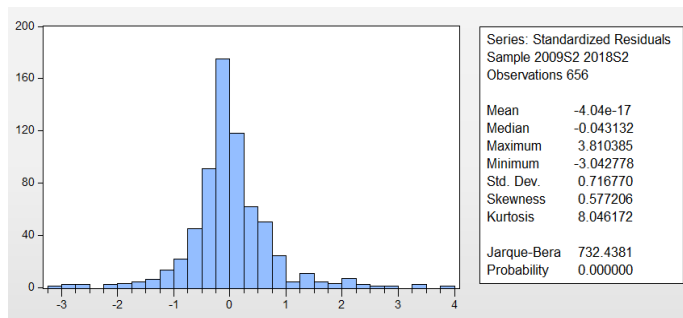|			
Null hypothesis: Homoscedasticity			
F-statistic	84.91066	Prob. F(6,538)	0.0000
Obs*R-squared	378.2241	Prob. Chi-Square(6)	0.0000
Scaled explained SS	496.8364	Prob. Chi-Square(6)	0.0000

Graph 5: Normality test result

Table 9: Multicollinearity test result

	Return	Current ratio	CF/Revenue	Leverage	Log(Asset)	Sales g	Profit Margin
Return	1.0000	0.0669	-0.0148	-0.0572	-0.0361	0.0118	-0.0433
Current ratio	0.0669	1.0000	-0.1323	-0.1568	-0.0019	0.0184	-0.0869
CF/Revenue	-0.0148	-0.1323	1.0000	0.0088	0.0678	-0.0276	0.0830
Leverage	-0.0572	-0.1568	0.0088	1.0000	0.0291	-0.0293	0.1228
Log(Asset)	-0.0361	-0.0019	0.0678	0.0291	1.0000	-0.0071	0.0170
Sales g	0.0118	0.0184	-0.0276	-0.0293	-0.0071	1.0000	-0.0853
Profit Margin	-0.0433	-0.0869	0.0830	0.1228	0.0170	-0.0853	1.0000