HEC MONTRÉAL

ADRs and Motivations Behind
Chinese Firms Cross-Listing Decision

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Abstract:

In this paper, we look at performance and fundamental differences between Chinese cross-listed firms (particularly Chinese ADRs) and Chinese mainland listed firms that chose not to cross-list. Our study aims to find the reasons and motivations that influence Chinese firms' decision to cross-list particularly in U.S. stock exchanges. Moreover, we look at inherent characteristics in firm's early lifetime to help understand how the differences in these variables and characteristics can help us recognize firms that chose to cross-list even before they do cross-listing. For our study, we have 3 sample of stocks to work with, each sample is a representative of a benchmark for mainland Chinese stocks, Chinese stocks that go for cross-listing in Hong Kong, and then a sample of Chinese stocks that further go for cross-listing in U.S. stock exchanges after cross-listing in Hong Kong and data ranges from 1993-2022. In our first test, we run logit regressions on fundamental characteristics of firms (leverage, firm size, average traded volume, and sales growth), operating variables (ROA, ROE) and market variables (Cumulative Holding period returns) that we believe and as informed by theories on cross-listing literature significantly impact firms' decision to cross-list. Our first logit model is at the time after IPO in mainland Chinese stock exchange, we call this time as early stage in firm's life as this is before they went for any cross-listing. Then we do another logit model on our Hong Kong and ADR cross-listed samples after they do cross-listing in Hong Kong. These models are employed at each stage to examine how these variables change after cross-listing and how the differences in these variables among samples impact firms' decision to cross-list. For our 2nd test we look to test the impact cross-listing event has on cross-listing stocks in terms of market and operating performance. For this purpose, we conduct an event study. Though our results from logit model are not significant when tested at 5% level, however they do provide important economic information such as we see that large size firms are 1.29 times or 29% more likely to consider for cross-listing compared to smaller size firms. Also, we see firms that deliver good holding period returns indicating sound growth, stability and confidence from investors are 27% more likely to cross-list. Furthermore, what we see is that in cross-listing in U.S. stock exchanges by Hong Kong cross-listed firms, leverage and increased trading volume have a positive and influential effect on their decision to go for ADR listing. To test our findings on post cross-listing stock price performance and operating performance via event study, we see underperformance over the long run for Chinese ADRs, however we do see an improvement in operating variables of ADRs post cross-listing in U.S. stock exchange.

Keywords: Holding period returns, cumulative abnormal returns, American depositary receipts(ADR), cross-listing

Research methods: Logit regression, event studies

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CHAPTER 01:
Introduction:

The conventional wisdom surrounding the cross-listing of emerging markets firms in prominent and global stock exchanges such as those in U.S. is that cross-listing allows these firms access to wide global shareholder base, opportunities to raise capital, improves trust among investors and helps in improving governance of firms that must abide by strict regulations regarding financial disclosure and reporting and number of provisions of U.S. securities law, as well expand and diversify in global markets as their businesses gets known globally. This is crucial for companies from developing countries that look to improve their presence, carry, and execute their growth projects so they can compete on a global scale. A company's decision to list on a cross-border stock exchange has attracted great interest in the financial literature work. Research work analyzing the proliferation of these foreign listings focuses on the underlying motives and cost-benefit calculus of companies listing outside their home market (Karolyi 1998, 2006). Among the benefits, cross-listings can reduce market segmentation problems (Forester & Karolyi 1999, Miller 1999), enhanced firm visibility and reduced information asymmetries (Baker, Nofsinger and Weaver 2002), lower cost of raising capital, improve liquidity and strengthen investor protection (Coffee 1999, Stulz 1999). Empirical studies on cross-listing on U.S. exchanges document significant valuation gains for cross-listed firms vis-à-vis firms that do not cross-list (Doidge, Karolyi and Stulz 2004).

In this paper, we look at performance differences between Chinese cross-listed firms and Chinese firms that chose not to cross-list. Our study aims to find whether the benefits mentioned in previous literature work on cross-listing hold true or not for Chinese firms. This would help us find out the motivations that are behind Chinese firm's decision to cross-list. Our focus is on Chinese firms because during past 2-3 decades, the number of Chinese cross-listings especially in U.S. exchanges increased by many folds. Cross-listing is particularly attractive for companies based in high growth developing economies such as China, India, Brazil, South Korea because listing on a prestigious and popular foreign stock exchange may boost visibility and lower capital costs, but only if the firm is originally listed in a location that does not offer these types of potential benefits. Firms in such countries such as China face challenges in raising capital at a good cost, delay in executing growth opportunities because there is not free flow of capital, restrictions are imposed by local governments on foreign investors willing to bring capital, capital markets are not fully developed and transparent. Therefore, by cross listing in popular U.S. exchanges such as NYSE, Nasdaq and AMEX and Hong Kong (the 2nd most popular destination for Chinese cross-listed firms), these companies can tap into more liquid and trusted markets. Therefore, our study

would focus on Chinese cross-listings in U.S. and Hong Kong market, as both are the top destinations for Chinese cross-listed firms. As the largest emerging market in the world, China has had enormous economic growth in past 3 decades and it also lifted many restrictions on its financial markets. Schumkler (2006), also claims that countries that experience high economic growth are more likely to have their firms listed overseas in effect of globalization and strong growth opportunities, therefore, to raise more capital. 252 out of 454 ADRs listed in U.S. are Chinese with the combined market cap of $1.03 Trillion as of Jan 09, 2023 *(uscc.gov)*[1]. In the past decade, number of Chinese ADRs listings in U.S. have grown dramatically, not just in terms of their numbers but also in terms of market capital (Chart 01) (Citi Bank, 2021)[2].

FIGURE 01: Performance History of Chinese Cross-listed Stocks Benchmark

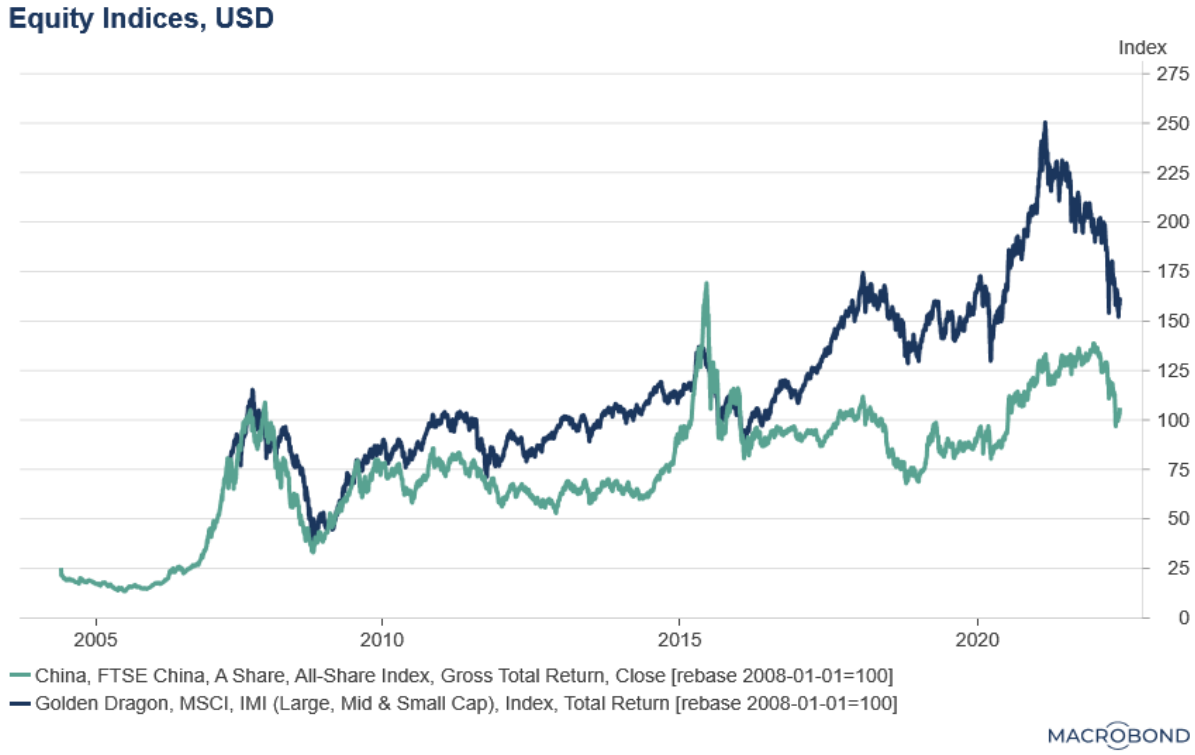


Figure 01 depicts the performance history of MSCI Nasdaq Golden Dragon Index, that is the benchmark index for cross-listed Chinese stocks (includes Hong Kong and U.S. listed) and China A share index, that is the benchmark for top Chinese companies listed in mainland China.
(*Source: Macro bond, 2024)* [3]

U.S. is the most popular destination when it comes to cross-listing of shares. Not just Chinese firms but firms from other developing and developed countries

[1] USCC. Gov, *U.S.-China Economic and Security Review Commission, 01/09/2023*

[2] Citi Bank, *Depositaryreceipts.citi.com,* 2021

[3] Macro bond financial, 2023

alike chose U.S. as their cross-listing destination and that is why the cross-listing of shares in U.S. stock exchanges has increased over the years as according to Karolyi (2006), even though it involves some agency cost in the form of complying with strict regulatory and disclosure standards. That is why American depositary receipt aka ADR is the most common and popular method firms use to cross-list their shares. The table below outlines countries with largest equity market share.

TABLE 01: Countries with Highest Share of Equity Market Value

COUNTRY	Share of World Equity Market Value (As of Jan 2023)
U.S.	58.4%
U.K.	4.1%
China	3.7%
Canada	2.7%
India	1.8%
Taiwan	1.6%
South Korea	1.3%

Table 01 shows the countries list with highest share of world equity market value (Statista, 2023)[4]

According to these statistics, U.S. stock market accounts for almost 60% share of world equity market capitalization, far more than all other countries equity market share mentioned in the table combined. With this much influence and market share, it is evident that U.S. stock exchanges and companies listed there are followed by wide and broad base of global shareholders and that ADR is the most popular method firms use to cross-list.

As mentioned in the literature work by Baker, Nofsinger and Weaver (2002), we are conjecturing that the status or prestige of an exchange may result in increased market visibility of the firm, thus affecting their ex-post market performance and valuation. Furthermore, Coffee (1999) and Stulz (1999) argue that firms cross-list in order to raise capital, explore and expand into new markets, and get worldwide coverage but also accept agency cost by bonding themselves to strict rules and regulations of the host country as listing overseas obligates a firm to abide by strict financial reporting and disclosure standards to comply with host country exchange and securities laws.

[4] Statista, Distribution of countries with largest stock markets worldwide as of January 2023, by share of total world equity market value.

This study therefore will involve comparative analysis between cross-listed firms and non-cross-listed firms across various dimensions such as financial metrics, operational performance, market valuation, and governance structures. This comparative approach seeks to provide insights into the motivations that influence Chinese firms' decision to cross-list in U.S. Our paper aims to contribute to the existing literature by empirically examining whether cross-listing on prestigious exchanges enhances firm performance, governance, and market visibility for Chinese firms. It aligns with prior studies that have explored similar themes and intends to provide empirical evidence to support or refute these hypotheses. The primary objective is to study whether cross-listing on prestigious exchanges (like NYSE or Nasdaq) provides benefits such as increased asset valuation (book value), revenue growth (enhanced opportunities), higher trading volume, and improved access to capital compared to non-cross-listed Chinese firms. Furthermore, the paper intends to evaluate the impact of cross-listing on operational performance metrics such as Return on Assets (ROA) and Return on Equity (ROE). This evaluation will help determine whether cross-listed firms demonstrate better operational efficiency and improvement in corporate governance structure compared to locally listed Chinese firms. The basic rationale of good corporate governance is to protect rights of shareholders, reduce principal agent problem, increase the performance of companies by structuring and sustaining incentives that initiate corporate managers to maximize firm's operational efficiency and long-term sustainable growth through limiting managers' abuse of power over corporate resources. Therefore, the impact of good governance should thus be reflected in firm's operating performance that could be measured using operating performance metrics that are ROA and ROE. Moreover, increased market visibility due to cross-listing on prestigious exchanges is hypothesized to positively influence firm valuation and market performance. This research aims to empirically compare the market performance of Chinese firms cross-listed on Hong Kong and U.S. exchanges with those that remain solely listed in China.

What is an ADR:

ADR is by far the most popular and adopted by the likes of some of the world's biggest firms such as Tencent, Alibaba, Baidu and Didi, for example. Each issued ADR represents a fraction or multiple of underlying share that is held in the custody of a financial institution mainly in foreign firm's home market and is also called a "Ratio" *(sec.gov,2012)*[5]. "The first ADR was invented in 1927 and it gave American investors their first opportunity to purchase foreign stock without concern for settlement delays and other vagaries associated with

[5] SEC, *Office of Investor Education and Advocacy,* August 2012

overseas securities transactions" Winston & Strawn LLP (2009). ADRs are now recognised as the mainstream investment mechanisms by which U.S. investors purchase the securities of foreign issuers. ADR can be sponsored or non-sponsored, however since 1980's almost all the ADRs in U.S. must be sponsored according to the regulations. A sponsored ADR[6] is issued with the agreement and the approval of the underlying firm which works with the designated depositary bank (sec.gov,2012)[i].

Types of ADRs:

Sponsored ADRs are normally listed on NYSE, Nasdaq, AMEX and are also traded in the OTC market. These ADRs are further classified into levels and classification is based on the extent of access, each ADR has to the U.S. exchanges. The types of ADR are sponsored Level 1, level 2, level 3 and Rule144A or non-sponsored ADRs.

- **Sponsored Level 1 ADRs** are traded in the OTC market and there is no new capital raised in their issue. Instead, existing shares are sold to new foreign investors and the company forms the relationship to handle receipts with single depositary bank. Because the company only forms a relationship with single financial institution for depositary receipts, there is a degree of control on ADR's issued by the company *(Deutsche Bank,2021)*[7].

- **Sponsored Level 2 ADRs** also sell existing shares and no new capital is raised. However, these ADRs are traded on major U.S. exchanges such as NYSE, Nasdaq. Level 2 ADR gives foreign company greater visibility without raising new capital *(Deutsche Bank, 2021)* .

- **Sponsored Level 3 ADRs** like Level 2 trade on major American stock exchanges, however this type of ADR allows foreign companies to issue new equity and raise capital. Rule 144A also allows to issue new equity and raise capital, however, this type is reserved for institutional investors through QIB (program for qualified institutional investors) *(Deutsche Bank,2021).*

[6] Sponsored ADRs are those in which the non-U.S. company enters into an agreement directly with the U.S. depositary bank to arrange for recordkeeping, forwarding of shareholder communications, payment of dividends, and other services. An unsponsored ADR is set up without the cooperation of the non- U.S. company and may be initiated by a broker- dealer wishing to establish a U.S. trading market (SEC.GOV)

[7] Deutsche Bank, *Depositary Receipt Services*, 2021

- **Non-Sponsored ADRs** unlike sponsored ADRs is set up without the cooperation of the foreign company and maybe initiated by a broker or dealer wishing to establish a U.S. trading market for foreign company's stock.

The difference between these types also comes regarding regulatory and filing requirements. Since level II and level III ADR are registered on major stock exchanges, they must comply with the SEC's full registration and reporting requirements. "In addition to filing an F-6 registration statement, the company is also required to file SEC Form 20-F and to comply with the SEC's other disclosure rules, including submission of its annual report which must be prepared in accordance with US Generally Accepted Accounting Principles (US GAAP) or International Financial Reporting Standards (IFRS)" *(Deutsche Bank,2021)*[8]. Level 1 Program is exempted from full SEC reporting requirements as it is exempted under rule 12g3-2(b). Therefore, Level 1 and Type 144A (as they are not traded on stock exchanges) are only required reconciliations under home market accounting principles.

[8] Deutsche Bank, *Depositary Receipt Services*, 2021

CHAPTER 02:
Literature Review:

A lot of literature work on motivations behind firm's decision to cross-list has been done. In this section we will review some of the related literature work and provide empirical evidence on cross-listing phenomena. There are conventional theories that justify the motivation for firms that adopt for ADR listing and those are as follows:

1-market segmentation hypothesis
2-liquidity hypothesis
3- investor recognition hypothesis
4- bonding hypothesis

Investor Recognition hypothesis; (Merton, 1987):

The key assumptions made by Merton (1987) in his model is that investors use only those securities when constructing portfolio that they know about and about which there is good amount of information available. Merton's model indeed introduces the concept of investor recognition as a key factor influencing stock returns and investor behaviour. In Merton's model, investor's recognition is referred as the degree of investors knowledge about a security. The key predictions of his model are:

1- Value of security increases with increased degree of investor recognition.

2- With increased degree of investor recognition, return on a stock decrease.

3- Investment activity in a stock increase with greater degree of investor recognition.

Studies, such as Liu and Thomas (2000), support the idea that investor recognition is a crucial driver in firm-level stock returns. Additionally, Brennan and Tamarowski (2000) suggest that investor recognition serves as a corporate investor relations tool, reducing the cost of raising capital for well-known firms. This is because when investors are investing in well-known firm's stocks, they don't have to worry about extra idiosyncratic risks, therefore the expected return demanded by them is low.

This model also demonstrates that number of investors is negatively related to required returns, and hence positively related to market value. The reason for explaining this is because cross-listing securities on popular stock exchanges is seen as a strategy that leads to greater investor recognition, increased coverage and that results in great investment activity for that stock which then reduces cost of raising capital for the firm and could enhance firm's valuation. This is supported by Baker, Nofsinger, and Weaver (2002), Foerster & Karolyi (1999),

Lang, Lins, & Miller (2004), who demonstrate that firms listing on popular exchanges attract more analyst's coverage and media attention and as a result, cross-listed firms show better positive market return in the short run and less negative market return in the long run, compared with relatively unknown domestically listed peers. In summary, Merton's model sheds light on how investor recognition influences stock prices and investment activity, and it provides insights into the relationship between recognition, market value, and the cost of capital for firms.

Bonding Hypothesis:

Bonding hypothesis was first proposed by Coffee in his 2002 published study and later it was also supported by studies done by Doidge *et.al* (2004). Proposed by J.C. Coffee (2002) in his research paper "a test of bonding hypothesis", bonding in essence was mainly used in Law and Economics to refer to the cost that an agent (e.g., a firm) will incur to satisfy investors that it will perform as expected (returns will be as expected) and that enables an agent to market its security at higher prices.

How the bonding hypothesis relates to our paper is that one of our main points is that overseas firms, especially those from developing countries where investor protection is weak and there is lack of trust between investors and markets, firms look to cross list in countries such as U.S. with developed financial markets, subject themselves to strict regulatory, disclosure environment of that country, that is a cost so they can in turn sell their equity offerings at higher prices and raise funds they need for expansion or development projects. This is because bonding leads to develop trust and a mechanism where investor protection is ensured. Therefore, as mentioned by Coffee (2002) in his study, firms subject themselves to strict rules and disclosure standards to attract investment and raise capital that otherwise would be discounted by investors at higher rates to reflect lack of trust and risk associated with these investments if firms were to raise the capital in their domestic market for example China. Therefore, the main idea behind the bonding hypothesis is that for these overseas firms from developing economies, a U.S. stock exchange listing enhances investor confidence and reduces agency cost. In Doidge *et al*. (2004), it was acknowledged and found that firms domiciled in countries such as China, India where laws concerning investor protection are weak or are not implemented strongly, firms are more likely to cross-list even though there would be agency cost in form of facing strict disclosure requirements, "current U.S. regulations demand foreign listed companies choosing to cross-list in U.S., and trade on U.S. stock exchanges (sponsored level 2 and 3 ADRs) to comply with U.S. GAAP, either by filing a

20-F reconciliation, according to which these ADRs must meet partial SEC disclosure requirements, or by filing 10-K reports"[9].

How the bonding occurs is not a disciplinary action such as through courts but rather is a market action because the phenomenon of bonding is facilitated by intermediaries such as brokers, analyst coverage, credit rating agencies that help develop trust; Coffee terms this as reputational bonding. Information asymmetry decreases due to improved disclosure and coverage, resulting in higher valuation for cross-listed firms. Bonding relationship plays an important role therefore in developing trust between foreign firms and shareholders also, thereby improving shareholder protection mechanism. As discussed by Lang *et al*. (2003), by listing on major stock exchanges, complying with U.S. GAAP and strict disclosure requirements, firms improve their information environment as they get greater coverage by analyst, media, the activity in their stock increases as companies in these major exchanges get a large shareholder following. To the extent that the information asymmetry component of cost of capital decreases due to improved information environment and coverage, cross-listing firms also receive a higher valuation compared with non-cross-listed firms, consistent with the findings of *Doidge et al.* (2004) and similar result was found by a comprehensive study done by "Kang, Tony; Kristian Hope, Ole (2004)".

Furthermore, in a 1999 study by Miller where he examined ADRs, Miller found that benefits of ADRs are clearly visible for those ADRs that have highest level of disclosure and regulation standards such as Sponsored level 2 & 3 ADRs that trade on main American exchanges and must abide by SEC rules & regulations (Miller, 1999). The concept of reputational bonding emerges as a critical aspect in building trust and enhancing the overall position of these firms in the global financial landscape. Moreover, effective bonding maybe a pre-condition for generating great turn over for foreign listed firms. This is because effective bonding itself is a result of rules and regulations that come with cross-listing requirements and adhere firms to strong disclosure requirements., also with effective bonding in place, companies are in a better position to negotiate terms of raising capital, their operating performance improves, and it strengthens company's reputation and position globally.

Market Segmentation Hypothesis:

[9] Exceptions are Canadian and Israeli firms that list directly, a few Dutch firms that list as New York Registry Shares, and a handful of European companies that list directly as Global Registered Share (GRS). The 10-K filing refers to the annual report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934.

Alexander et al. (1987) argues that higher barriers between stock markets would lead to higher risk premium demanded by investors and thus higher cost of capital for the companies. By cross-listing overseas and especially in popular exchanges such as NYSE, Nasdaq, companies get access to global investor base and as a result can overcome the barriers that exist between financial markets. Therefore, that leads to investors demanding lower return and for companies that means, they could raise capital for their projects at lower cost. As evidence, Foerster and Karolyi (2000) show that there are positive and significant long-run market returns in the U.S. market for companies from countries where accounting standards are low (such as China for example), when deposit receipts issued by these companies' benchmark against their domestic listed peers. Karolyi in his 2006 study further documents, that when foreign investors are restricted to invest in a company's domestic market, as we discussed earlier was and still is the case in some cases for China, where there are opportunities for growth but overseas investors are restricted to invest in certain class of shares, cross-listing of companies can provide investors to access these high growth stories at their home market besides achieving diversification benefits and allowing companies to exploit market and growth opportunities by raising capital at lower cost. The evidence from studies supports the notion that cross-listing can be a strategic move for companies from countries with lower accounting standards, offering them access to international capital and potential long-run market returns.

Liquidity Hypothesis:

Liquidity is an important factor in valuation especially for companies from developing economies. As studied by Vaihekoski (2004), emerging markets have less developed financial systems, securities have thin trading volume, and the bid/ask spreads are wider so the stock can easily deviate from its intrinsic value and be manipulated and that could affect investor's returns. According to this premise, firms opt for cross-listing to circumvent such domestic market efficiencies that discourage investors participation. High liquidity can drive the bid/ask spread narrow, improve liquidity as empirically proved in many studies as done by Karolyi (1999).

Amihud and Mendelson (1986) developed the liquidity hypothesis in the context of an asset pricing model in which gross returns are an increasing and concave function of liquidity measured by the bid-ask spread. In notational form, the gross return demanded by investor is:

$$\mathbf{E}(\boldsymbol{\mathcal{R}i, j}) = \boldsymbol{\mathcal{R}i} * + \cup \boldsymbol{iSj}$$

- $\boldsymbol{\mathcal{R}i}*$ is the required spread adjusted return
- $\cup\boldsymbol{iSj}$is the expected liquidation cost ($\cup\boldsymbol{i}$: the investor's liquidation probability, $\boldsymbol{Sj}$: Asset's relative spread)

If spreads drop following the listing because of increased trading volume (i.e., increased liquidity), the lower expected return demanded by the investor's should give rise to an increase in share value. Hence, an improved liquidity measured in terms of increase in trading volume is anticipated to lower the required rate of return, improve firm's valuation, give access to more investors, and reduce information asymmetry.

Background of Chinese Cross-Listed Stocks:

A large amount of literature work tests the market performance of cross-listed stocks with domestically listed stocks. Ji (2005) in his study finds that cross-listed stocks experience a higher valuation than their domestically listed peers. Furthermore, Zhou et al. (2011) in their study argue that cross-listing promotes corporate governance as firms get subjected to tougher rules and standards which further promotes operating performance of firms. Strict disclosure requirements are considered a crucial component of corporate governance, as they contribute to transparency, accountability, and the protection of stakeholders' interests. Huang and Song (2005) also in their study document that firms experience improved efficiency in terms of revenue per employee and overall revenue growth in three years after listing. However, some studies as those done by Huang & Song (2005), Luo & Jackson (2011) report that firms after cross-listing experience lower profitability and asset turnover ratio in three years after the listing. Luo et al. (2012) in their studies also document that Chinese cross-listed ADRs underperform benchmarks in three years period post-IPO period.

Furthermore, our rationale for improvement in operating performance comes from the fact the cross-listing requires firm to comply with a lot of regulations that enhances firm's corporate governing mechanism. For example, NYSE listing requirements for cross-border listings require a cross-listed firm to follow U.S. audit rules that requires each member of the audit committee to be a member of board of directors but otherwise be independent of the company, protection of whistle blowers, improved disclosure that requires firms to file forms 20-F or 10-K[10], adoption and maintenance of a code of ethics for senior officers, public disclosure about annual compensation paid to executives and

[10] Form 20-F is to standardize the reporting requirements of foreign cross listed companies in U.S., so investors can compare these on same parameters as domestic equities. Form 10-K discloses company's material results of their business operation for past fiscal year.

directors[11]. These internal controls are meant to protect investor's interest and reduce information asymmetry. Improvement in corporate governance mechanism creates positive image for company among global shareholders and boosts confidence (OECD, 2004). How the improvement in corporate governance structure improves operating performance is that good corporate governance develops several consistent mechanisms, internal control systems and external environments that contributes to business corporations' increased efficiency as a whole. The basic rational of improvement in corporate governance is to protect shareholder interest, increase the performance of companies by structuring and sustaining initiatives that allow corporate managers to maximize firm's operational efficiency, ROA and long-term sustainable growth through limiting agency problems, and abuse of power over corporate resources, and these effects can be best measured by firm's operating performance (OECD, 2004; Abdullah SN, 2004).

Therefore, in our paper we aim to test if the firms that cross-list are systematically different from those that don't go for cross-listing. We want to study the motives discussed in our literature that influence Chinese firms to cross-list and we do this by examining the ex-ante predictors of listing abroad stemming from various hypothesis. Similar to Pagano et al. (2002), we explore the possible motives that we discussed for listing abroad. Each motive suggests a set of firm characteristics that can be used to predict the probability of listing abroad and we examine these firm characteristics using the logistic model regression. This way we can find that a lot of what determines the choice between going for cross-listing or not may be inherent and observable early when all were listed in mainland Chinese exchanges.

Furthermore, we aim to examine the post-issue operating and market performance of the firms that list abroad *vis-a-vis* their domestic counterparts. We test these factors because market performance is an important gauge of firm's overall performance and lots of literature work, we quoted makes a case on market performance of cross-listed firms. Lastly, we want to examine if cross-listing really does enhance corporate governance structure of firms cross-listing in U.S. exchanges as described in theory, and we would investigate this using operating performance variables.

Therefore, our hypothesis questions are as follows:

1) How does the cross-listed and mainland only listed firms differ in terms of fundamental characteristics in their early lives and whether it's the

[11] https://resourcehub.bakermckenzie.com/en/resources/cross-border-listings-handbook/north-america/new-york-stock-exchange/topics/corporate-governance

difference in these characteristics inherent in their early mainland IPO time that influences cross-listing decision?

2) Does cross-listing event have an impact on market performance of cross-listed stocks?
3) Does the cross-listing in popular stock exchanges of the world such as U.S. improve the corporate governance structure of firm and hence the operating performance?

CHAPTER 03: DATA & VARIABLE DESCRIPTION

Our main source of data here is Bloomberg and for our studies we have 3 different list of stocks described below. Our samples have listings from 1993-2022 and cover diverse sectors. All three stock samples are shown below; we use all data in US$.

Table 2: Sample of Chinese Locally Listed Firms from China A50 Shares Index

Company	Sector
Bank of Ningbo	Financials
Contemporary Amperex Tech Co.	Industrial
East Money Information	Financial services
Foshan Haiting Flavoring	Consumer defensive
Foxconn Industrial Internet	Technology
Industrial Bank	Financials
Inner Monglia Yili	Consumer defensive
Jiangsu Hengrui Medicine	Healthcare
Jiangsu Yanghe Brewery	Consumer defensive
Kweichow Moutai	Consumer defensive
Longi Green Energy Tech	Technology
Luxshare Precision Industry	Technology
Luzhou Laojiao	Consumer defensive
Muyuan Foods	Consumer defensive
Pingan Bank	Financials
S.F. Holding	Industrial
SAIC Motor	Consumer cyclical
Shaanxi Coal Energy	Energy
Shanghai Pudong Development Bank Co.	Financials
shanghai Pudong Construction	Industrial
Shanxi Xinghuacan Fen Wine Factory	Consumer defensive
Shenzhen Mindray biomed	Healthcare
Tongwei Co. Ltd	Consumer defensive
Wanhua Chemical Group	Materials
Wuliangye Yibin co.	Consumer defensive
Yihia Kerry Arawana holding	Consumer defensive

We refer to the **mainland sample** as Chinese stocks that are only listed in domestic Chinese market. These stocks are from China A share market which is widely used and accepted benchmark of Chinese local market[12]. A-shares refer to shares issued by Chinese companies incorporated in mainland China, and open to foreign investors via the Qualified Foreign Institutional Investor (QFII), RMB Qualified Foreign Institutional Investor (RQFII), or the Stock Connect programs. From the A-share market, only those stocks made up to our list that only have a listing in Shanghai or Shenzhen stock exchange, that is this list of stocks do not have a secondary listing outside mainland China.

[12] FTSERussell.com, *FTSE China A50 Index,* 2022

Table 03: Sample of Chinese Hong Kong Cross Listed Firms

Company	Sector
China Tourism Group Duty Free	Retail
Livzon Pharmaceutical Group	Healthcare
Nanjing Panda Electronics	Technology
Zhengzhou Coal Mining Group	Consumer cyclical
Beijing Jingneg Power co.	Utilities
Shandong Xinhua pharmaceutical company	Healthcare
Beijing Jingcheng Machinery Electric Co.	Industrial
CSSC Offshore & Marine Engineering (Group) Company	Industrial
Beijing urban construction investment & development co.	Real estate
Shanghai Dazhong Public Utilities	Utilities
GF Securities	financial services
Shandong gold mining	Materials
Shandong Chenming Paper holdings	Materials
Shenzhen Hepalink Pharmaceutical Group Co., Ltd	Healthcare
Tianqi Lithium Corporation	Materials
Huatai Securities Co., Ltd.	financial services
Asymchem Laboratories (Tianjin) Co., Ltd.	Healthcare
China Everbright Bank Company Limited	financial services
Shenwan Hongyuan Group Co., Ltd.	financial services
Huaxin Cement Co., Ltd.	Materials
Joinn Laboratories (China)Co. Ltd.	Healthcare
China Merchants Securities Co., Ltd.	Financial Services

Our 2nd sample which we refer to as Hong Kong sample is a list of stocks from Chinese H shares index that come up to the following criteria: mainland Chinese companies that have initial listing in mainland China, and then do a listing in Hong Kong but didn't do an ADR. Therefore, we only chose the stocks from Chinese H shares index that fulfilled our criteria. (H shares are shares issued by companies incorporated on mainland China and listed on overseas exchanges most notably Hong Kong) [13].

Table 04: Sample of Chinese U.S. Cross-Listed Firms

[13] https://www.ubs.com/global/en/assetmanagement/insights/thematic-viewpoints/apac-and-emerging/articles/china-market-terminology.html

Company	Sector
ZTE Corporation	Technology Equipment
China Merchants Bank	Financial Services, Bank
Agricultural Bank of China	Financial Services, Bank
China Pacific Insurance Company	Financial Services, Insurance
China Citic Bank	Financial Services, Bank
China Vanke Co.	Real Estate
Wuxi Apptec	Healthcare
Zoomlion heavy industry	Industrial
Yankuang energy	Energy
Xinjiang Goldwind science & Techno	Industrial
Tsingtao Brewery	Consumer Defensive
Shandong Xinhua Pharmaceuticals	Healthcare
Shanghai Pharmaceuticals	Healthcare
Shanghai electric	Industrial
Hangzhou Tigermed consulting	Healthcare
Haitong Securities	Financial Services
Citic Securities	Financial Services
Ganfeng Lithium	Materials
Haier smart home	Consumer cyclical
China Railway group	Industrial
Metallurgical Corp of China	Industrial
Sinopec Shanghai petrochemical com	Energy
Sinotruk Jinan Truck co.	Industrial

Our third list is of ADR stocks, that is Chinese mainland stocks that went on to cross-list in Hong Kong and then for ADR listing in U.S. We chose such list for ADRs because we wanted to compare these with Hong Kong cross-listed and only mainland listed to examine what motivates Chinese companies to further adopt for ADR listing.

It is important to note that Chinese companies that cross-list might be different even early in their lives than those that do not opt for cross-listing. That means analysing cross-listed Chinese companies and those that don't cross-list in terms of fundamental characteristics such as growth, size, or how much leverage they have in their capital structure, how actively traded they are, might give us meaningful insights to examine how they differ and what factors influence their cross-listed decision. Furthermore, it is also important to note that cross-listed companies adopt different methods for ADR listing, some companies for example are initially Hong Kong listed and then they do a cross-listing in U.S.,

many just did an ADR without ever listing in China via VIE structure[14] and later they did a secondary listing in mainland or Hong Kong. Our list of stocks is those that first listed in mainland, then did a listing in Hong Kong and then went on to do an ADR. We want to see if the benefits associated with cross-listing described in literature review hold true or not *vis-à-vis* mainland listed stocks, and how these cross-listed companies differ than their mainland listed counterparts early in their lives before they go for cross-listing, that is why we chose our sample of stocks that were first listed in mainland and then did a cross-listing. Also, all the mainland listed stocks that cross-listed in U.S., first did a cross-listing in Hong Kong, therefore analysing them with our list of Hong Kong stocks, we would better understand why Chinese stocks ultimately opt for U.S. market listing even though they have an option of listing in Hong Kong.

Table 05: Stocks Samples Description

Mainland China, **Base case sample**	listed in mainland only Shanghai and Shenzhen stock exchange.
Mainland China> Hong Kong, **Honk Kong Sample**	mainland Chinese companies that have initial listing in mainland China, and then did a listing in Hongkong but didn't do an ADR.
Mainland China> Hong Kong>ADR, **ADR sample**	ADRs, that is stocks that have a listing in mainland Chinese market and then proceeded for a listing in Hong Kong and then the U.S. stock exchange.

Table 05 explains our samples listing destinations and method adopted for cross-listing by cross-listed firms.

[14] Explainer: The 'VIE' structure helping Chinese firms float abroad | Reuters

Table 06: Variables Description

Leverage	Calculated as total debt/shareholder's equity
Firm Size	Calculated as log of total assets in $ billion
Revenue Growth	Sales growth year on year
Average Annual Trading Volume	Calculated as average of annual trading volume
Return on Assets	Measure of operating performance, net income/ total assets
Return on Equity	Measure of operating performance, net income/ total shareholder's equity
Market Performance	Measure of market performance, calculated as cumulative 3-year holding period return

Table 06 describes the firm's fundamental, operating and market characteristics that we would examine to see how cross-listed, and mainland listed firms differ early in their lives in terms of these variables, and this might help us understand firm's cross-listing decision.

SAMPLE STATICTICS:
Table 07a: time=mainland IPO+2 years

Information variables	Mainland Sample	Hong Kong Cross listed sample	ADR sample
Leverage	3.19 (6.42)	2.10 (4.28) 0.23*	4.03 (6.76) 0.38**
Revenue Growth (%)	30.42 (30.07)	29.74 (71.47) 0.29*	33.1 (38.55) 0.34**
Annual avg. trading volume (in billion)	0.52 (0.598)	0.265 (0.389) 0.03*	0.65 (0.778) 0.17**
Firm size	7.17 (2.20)	6.64 (2.21) 0.15*	7.71 (2.79) 0.30**
Return on assets (%)	10.10 (8.48)	6.397 (6.41) 0.04*	5.52 (6.38) 0.02**

Return on equity (%)	18.85 (13.11)	10.56 (13.50) 0.008*	12.04 (13.51) 0.04**
3-yr Cumulative holding period return (%)	6.855 (4.53)	5.65 (4.169) 0.38*	5.107 (3.93) 0.24**

Table 07a presents the mean and in brackets the stdev of firm's information variables for all three samples after their IPO in mainland China stock exchange. The numbers are average for a 3-year period post IPO. Values with * are the t-stat for equality of means between mainland listed and Hong Kong cross-listed samples, values with ** are t-stat for equality of means between mainland listed and ADR cross-listed stocks.

Table 07b: time=Hong Kong cross-listing IPO+2-years

Information variables	Hong Kong Cross-listed sample	ADR sample	Hong Kong Cross-listed sample; change in information variables post cross-listing	ADR sample: change in information variables post cross-listing
Leverage	2.25 (4.28) 0.09***	3.56 (4.86) 0.09***	7.14%	-11.66%
Revenue Growth (%)	22.73 (71.5) 0.49***	23.36 (24.06) 0.49***	-23.57%	-29.4%
Annual avg. trading volume (in billion)	0.702 (0.39) 0.17***	1.02 (1.15) 0.17***	164.90%	56.92%
Firm size	8.57 (2.22) 0.08***	9.23 (1.96) 0.08***	29%	19.71%
Return on assets (%)	4.02	3.92	-37.15%	-28.98%

	(6.42) 0.35***	(3.27) 0.35***		
Return on equity (%)	9.81 (13.5) 0.30***	11.65 (7.55) 0.30***	-7.10%	-3.24%
3-yr Cumulative holding period return (%)	0.82 (2.60) 0.316***	3.61 (4.70) 0.316***	-85.48%	-29.31%

Table 07b presents the mean and in brackets the stdev of firm's information variables for our Hong Kong and ADR sample, after their cross-listing in Hong Kong. The table's columns 4 & 5 calculate the change in information variables for our two samples after their cross-listing in Hong Kong, the change is calculated using mean of information variables for 3-year period under observation post cross-listing compared to 3-year period post IPO in mainland. Values with *** are t-stat for equality of means between Hong Kong cross-listed and ADR cross-listed stocks.

Table 07c: time=ADR listing+2-years

Information variables	ADR sample	ADR sample: change in information variables post ADR listing against mainland IPO performance
Leverage	4.26 (4.95)	-23.66%
Revenue Growth (%)	20.42 (41.20)	3.93%
Annual avg. trading volume (in billion)	1.25 (1.44)	21.43%
Firm size	10.47 (2.06)	-25.45%
Return on assets (%)	3.81 (5.03)	-29.12%
Return on equity (%)	12.60 (10.03)	-29.50%

3-yr Cumulative holding period return (%)	2.58 (3.59)	-49.48

Table 07c presents the mean and in brackets the stdev of firm's information variables for our ADR sample after their cross-listing in U.S. exchanges. The table's column 3 calculates the change in information variables for our ADR sample stocks after their listing in U.S. exchanges, the change is calculated using mean of information variables for 3-year period under observation post ADR-listing compared to 3-year period post IPO in mainland, i.e. the benchmark to calculate performance against.

Table 07 provides summary statistics of firm's fundamental characteristics that might explain the inherent differences in firms early in their lives and help us understand how cross-listed firms differs from those that don't go for cross-listing and what factors motivate these firms cross-listing decisions. Furthermore, in table 04 we also discuss statistics of variables that we believe change after firms cross-listing and according to literature, the effect of cross-listing on firm can be measured by looking at these variables' performance, that include ROA and ROE to measure operating performance, and holding period return that measure market performance.

In table 07a, we look at fundamental, operating and market performance variables at time of mainland IPO for all three samples under consideration. This table therefore lays out the firm's characteristics in their early lives i.e., at time of mainland China IPO. If we look at fundamental variables, none of them is statistically significant except for average annual trading volume for Hong Kong cross-listed sample stocks (firms that cross-list in Hong Kong and don't go for ADR), that can suggest that it is an indicator that can tell us if firms with higher trading volume at time of mainland IPO are likely to cross-listing in Hong Kong. Furthermore, looking at differences in these variables, we note that ADR sample stocks are highly levered compared to mainland and Hong Kong cross-listed counterparts, revenue growth of ADR firms in this sample is highest too, firm size is large, and these firms' stocks are heavily traded compared to mainland and Hong Kong cross-listed sample stocks. That can explain the facts that we discussed in literature that Chinese stocks that go for cross-listing in popular stock exchanges of the world such as in U.S. are those experiencing high growth, that need to expand and reach global audience. That makes sense, because these firms are already highly levered in their early lives as they look to expand, these firms are large companies, and they are already popular among investors even early in their lives. This is interesting as it suggests that motivations, we discussed in literature review for ADRs are quite well the same as analysed here but not the same for Chinese companies cross-listing in Hong Kong. That means Chinese companies cross-listing in Hong Kong may only do for a dual-listing outside mainland China to attract foreign investors or bypass restrictions on investments as imposed by Chinese authorities' on investing in

mainland Chinese companies by foreigners, but not necessarily for the reasons we discussed in literature for ADRs, and that makes sense as these are the companies that don't go for further cross-listing in overseas markets. We discussed in literature that cross-listing in popular stock exchanges where accounting and regulatory standards are strict, improves corporate governance structure of cross-listed firms and that improves their operating performance, that could be a valid argument as we see both operating variables are statistically significant for both Hong Kong and ADR cross-listed firms, that means ROA and ROE for cross-listed firms is likely to improve after cross-listing event. Though initially at time of mainland IPO, both Hong Kong and ADR cross-listed stocks perform poorly when measured in terms of their operating performance and market performance.

In table 07b, we look at fundamental, operating and market performance variables at time of Hong Kong cross-listing for our two cross-listed samples, one that further go for ADR cross-listing and other that don't. Though we don't see any statistical significance for any of the variables, but it's important to note how the variables change after cross-listing in Hong Kong for both samples and if it explains anything for ADR sample stocks that further go for cross-listing in U.S. For both sample stocks, we see increase in trading volume, less for ADRs though as they already come from a high base, that explains that Hong Kong stock exchange has a wider investor base as it does not have same restrictions as Chinese companies listed in mainland stock exchanges have, and that could be the reason why some Chinese companies chose to cross-list in Hong Kong[15]. Interestingly, we saw reduction in leverage for ADR sample stocks and leverage for Hong Kong cross-listed stocks increased, but that is also because ADR sample stocks were quiet highly levered even early at mainland listing time, in level terms leverage for ADRs stocks still says quite high than Hong Kong cross-listed peers. Though we notice reduction in revenue growth after cross-listing in Hong Kong, but growth is still phenomenal at around 23%. For ADRs, slowdown in growth is consistent with reduction in leverage. Importantly firm size for both sample stocks increased a lot when measured for 3-year period post Hong Kong cross-listing, and that comes from the fact that both sample stocks had high growth and used leverage to expand. Furthermore, in terms of operating and market performance, we see deteriorating performance post cross-listing for both sample stocks, though less harsh for ADR sample stocks, and in level terms operating performance still stays quite good compared to global equities profile. This is quite different than what we discussed in literature based on previous studies being done on effects of cross-listing on Chinese firms post cross-listing performance. One reason could be companies listed in mainland stock exchanges have high risk premium, as there is less investor

[15] China equities: the alpha opportunity | A-share stock market analysis and outlook 2021 | UBS Global

activity, less trust and therefore, return demanded by capital providers is generally high[16]. One further reason is that H-shares (Chinese stocks and ADRs listed in Hong Kong) resemble global equities profile, where ROA[17] and ROE for MSCI ACWI for example is 1.95 and 12.01, for S&P 500 is 3.23 and 15.42, in that sense their operating performance is very much in line with global equities profile; while correlation of mainland Chinese stocks is very low with global markets; 0.39 with S&P 500 and 0.45 with MSCI ACWI[18].

Table 07c presents the fundamental, operating and market performance variables for ADR listed stocks for a 3-year period post ADR listing. What we notice is that average trading volume further increases to 1.25 billion, consistent with the fact presented in literature that Chinese firms adopt for ADR listing to tap wider investor base, have more opportunities to expand, and that is explained by the fact, that leverage further increases here and is the highest when recorded across all three IPO periods. Revenue growth stays at 20%, that validates our point that companies that adopt for ADR listing are those that are larger firms, have high growth and these firms look to expand overseas to compete on global scale, to get global coverage, tap wider investor base, and get access to capital. Though, where we see deteriorating performance is market returns, and that can be explained by the fact, that these firms are not growing at same rate as they were early in their lives, leverage is too high, and some ADRs cross-listed at times when in general market returns in global markets were very low due to recession or slowdown in growth. Also, many studies as those by Luo et al. (2012), also found that Chinese cross-listing stocks underperform benchmarks in three years post-IPO period.

[16] A shares in anatomy (goldmansachs.com)
[17] Both ROA and ROE are last 10-year average numbers
[18] Three reasons to consider allocating to Chinese A-shares | J.P. Morgan Asset Management (jpmorgan.com)

CHAPTER 04: HYPOTHESIS TESTING

4.1 Logit Model Results:

How does the cross-listed and mainland only listed firms differ in terms of fundamental characteristics in their early lives and whether it's the difference in these characteristics inherent in their early mainland IPO time that influences cross-listing decision?

Following the previous section, where I made some basic tests to examine the economical and statistical significance of variables under consideration, in this part we do a more formal investigation to test our claims. This section answers this question by presenting the results of logit regression that would help us investigate whether it's the difference in firm's intrinsic characteristics early in their lives that influences their decision to cross-list. The dependent variable is a dummy variable that is 1 for the firms that cross-list and 0 for the firms that do not cross-list. All data is examined on an annual basis for 3-years following the IPO date in mainland China for each list of stocks. The result of this test will help us assess the importance of intrinsic characteristics of the firms measured at their mainland IPO time that can be used to successfully predict the doing cross-listing decision. Note that this logit model does not tell us the destination of cross-listing chosen by Chinese firms, we would do another logit model on Hong Kong and ADR sample of stocks to predict the reasons behind Chinese firms' decision to cross-list in U.S. stock exchanges even though they have a cross-listing in Hong Kong.

We use a logit model to look at the relative importance of fundamental characteristics of firms (leverage, firm size, average traded volume, and sales growth), operating variables (ROA, ROE) and market variables (Cumulative Holding period returns) informed by theory, that significantly impact firms' decision to cross-list. By looking first at these variables at time of mainland listing for all three samples, we want to highlight the possible importance of these firm characteristics at the mainland IPO time to examine how the inherent differences at that time determine a firm's decision to cross-list. Therefore, our first logit regression models the fundamental, operating and market variables from all three samples that include mainland listed stocks and Hong Kong and ADR cross-listed stocks but after mainland IPO time and before any cross-listing has happened. Furthermore, we employ another logit model on our Hong Kong and ADR list of stocks after their cross-listing from mainland to Hong Kong stock exchange. This model is employed to examine how the firm fundamental characteristics change after their cross-listing into Hong Kong and how they differ among these samples that led ADR list of stocks to pursuit for another cross-listing into U.S. exchange. Specifically, we are interested in

looking at these variables at the time of their Hong Kong listing and how they differ and evolve over time that influence firm's decision to adopt for ADR listing. It is important to point out that our logit model focuses on firm's fundamental, operating and market variables that as highlighted in literature can provide insights into inherent differences between firms based on differences in these variables in their early lives and if the differences in these variables help us understand the motivations behind firms cross-listing decision.

Table 08a: Logit Model 1
Logit Regression on Firm's Variables Before Cross-Listing Event

Dep. Variable:		**DUMMY**	**No. Observations:**	71			
Model:		**Logit**	**Df Residuals:**	64			
Method:		**MLE**	**Df Model:**	6			
Date:		**Wed, 03 Jul 2024**	**Pseudo R-squ.:**	0.2187			
Time:		**22:41:39**	**Log-Likelihood:**	-36.439			
converged:		**TRUE**	**LL-Null:**	-46.64			
Covariance Type:		**nonrobust**	**LLR p-value:**	0.002348			
	odds ratio	**coef**	**std err**	**z**	**P>|z|**	**[0.025**	**0.975]**
LEVERAGE	0.94	-0.0595	0.079	-0.758	0.449	-0.213	0.094
FIRM SIZE	1.29	0.2529	0.094	2.698	0.007	0.069	0.437
REVENUE GROWTH	1.02	0.0181	0.011	1.579	0.114	-0.004	0.041
Avg. traded volume in billion	0.64	-0.4535	0.58	-0.782	0.434	-1.591	0.684
ROA	0.94	-0.0586	0.103	-0.568	0.57	-0.261	0.144
ROE	0.92	-0.0833	0.064	-1.304	0.192	-0.209	0.042
Mkt performance	1.27	0.2384	0.12	1.979	0.048	0.002	0.475

Table 08a presents the results of logit regression done on all three of our samples after their listing in mainland China Stock Exchange and before any cross-listing event happened. The odds ratio of greater than 1 implies positive effects of an event happening, odds ratio of 1 implies that variable has no effect on firm decision to cross-list and odds ratio below 1 implies negative relation.

Though most of the variables in our logit regression are not significant except firm size and market performance, however analysing them could still provide us some insights. First, we would analyse the significant variables, "firm size", the positive coefficient on firm size as well odds ratio >1 indicates positive impact of firm size on firm's decision to cross-list. That means larger size firms are 1.29 times or 29% more likely to consider for cross-listing compared to smaller size firms and the significance of this variable proves our hypothesis that firm that chose to cross-list are mostly large Chinese firms. Also, we see

firms that deliver good holding period returns at time of mainland listing, indicating sound growth, stability and confidence from investors are 27% more likely to cross-list and this variable is significant when tested at 5%. Furthermore, the positive, though a very low coefficient on revenue growth suggests that firms' growth at their early stages to some extent positively influences Chinese firms cross-listing decision in popular stock exchanges of the world where they can get global attention, coverage, and opportunities for growth. However, we see negative coefficients and odds ratio less than 1 for leverage, that implies firms with greater leverage in their early lives negatively impacts their cross-listing decision. Also, the negative coefficient and odds ratio less than 1 for variable "average annual trading volume" implies that Chinese firms' stocks that experience significant trading volume after their initial mainland IPO are less likely to cross-list. These results are however different then when we interpreted using standard test of means, where we noticed that Chinese firms that go for cross-listing had highest leverage and average trading volume than their counterparts even early in their lives. Furthermore, negative and closer to 0 coefficients on firms operating variables that are ROE and ROA indicate that operating performance is not a significant indicator that influences firms' decision to cross-list. Though ROE, ROA, leverage, annual trading volume and revenue growth are not significant variables.

Table 08-b: Logit Model 2
Logit Regression on Firm's Variables After Hong Kong Cross-Listing Event

Dep. Variable:		**DUMMY**	**No. Observations:**	45			
Model:		**Logit**	**Df Residuals:**	38			
Method:		**MLE**	**Df Model:**	6			
Date:		**Wed, 03 Jul 2024**	**Pseudo R-squ.:**	0.1133			
Time:		**22:46:25**	**Log-Likelihood:**	-27.647			
converged:		**TRUE**	**LL-Null:**	-31.181			
Covariance Type:		**nonrobust**	**LLR p-value:**	0.3147			
	odds ratio	**coef**	**std err**	**z**	**P>|z|**	**[0.025**	**0.975]**
LEVERAGE	1.07	0.067	0.145	0.461	0.645	-0.218	0.352
FIRM SIZE	0.96	-0.0432	0.079	-0.547	0.585	-0.198	0.112
REVENUE GROWTH	0.99	-0.0085	0.019	-0.455	0.649	-0.045	0.028
Avg. traded volume in billion	1.16	0.1514	0.477	0.317	0.751	-0.784	1.087

ROA	0.96	-0.0459	0.132	-0.348	0.728	-0.304	0.212
ROE	1.03	0.0323	0.07	0.463	0.643	-0.105	0.169
Mkt performance	1.16	0.1518	0.082	1.848	0.065	-0.009	0.313

Above are the 2nd logit regression model results done on our cross-listed samples. With this regression results, we aim to explain the effects of these variables on firms' decision to adopt for ADR listing after cross-listing on Hong Kong.

The results from our 2nd logit regression yield no statistical significance as none of the variable is significant but still, we could provide economic justification looking at the coefficients and odds-ratio of variables. The model indicates that leverage and increased trading volume of cross-listed Chinese firms in Hong Kong in fact now have a positive and influential effect on their decision to go for ADR listing. That's quite interesting and different than what we saw in our first logit regression results, where firm size, market performance were significant variables and played an important role in firms' decision to cross-list, while firms with greater leverage and higher trading volume just after their mainland IPO implied negative corelation with their decision to cross-list. However, here what we see is that Hong Kong cross-listed firms that further go for ADR listing are those that are already growing and thus they take on more leverage to expand overseas, that's why Hong Kong cross-listed Chinese firms with greater leverage are 1.07 time or 7% more likely to go for ADR listing. Similarly, Hong Kong cross-listed Chinese firms whose stocks are liquid and highly traded are 16% more likely to go for ADR listing. At this stage, increased trading volume as indicated by odds ratio of 1.16 and positive coefficient indicate that those firms that go for ADR listing have more trading volume because they have more interest from investors. Furthermore, market performance also seems to play an important role in Hong Kong's cross-listed firms' decision to go for cross-listing in U.S., and though it's not significant, it's still very close to being compared to all other variables. And it seems firm's market performance tells a lot about whether these firms will cross-list at each stage of cross-listing, that is firms that have superior market performance, generate good returns for investors, are stable, popular and large Chinese firms and therefore, more likely to cross-list in U.S. stock exchanges.
However, with coefficients closer to 0, and odds ratio closer to 1 on firm size, revenue growth, ROE and ROA, this explains that at this stage firm size does not play a decisive role on firm's decision to go for ADR as during Chinese firms' early lives, the firms that went on for Hong Kong cross-listed firms were already those that are larger firms and have greater sales growth (based on logit model 1 result). And operating performance does not seem to influence firms' decision to cross-list at any stage, in fact as we indicated in our literature review, that operating performance variables are those that get affected because of cross-listing.
The results of our logit regressions helped us examine the significance of these variables on firm's decision to cross-list and these results seem to align with

what we interpreted in literature review, that large firm size, with superior market performance are very likely those that chose to cross-list and this is further proved by the statistical significance of these variable (firm size and market performance). Also, the logit results helped us signify the importance of each variable at each stage, i.e. after listing in mainland China and after Hong Kong cross-listing. What we interpret is that after IPO in mainland China and before any cross-listing event, firm size, superior market returns, and revenue growth seemed like key determinants that can help identify between firms that will go for cross-listing in Hong Kong and those that won't. Furthermore, after Hong Kong cross-listing event, leverage, market performance and increased trading volume become significant determinants to identify between firms that would further go for ADR listing and those that won't. Moreover, looking at coefficients on operating variables in both Logit results, we can say that firm's decision to cross-list is not captured by ROA and ROE in any time-period. Even though leverage, trading volume and revenue growth are not significant at any stage of cross-listing when interpreted, the coefficients and odds ratio of these variable signify their relevance and that's why we feel it's important to interpret their economic importance. Because the economic importance of coefficients and signs of variables at each stage of cross-listing do indicate important information and align with what we discussed in our literature that in part there is something inherent to these firms at the time of their initial IPO in mainland China that determines if they would go for cross-listing. As firms that further go for listing in U.S. are those that have more leverage as they seek out to grow further in international markets and have increased trading volume that further indicates that these firms are popular Chinese companies. Moreover, positive coefficient on market performance in both logit model results indicates that firms that consistently generate good returns for investors are very likely to cross-list. Good holding period returns generally indicate stability, growth and good prospects, that's why it seems companies that go for cross-listing are already those firms that are large, seek international expansion and are popular companies.

4.2 Market Performance Test:

Does cross-listing event have an impact on market performance of cross-listed stocks?

To answer our 2nd hypothesis question, and test the mixed evidence provided in literature regarding post cross-listing valuation and market performance of Chinese cross-listed stocks, we are conducting two event studies that will benchmark our cross-listed samples, that are Hong Kong and ADR listed stocks market performance against the base case, that is mainland listed

sample of stocks. A large amount of literature work makes the case that cross-listing event effects valuation and market performance of cross-listed stocks such as Ji (2005), Foerster & Karolyi (1999), Lang, Lins, & Miller (2004), and Luo *et al.*, (2012) . Therefore, to test these claims, we find that event study methodology would be the best test here as we see wide application of event studies in field of economics, accounting & finance to test the impact of events such as IPO, M&A, issue of new debt or equity, stock splits etc., on value of the firm. In our study, our event of interest is testing the impact of cross-listing, that is the event, on Chinese cross-listed stocks market returns. That is, we are capturing the price effects of cross-listing event on cross-listed stocks, and to test the impact, we benchmark the post event returns, i.e., event window against the period prior to the event, i.e., estimation window. In our case, our event window is the three-year period post cross-listing event, with the event date being the cross-listing event date for Hong Kong and ADR cross-listed sample denoted as t=0. The reason we are using 3-year instead of 5-year event window is that majority of studies we analysed also used 3-year event window such as those by Alexander, Eun, & Janaki Ramanan (1998); Huang & Song (2005), Luo *et al.*, (2012), Mittoo (2003), Wu & Kwok (2007). Our estimation window is the 3-year period after IPO in mainland Chinese exchange before any cross-listing event. We chose the period early in firms lives that is after they do an initial listing in mainland China as the estimation window.

Sample Selection and Methodology:

The aim of our event study is to test the impact cross-listing event has on Chinese firms that go for cross-listing, hence we take the estimation period window as normal returns and to appraise the event's impact we require a measure of abnormal return that we calculate as actual returns that are returns after cross-listing event in excess of normal returns. We are focusing on market performance because a lot of literature work on cross-listings such as those by Foerster & Karolyi (1999), Lang, Lins, & Miller (2004), Luo *et al.*, (2012) focussed on benchmarking market performance of a cross-listed stock to test the impact of cross-listing. Therefore, following the approach used by Foerster and Karolyi (2000) for measuring market performance, in this study we use holding period returns as a measure of market performance. The abnormal return is the actual ex post cross-listing return of the security over the event window minus the return of market model (base case model) during the estimation window, i.e., the return that would be expected if the event did not take place. Hence, the abnormal return ϵit is any excess actual returns against market model returns. For modelling the normal return, we use mainland Chinese stocks as our market adjusted model, we give a beta of 1 for all firms, therefore, we assume stable linear relation between the market return and security return and as a result we

don't require estimation. "The market model is a statistical model that relates the return of any given security to the return of market portfolio. The model's linear specifications follow from the assumed joint normality of asset returns. In applications a broad-based index is used for the market portfolio such as S&P 500 index, CRSP value-weighted index. Since, our study is on Chinese stocks, we use a sample of Chinese A-shares stocks index as market model". The equation below shows the calculation for abnormal return, for each firm i and event date $\tau = 0$ we have.

$$E_{it} = R_{it} - R_{mt}$$

Where ϵit, is the abnormal return, $R_{it}$are the actual returns of our cross-listed samples calculated during event window period and $R_{m_t}$is the normal return, i.e., return of our market model during estimation window period.

We are working with three samples, one is mainland sample of Chinese stocks i.e., stocks that never cross-listed and their only listing is in mainland Chinese stock exchanges; this is our market model. 2nd sample is Hong Kong cross-listed stocks, stocks that were initially listed in mainland Chinese stock exchanges and later went on to cross-list in Hong Kong, and third is our ADR list of stocks, stocks that first cross-listed in Hong Kong and later went on to cross-list in U.S. stock exchanges. Average sample has 22 stocks. Therefore, we are conducting two event studies that focus on finding abnormal returns of cross-listed firms *vis-à-vis* our base case mainland sample returns.

- In the first event study, we look at firms that went on to cross-list in Hong Kong stock exchange, we are benchmarking their returns with our market model returns and calculate for any abnormal return that might exist.
- Similarly, for our next event study, we calculate ADR sample returns after they have cross-listed in U.S. stock exchange and benchmark it against our market model returns and this would tell us the excess returns if any ADR listed stocks achieve after listing in U.S. stock exchanges. It's important to note that for our ADR sample, all stocks went from mainland to cross-list in Honk Kong and then for ADR listing.

Testing Procedure:

The null hypothesis in our event study is that cross-listing event has no impact on cross-listed stock's market returns, that is abnormal returns are not significantly different from 0. To examine the impact of cross-listing event on

firm's holding period return, we calculate the deviation of the actual returns that is post cross-listing market returns from normal market model returns. It is typical for the estimation window and event window not to overlap. This design provides estimators for the parameters of normal return model which are not influenced by event-related returns. Including the event window in the estimation of the normal model parameters could result in event returns having a large influence on the normal return measure. This will be problematic since our methodology is built around the assumption that the event impact is captured by the abnormal returns. To test our hypothesis, we define our estimator for calculating expected return in the event window and introduce cumulative abnormal returns by aggregating the HPR across time and securities in order to draw inferences for the event of interest, averaging eliminates noise and gives better estimates, First, we consider aggregation through time for an individual security and then we aggregate those abnormal return across securities. We cumulate abnormal returns (CAR) to accommodate multiple sampling intervals within the event window. We then find standard deviation of the estimator across securities and then proceed to test our null at 5% significance using standardized cumulative abnormal return J1.

$$J1 = CAR_i\ (\tau_0 - \tau_2) / [\ \sigma\ (E_{it})]$$

Cumulative abnormal returns= total abnormal performance in event window

$$CAR_i = \sum_{\tau_0}^{\tau_2} AR_{it}$$

The standard deviation of the abnormal returns($\sigma\ (E_{it})$) for the market model is derived from the variance estimator, as we define

$$\text{var}^2(E_{it}) = \text{var}^2[R_{it}] - \text{var}^2[R_{mt}]$$

$$\text{var}(E_{it}) = \sigma^2(E_{it})$$

Where $\text{var}[R_{it}]$ is the sum of variances for cross-listed sample stocks calculated from 3-year event window daily returns

$\text{var}[R_{mt}]$ is the sum of variances for market model stocks calculated from estimation window period daily returns.

$\text{var}(E_{it})$ is then calculated as the difference between variances of two samples (cross-listed and market model)

Result:

Figure 02 shows the market performance for all three samples after their initial listing in mainland Chinese stock exchanges. We can see here that during estimation window period, both samples that later went on to do cross-listing outperformed domestic listed Chinese stocks i.e., our market model stocks.

Figure 02: Market Performance of Sample Stocks in Early Period

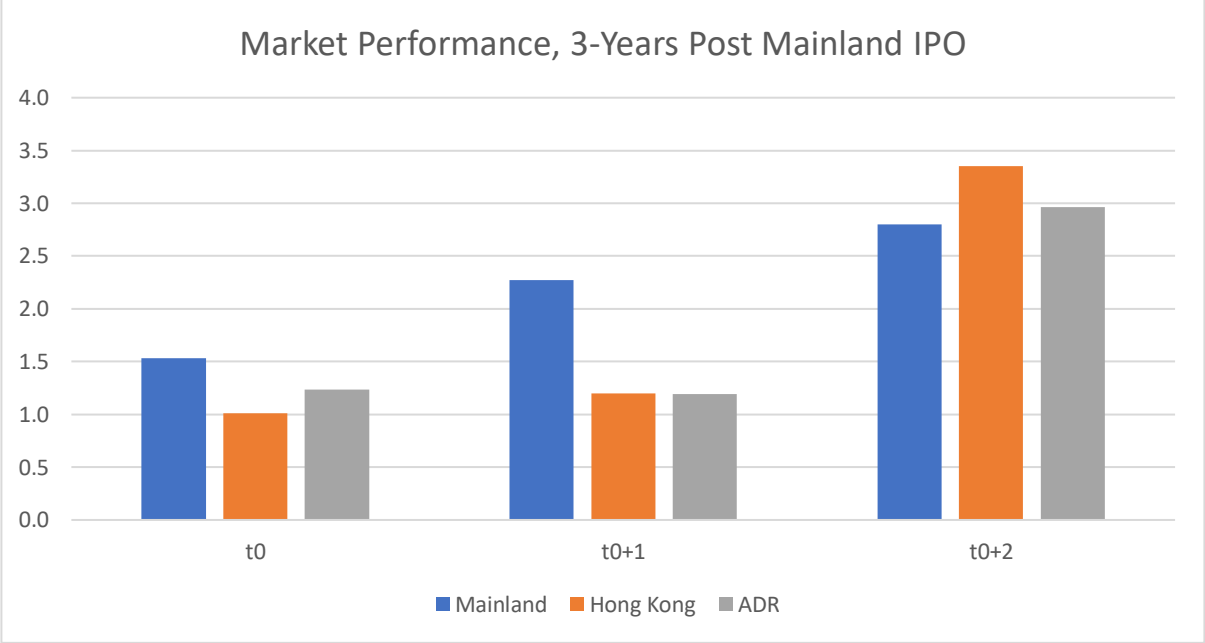


Table 05-a and table 05-b below aggregate the HPR for each sample across each event-window and estimation window year and calculate for abnormal returns by benchmarking event window returns for cross-listed samples (i.e., Hong Kong cross-listed samples and ADRs) against market model returns.

Table 09-a: Excess returns and CAR post Hong Kong cross-listing

Holding Period	Market Model Returns (%)	Hong Kong Cross-listed Sample returns (%)	ADR Cross-listed Sample returns (%) *	Abnormal Return (%) **	Abnormal Return (%) ***
HPR- AVG 1 YR AFTER LISTING	1.5	0.3	0.64	-1.24	-0.52
HPR- AVG 2 YR AFTER LISTING	2.3	-0.2	1.5	-2.46	-1.07

HPR- AVG 3 YRS AFTER LISTING	2.8	0.6	2.32	-2.2	-0.48
Cumulative 3-yr HPR (%)	6.855	0.82	3.61	-6.03 (-57)	-3.24 (-6.7)

Table 09-a presents the market model stocks returns for 3-years post IPO in mainland Chinese stock exchange and market returns for Hong Kong cross-listed sample after their cross-listing in Hong Kong stock exchange for up-to 3-years.

* Returns for ADR cross-listed sample stocks are after cross-listing in Hong Kong stock exchange

**indicates excess returns for Hong Kong cross-listed stocks post cross-listing when benchmarked against market model returns

***indicates excess returns for ADR cross-listed stocks after their cross-listing in Hong Kong when benchmarked against market model stocks returns

numbers in bracket indicate standardized J1 value.

Table 09-b: ADRs excess returns and CAR post U.S. cross-listing

Holding Period	Market Model stocks return (%)	ADR Cross-listed Sample Returns (%) *	Abnormal Return (against market model)
HPR- AVG 1 YR AFTER LISTING	1.5	0.82	-0.71
HPR- AVG 2 YR AFTER LISTING	2.3	0.72	-1.55
HPR- AVG 3 YRS AFTER LISTING	2.8	1.21	-1.59
Cumulative 3-yr HPR (%)	6.85	2.58	-4.27 (-41)

Table 09-b in column 04 and 05 presents excess returns for ADRs post cross-listing in U.S. stock exchanges when benchmarked against market model stocks returns

* Returns for ADR cross-listed sample stocks are after their cross-listing in in U.S. stock exchanges for the event-window period.

numbers in bracket indicate standardized J1 value.

In our first event study group, we analyse and benchmark after the Hong Kong cross-listing event the stock performance of our Hong Kong listed sample stocks and ADR sample stocks against mainland listed stocks. We analyse the stock performance based on holding return for up to 3-years after cross-listing date and then aggregate the returns across time and securities to calculate cumulative abnormal returns. The results we get are quite different than when we analysed the market performance for all samples after their initial mainland listing as shown in figure 02. What we see is the underperformance for both cross-listed sample stocks against our market model as can be seen by negative cumulative abnormal return for event-window period. The value of J1 is -57 for Hong Kong cross-listed sample stocks and the null that cross-listing has no impact on market performance of stocks is strongly rejected. The story is same for ADR stocks, the value of J1 is -6.7 and CAR is -3.24%. therefore, theoretically we can say that cross-listing event does impact market performance as it does impact operating performance and fundamental characteristics of firms.

In our first event study, we see ADR and Hong Kong cross- listed stocks consistently underperformed mainland counterparts during each holding year of our event study. In 2nd event study, we benchmark ADR stocks returns post cross-listing in U.S. against our market model and Hong Kong cross-listed stocks returns after their cross-listing in Hong Kong. Here too we see underperformance of ADRs against market model in each year of event period as well when measured in terms of cumulative abnormal return. All in all, we can see that our both cross-listed samples underperformed market model after cross-listing event. J1 of -41 with negative CAR of -4.27% against market model led us to strongly reject the null and we can say that cross-listing event does have an impact on cross-listed stocks market performance.

Literature on cross-listing event impact on market performance of Chinese cross-listed stocks presents mixed evidence. Some suggest it impacts positively and others such as those, with whom our results are consistent like Luo et al. (2012), Zhang and King (2010) document that Chinese cross-listed stocks underperform benchmarks in three-year period post-IPO. We find similar returns for our cross-listed sample stocks, except the magnitude of underperformance for Hong Kong cross-listed sample stocks is greater compared to ADRs as the Hong Kong cross-listed sample of stocks had a negative holding return for every year of the event window. To sum up, our findings on post cross-listing stock price performance show underperformance over the long run for Chinese issuers listing abroad. This is consistent with the results of Foerster and Karolyi (1999), using the weekly returns for 2-years around the listing dates for 183 ordinary and ADR issues; Foerster and Karolyi (1999) document on average a pre-listing run-up to abnormal returns of 10%, a

significant return of 1% during the listing week, and a 9% drop after the cross-listing. However, some studies as those by Baker, Nofsinger and Weaver (2002) argue that the status or prestige of an exchange result in increased market visibility of the firm, thus affecting positively their post cross-listing market performance and valuation. Nevertheless, there are mixed results on the market performance of Chinese cross-listed stocks but what we do notice is improvement in returns of our ADR listed stocks post cross-listing in both event studies groups and in fact if we compare the HPR of ADRs in year-3 of event study post U.S. cross-listing, we see 47.5% improvement in results. Furthermore, from our both event studies, and based on literature work done on cross-listing impact on market performance, we can say that cross-listing event does impacts market performance of cross-listed stocks.

4.3- Operating Performance Test:

Does the cross-listing in popular stock exchanges of the world such as U.S. improve the corporate governance structure of firm and hence the operating performance?

Finally, here we do an official investigation to test the claims regarding post-cross-listing operating performance of cross-listed stocks presented in theory that cross-listing in U.S. stock exchanges improves the corporate governance structure of firms from countries where investor protection mechanism is weak, there exist information asymmetries, corporate internal control mechanism, audit standards are not up to international standards that can develop sound trust between the company and its shareholders. We investigate these claims by benchmarking the operating performance variables that are ROE & ROA of ADRs against mainland listed sample of stocks, Hong Kong listed stocks, and compared ADR listed stocks operating performance before and after the cross-listing event to see how these variables improved overtime.

To test the impact of cross-listing on operating performance of cross-listed stocks, we use methodology based on mean adjusted change. We compare the unadjusted mean of operating performance variables post cross-listing for Hong Kong and ADR stocks against the domestic listed counterparts. We compute these means for up to 3-years post cross-listing and benchmark against domestic listed counterparts operating performance measured for up to 3-years after mainland IPO. As discussed in section 3, and presented in Charts 03 and 04 below, at mainland IPO time, we can see that mainland domestic listed Chinese stocks have high turnover in terms of ROA and ROE, where mean ROA for 3-years after IPO for mainland stocks is around 10% and for ROE, the 3-year post IPO average is around 18.85%. This compares to 3-year ROA mean of 5.6% and 5.8%, and 3-year ROE mean of 9.93% and 12.58% for Hong-Kong cross-listed and ADR

stocks at time of mainland IPO. The massive ROA and ROE demanded by investors for investing in domestically listed Chinese stocks can be attributed to the fact that investor's trust is low as many of these domestically listed stocks that don't cross-list are also SOE's. Also, it's interesting and valuable to know, that unlike other large markets like U.S., U.K., Chinese A-share market is largely driven by retail investors who have shorter holding period, that can create high volatility and contribute to high turnover[19]. It's fair to ask that at time of mainland IPO, Hong Kong, and ADR cross-listed were also mainland listed stocks, as investors were not aware that they will be cross-listing in future, therefore, this massive divergence in operating variable return can be a factor used to distinguish between stocks that will likely go for cross-listing and those that won't.

If we analyse the operating performance of Hong Kong and ADR sample stocks after they do cross-listing in Hong Kong, we see massive deterioration in these variables post cross-listing. Figures 03 & 04 portray the operating variables for all three sample stocks at the time of IPO in mainland Chinese stock exchanges, and Table 05 and 06 present the operating variable performance of cross-listed stocks (Hong Kong cross-listed sample and ADR sample) after each IPO period. The common and most obvious argument for the massive deterioration in these operating variables post cross-listing is that Chinese cross-listed stocks are more related to international equities profile after their cross-listing in Hog Kong or U.S., and if we see the operating performance of international benchmarks such as MSCI All Country World Index, or U.S. S&P 500 index, their trailing 10-year average ROA is 1.95 and 3.23 and trailing 10-year average ROE is 12.01 and 15.42 respectively. In contrast, ADRs and Hong Kong cross-listed stocks still fare much better in terms of ROA when compared with international benchmarks and in terms of ROE, their performance is very much in line with global equities benchmark.

Therefore, in response to our thesis question, if cross-listing improves corporate governance and in turn operating performance of ADRs, we can't really say an obvious answer, as it deteriorates sharply when benchmarked against the mainland stocks sample operating variables at mainland IPO time, but when computed against international equities benchmarks (MSCI ACWI ad S&P 500), with which Chinese ADRs should be benchmarked, one they are cross-listed in U.S., their performance is very much in line. The ROE of ADRs post ADR cross-listing is very similar to international standards, while ROA is almost double that of global equities benchmark, and about 19% more than U.S. equities benchmark S&P 500. Therefore, while post cross-listing in U.S. Chinese ADRs operating variables deteriorates when compared with mainland Chinese stocks sample, it's already high relative to international benchmarks. Furthermore, when we

[19] China A-shares: four key factors for investors | China equity market analysis and multi-asset strategy | UBS Global

compare the operating performance of ADRs with same sample data but after Hong Kong cross-listing time, we do see a marginal improvement, ROA of ADRs computed for 3-year period post ADR listing improves by 1.6% compared to post Hong Kong cross-listing performance (3.78% is ROA when averaged for 3-year period post Hong Kong cross-listing and 3.84% when measured post ADR cross-listing). Similarly, ROE of ADRs improves by around 4% post ADR cross-listing period when measured against ROE of ADRs post Hong Kong cross-listing period, that could suggest that after cross-listing in U.S. stock exchanges, Chinese ADRs corporate governance mechanism does improve that is reflected in improvement in their operating variables.

Figure 03: Return on Assets for Sample Stocks in Early Period

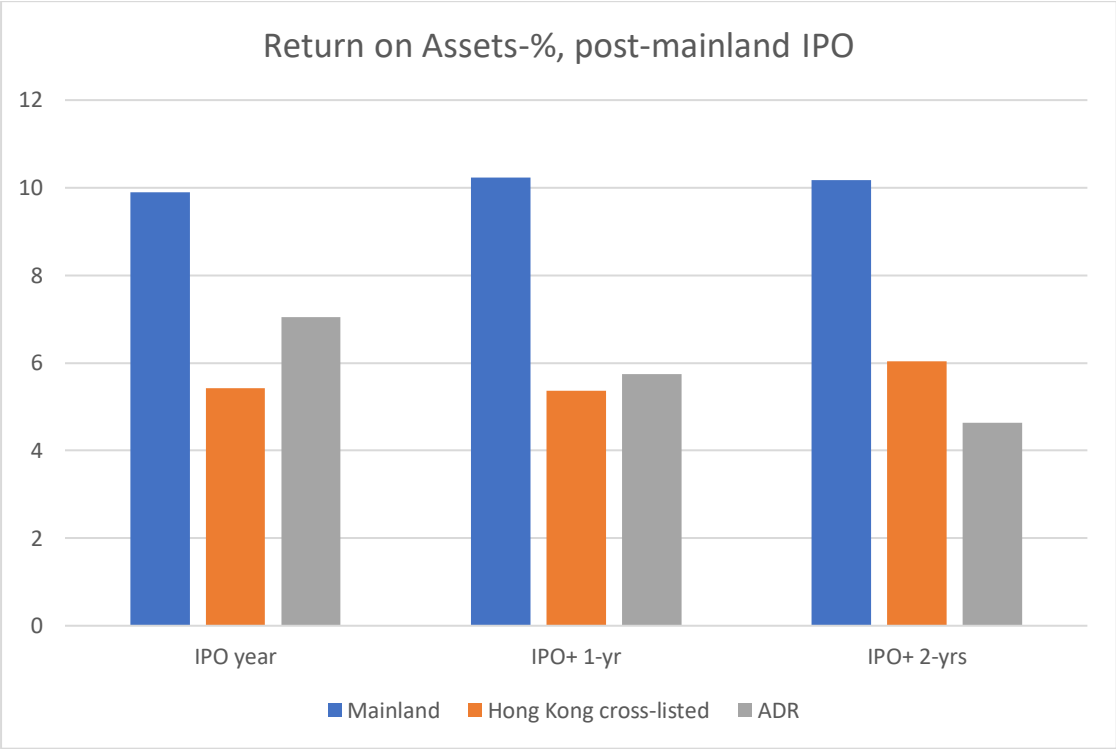
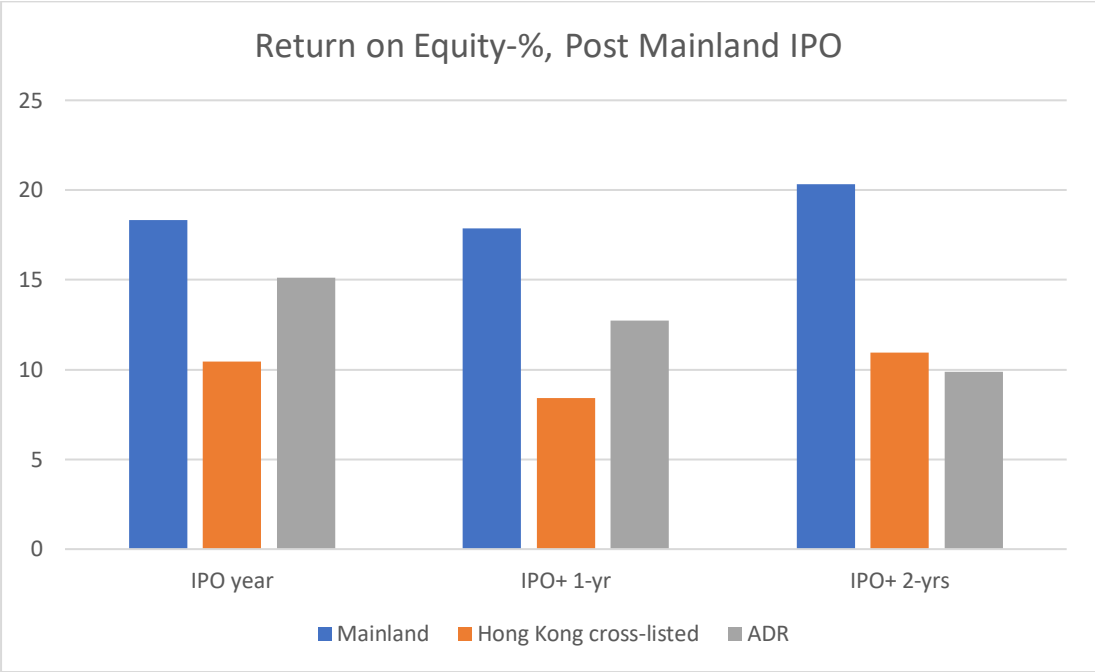


Figure 04: Return on Equity for Sample Stocks in Early Period



Figures 03 & 04 depict the ROA and ROE for all three during their early lives, i.e., at time of mainland IPO.

Table 10-a: Operating Performance Comparison Post Cross-Listing for Hong Kong Cross-listed Sample

ROA-Hong Kong cross-listed Sample	Post Mainland Listing %	Post Hong Kong Cross-listing %	%change after cross-listing in Hong Kong*	MSCI ACWI ROA**	S&P 500 ROA**
IPO year-T0	5.43	5.57	2.58%	1.95	3.23
T0+1	5.37	4.57	-14.9%		
T0+2	6.04	2.93	-52.5%		
3-year average	5.61	4.35	-22.5%		

Table 10-b:

ROE-Hong Kong cross-listed Sample	Post Mainland Listing %	Post Hong Kong Cross-listing %	%change after cross-listing in Hong Kong*	MSCI ACWI ROE**	S&P 500 ROE**
IPO year-T0	10.44	11.763	12.67%	12.01	15.42
T0+1	8.41	9.94	18.19%		
T0+2	10.94	8.11	-25.86%		
3-year average	9.93	9.94	0.1%		

*Represents change when computed against mainland performance.

**trailing 10-year average values

Table 11-a: Operating Performance Comparison Post Cross-listing for ADR Cross-listed sample

ROA-ADR Sample	Post Mainland Listing %	Post Hong Kong Cross-listing %	Post ADR listing %	%change after cross-listing in Hong Kong*	% change after ADR cross-listing**	MSCI ACWI ROA***	S&P 500 ROA***
IPO year-T0	7.04	4.32	4.11	-38.64%	-4.9%	1.95	3.23
T0+1	5.76	4.01	4.51`	-30.38%	12.5%		
T0+2	4.64	3.02	2.9	-34.91%	-4.0%		
Cumulative 3-year average	5.81	3.78	3.84	-35%	1.6%		

Table 11-b:

ROE-ADR Sample	Post Mainland Listing %	Post Hong Kong Cross-listing %	Post ADR listing %	%change after cross-listing in Hong Kong*	% change after ADR cross-listing**	MSCI ACWI ROE***	S&P 500 ROE***
IPO year-T0	15.12	12.88	13.21	-14.8%	2.56%	12.01	15.42
T0+1	12.73	12.19	13.58	-4.24%	11.4%		
T0+2	9.90	11.21	10.84	13.23%	-3.30%		
Cumulative 3-year average	12.58	12.09	12.54	-3.9%	3.72%		

*Represents change when computed against performance at mainland IPO time.

** Represents change when computed against performance post Hong Kong cross-listing.

***trailing 10-year average values

CHAPTER 05: CRITIQUE, LIMITATIONS & CONCLUSION

Limitations & Weaknesses:

There are some constraints that limited the scope of our study and importance of our results. First, in our logit model, results though helpful but many variables are not significant when tested for statical significance, therefore where we could interpret the economic importance and relevance of many characteristics in influencing Chinese firm's decision to cross-list in U.S. stock exchanges, statistically we could not prove it. Moreover, the tstat (J1) in our event study is a very large and a negative value, though we reject the null and it indicates that there is a large difference between price returns of cross-listed socks post cross-listing and before cross-listing, in other words cross-listing event does have an impact on price returns of stocks post cross-listing, but a very high t-stat could also indicate other issues such as multicollinearity. Lastly, the likes of most popular Chinese ADRs such as Baidu, Alibaba, NetEase etc. adopted VIE structure for cross-listing, therefore we could not include them in our study, as they didn't choose the traditional method of listing in mainland China or Hong Kong and then go for cross-listing in U.S.

Conclusion:

This study contributes to the literature on the motives behind Chinese companies' decision to list abroad by examining the ex-ante predictors stemming from various hypothesis. Similar to Pagano et al. (2002), we explore the possible motivations for listing abroad and a set of firm characteristics that influence firm's decision. For our study, we work with 3 sample of stocks, ADR sample consist of Chinese stocks that did Hong Kong listing and then moved to list in U.S. exchange. Our sample of mainland stocks are those that only ever did an IPO in mainland Shanghai and Shenzhen stock exchanges, and finally Hong Kong cross-listed sample consist of stocks that have a mainland listing and then later in their life moved on for a listing in Hong Kong stock exchange. We therefore examine those firm characteristics that we believe are most likely to influence firm's decision to list abroad and examine the differences between those variables among samples under observation at each stage i.e., at time of mainland listing among all three sample and after cross-listing in Hong Kong among Hong Kong cross-listed sample and ADR sample of stocks. For our study, we chose to work particularly on ADRs because U.S. had been the most popular destination in last two decades or so, where Chinese firms cross-listed. What we find from our results is that stocks that chose to cross-list are most likely those that are large firms and already deliver solid market performance,

as these variables are statically significant. Furthermore, we also find that stocks that chose to cross-list in U.S. stock exchanges i.e., ADR sample stocks are highly levered compared to mainland and Hong Kong cross-listed counterparts, revenue growth of ADR firms in this sample is highest too, and these firms' stocks are heavily traded compared to mainland and Hong Kong cross-listed sample stocks, though these variables are not significant in our logit regression, but their coefficients and odds ratio provide valuable information about their relevance. That can explain the facts that we discussed in literature that Chinese stocks that go for cross-listing in popular stock exchanges of the world such as in U.S. are those experiencing high growth, are large firms that need to expand and reach global audience, and their market performance is solid.

However, our findings on post cross-listing stock price performance show underperformance over the long run for Chinese issuers listing abroad and looking at the event study results we conducted to test market performance, we can strongly reject the null and say that cross-listing event does have an impact on cross-listed stocks market performance. Also, our findings are consistent with the results of Foerster and Karolyi (1999) who document on average a 9% drop in stock performance of cross-listed stocks after the cross-listing. Furthermore, in terms of operating performance, we see ADR sample stocks operating performance deteriorating post cross-listing in U.S. when benchmarked against the mainland Chinese stocks sample operating variables, however, we find that the operating performance is very much in line with the international standards. Finally, though, literature on post cross-listing market performance of stocks presents mixed evidence, our study helped investigate and provide evidence of key reasons and motivations that may influence Chinese firm's decision to cross-list in U.S. stock exchanges and we can confidently say that U.S. remains the most popular destination for Chinese stocks to cross-list even today.

6- Bibliography:

Coffee, J.C. (1999) 'The Future as History: The prospects for global convergence in corporate governance and its implications,' *Social Science Research Network*, (93), pp. 641–708. https://doi.org/10.2139/ssrn.142833.

Doidge, C., Karolyi, G.A. and Stulz, R.M. (2004) 'Why are foreign firms listed in the U.S. worth more?' *Journal of Financial Economics*, 71(2), pp. 205–238. https://doi.org/10.1016/s0304-405x(03)00183-1.

Fama, E.F. and French, K.R. (1992) 'The Cross-Section of expected stock returns,' *The Journal of Finance*, 47(2), pp. 427-465. https://doi.org/10.1111/j.1540-6261.1992.tb04398.x.

Fama, E.F. and French, K.R. (1993) 'Common risk factors in the returns on stocks and bonds,' *Journal of Financial Economics*, 33(1), pp. 3–56. https://doi.org/10.1016/0304-405x(93)90023-5.

Fama, E.F. (1997) 'Market efficiency, Long-Term returns, and behavioural finance,' *Journal of Financial Economics*, 49(3), 293-306. https://doi.org/10.1016/S0304-405x(98)00026-9.

Foerster, S.R. and Karolyi, G.A. (1999) 'The Effects of Market Segmentation and Investor Recognition on Asset Prices: Evidence from Foreign Stocks Listing in the United States,' *Journal of Finance*, 54(3), 981-1013. https://doi.org/10.1111/0022-1082.00134.

Geranio, M. (2012) 'Cross-listing and the evolution of global stock market liquidity,' *in Edward Elgar Publishing eBooks* https://doi.org/10.4337/9780857938183.00019.

Guluma, T.F. (2021) 'The impact of corporate governance measures on firm performance: the influences of managerial overconfidence,' *Future Business Journal*, 7(1). https://doi.org/10.1186/s43093-021-00093-6.

Hail, L., and C. Leuz (2005) 'Cost of capital and cash flow effects of U.S. cross-listings,' *Journal of Financial Economics*, 93(3): 428-454. https://api.semanticscholar.org/CorpusID:166659528.

Baker, H.K., Nofsinger, J.R. and Weaver, D.G. (2002) 'International Cross-Listing and visibility,' *Journal of Financial and Quantitative Analysis*, 37(3), p. 495. https://doi.org/10.2307/3594990.

Huang, G., & Song, F.M. (2005). 'The financial and operating performance of China's newly listed H-firms,' *Pacific-Basin Finance Journal*, 13(1), p.53-80

Jensen, M.C. (1999). 'Agency cost of free cash flow, corporate finance, and takeovers,' *American Economic Review*, 76(2), 323-329. https://doi.org/10.2139/ssrn.99580.

Cai, J. and Zhang, Z. (2011) 'Leverage change, debt overhang, and stock prices,' *Journal of Corporate Finance*, 17(3), pp. 391-402. https://doi.org/10.1016/j.jcorpfin.2010.12.003.

Ji, A.G. (2005). 'Cross-listing and firm-value corporate governance or market segmentation? An empirical study of the stock market,' *Social Science Research Network.* https://doi.org/10.2139/ssrn.1002902.

Jing, Liu, Doron, Nisim, and Jacob, Thomas; 'Equity Valuation Using Multiples,' *Journal of Accounting Research*, Vol. 40 No. 1, March 2002, Printed in U.S.A.

Kang, Tony and Hope, Ole-Kristian (2004), 'The Bonding Hypothesis revisited: Do Cross-Listing Firms Bond to the improved disclosure environment in the United States,' *Research Gate*. (PDF) The Bonding Hypothesis Revisited: Do Cross-Listing Firms Bond to the Improved Disclosure Environment in the United States? (researchgate.net)

Keats, B.W., & Hitt, M.A. (1988). 'A casual model of linkages among environmental dimensions, macro-organizational characteristics, and performance,' Academy *of Management Journal*, 31(3), 570-598. https://doi.org/ 10.2307/256460.

Khurana, I.., Martin, X., & Periera, R. (2008) 'Cross-listing and firm growth,' *Review of Finance,* 12(2), 293-322. https://doi.org/10.1093/rof/rfm031.

King, M.R., & Segal, D. (2009). 'The long-term effects of cross-listing, investor recognition, and ownership structure on valuation,' *Review of Financial Studies,* 22(6), 2393-2421. https://doi.org/10.1093/rfs/hhn050.

Korczak, P., & Bohl, M.T. (2005). 'Empirical evidence on cross-listed of stocks of Central and Eastern European companies,' *Emerging Markets Review,* 6(2), 121-137. Https://doi.org/10.1016/j.ememar.2004.11.001.

Lau, S.T., Lee, C.T., & McInish, T.H. (2002). 'Stock returns and beta, firms' size, E/P, CF/p, book-to-market, and sales growth: Evidence from Singapore and Malaysia,' *Journal of multinational financial management,* 12(3), 207-222. Https://doi.org/10.1016/s1402-444X(01)00051-2.

Lang, M., K. V. Lins, and D. P. Miller (2003), 'ADRs, analysts, and accuracy: Does cross-listing in the United States improve a firm's information environment and increase market value?' *Journal of Accounting Research*, 41 (2), 317-345.

Lang, M., K. V. Lins, and D. P. Miller (2004), 'Concentrated control, analyst following, and valuation: Do analysts matter most when investors are protected least?' *Journal of Accounting Research,* 42(3), 589-623. https://doi.org/10.1111/j.1475-679X.2004.t01-1-00142.x.

Lang, M.H., & Lundholm, R.J. (1996). 'Corporate disclosure policy and analyst behaviour,'. *Accounting Review,* 71(4), 467-492. https://www.jstor.org/stable/248567.

Gu, L. and Reed, W.R. (2013) 'Information asymmetry, market segmentation, and cross-listing: Implications for event study methodology,' *Journal of Asian Economics*, 28, pp. 28–40. https://doi.org/10.1016/j.asieco.2013.04.009.

Luo, Y., Fang, F. and Esqueda, O.A. (2012) 'The overseas listing puzzle: Post-IPO performance of Chinese stocks and ADRs in the U.S. market,' *Journal of Multinational Financial Management*, 22(5), pp, 193-211. https://doi.org/10.1016/j.mulfin.2012.06.008.

Luo, Y., & Jackson, D. (2011). 'Executive compensation, ownership structure and firm performance in Chinese financial corporations,' *Global business and Finance Review*, 17(1), 56-74. https://doi.org/10.2139/ssrn.1893554.

Loughran, T. & Ritter, J.R. (1995). 'The new issues puzzle,' *Journal of Finance,* 50(1), 23-51. https://Doi.org/10.2307/232938.

Merton, R.C. (1987), 'A Simple Model of Capital Market Equilibrium with Incomplete Information', *The Journal of Finance*, 42(3), pp. 483–510. https://doi.org/10.1111/j.1540-6261.1987.tb04565.x.

Peng, M.W. and Blevins, D.P. (2012) 'Why do Chinese firms Cross-List in the United States?,' in *Palgrave Macmillan UK eBooks*, pp. 249–265. https://doi.org/10.1057/9781137029560_12.

Miller, D. (1999) 'The market reaction to international cross-listings: evidence from Depositary Receipts,' *Journal of Financial Economics*, 51(1), pp. 103–123. https://doi.org/10.1016/s0304-405x(98)00045-2.

Mitchell, M.L., & Stafford, E. (2000) 'Managerial decisions and long-term stock price performance,' *Journal of Business*, 73(3), 287-329. https://doi.org/10.1086/209645.

Ng, Y.H., Yong, H.H.A. and Faff, R. (2012) 'The long- and short-run financial impacts of cross listing on Australian firms,' *Australian Journal of Management*, 38(1), pp. 81–98. https://doi.org/10.1177/0312896212437622.

Ozdagli, A.K. (2012). 'Financial Leverage, corporate investment, and stock returns,' *Review of Financial Studies*, 25(4), 1033-1069. https://doi.org/10.1093/rfs/hhr145.

Pagano, M., Röell, A.A., & Zechner, J. (2002). 'The geography of equity listing: Why do companies list abroad?,' *Journal of Finance,* 57(6), 2651-2694. https://doi.org/10.1111/1540-6261.00509.

Pratt, J.D. (2010). 'Selection of regions for entrepreneurship: An application of the CAPM,' *Academy of Entrepreneurship Journal,* 16(2), 87. https://www.questia.com/library/journal/1G1-243043159/selection-of-regions-for-entrepreneurship-an-application.

Segal, Troy (2021). 'China-A shares Definition', *Investopedia.* China A-Shares: Definition, History, Vs. B-Shares (investopedia.com).

Stephen R., Foerster and G. Andrew, Karolyi, 'The Effects of Market Segmentation, and Investor Recognition on Asset Prices: Evidence from Foreign Stocks Listing in the United States,' *Journal of Finance*, 1999, vol. 54, issue 3, 981-1013. https://doi.org/10.1111/0022-1082.00134.

Vaihekoski, M. (2004) 'Portfolio construction for tests of asset pricing models,' *Financial Markets, Institutions & Instruments*, 13(1), pp. 1–39. https://doi.org/10.1111/j.0963-8008.2004.0001.x.

Valero, M., & Melvin, M. (2009). 'The dark side of international cross-listing: effects on rival firms at home,' *European financial management,* 15(1), 66-91. https://doi.org/10.1111/j.1468-036X.2008.00449.x.

Simon Luk (2009). 'ADRs for listed Asian and Chinese companies: first road to the U.S. equity markets,' *Winston & Straw LLP.* ADRs for listed Asian and Chinese companies: first road to the U.S. equity markets - Lexology.

Wu, C., & Kwok, C.C. (2007). 'Long-run performance of global versus domestic initial public offerings,' *Journal of Banking and Finance,* 31(3), 609-627. https://doi.org/10.1016/j.jbankfin.2006.01.013.

Zhou, J., Zhang, T., & Cui, S. (2011). 'Cross-listing, corporate governance and corporate performance,' *Nankai Business Review International,* 2(3), 275-288. https://doi.org/10.1108/20408741111155299.

7- APPENDIX:

Calculations:

- *Holding period return* is calculated on monthly basis as

(return of current month-previous month's return)/previous month return

- *Cumulative abnormal return (*CAR) is calculated as geometric mean of three-year holding period returns in observation.
- For calculating *standard deviation*, we calculated daily returns for period under observation, and then using daily returns we calculate standard deviation for period under observation.
- The variance and the standard deviation of the abnormal returns for the market model is defined as:

$\text{Var(Eit)} = \text{Var}[R_{it}] - \text{Var}[R_{m_t}]$

$\sigma^2(E_{it}) = \sigma^2[R_{it}] - \sigma^2[R_{mt}]$

Python Script:

Uploading libraries:

```
import numpy as np
import pandas as pd
from datetime import datetime
```

Uploading data sheets:

```
df1=pd.read_excel(io='Hongkongsample_new.xlsx',sheet_name='Fundamentals
_HKG',na_values='na',index_col=0)
print(df1)

df3=pd.read_excel(io='mainland_updated.xlsx',sheet_name='fundamentals',na_
values='na',index_col=0)
print(df3)

df4=pd.read_excel(io='ADRsample_updated.xlsx',sheet_name='ADR',na_value
s='na',index_col=0)
print(df4)
```

Winaorizing all variables:

```
from scipy.stats.mstats import winsorize
```

```
df2=winsorize(df3['Leverage'], limits=[0.01, 0.01], inplace = True,
nan_policy='omit')


df0=winsorize(df1['ROE'], limits=[0.01, 0.01], inplace = True,
nan_policy='omit')

pd.DataFrame(df0).to_clipboard().  ‘copying winsorized data to excel sheets
```

Logit model

```
import statsmodels.api as sm

x=df[['LEVERAGE', 'FIRM SIZE', 'REVENUE GROWTH', 'Avg. traded
volume in billion','ROA', 'ROE', 'Mkt performance']]
y=df.DUMMY
x = x[~np.isnan(x)]
print (x)
model = sm.Logit(y,x)
result = model.fit()
result.summary()
```